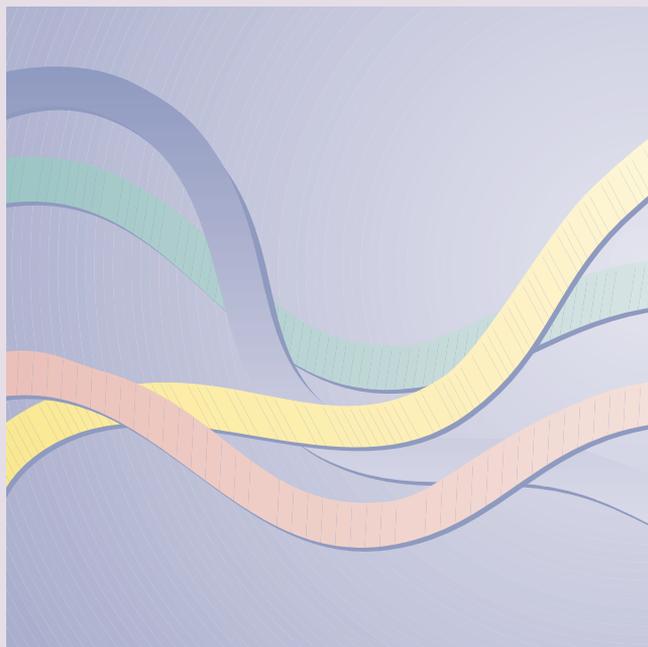


28. VOLKSWIRTSCHAFTLICHE TAGUNG 2000

Das neue Millennium –
Zeit für ein neues
ökonomisches Paradigma?



INHALT

KLAUS LIEBSCHER	
Tagungseröffnung	4
<i>Herausforderungen für die Geldpolitik des Eurosystems, Podiumsdiskussion</i>	
KLAUS LIEBSCHER, MODERATION	12
URBAN BÄCKSTRÖM	
The inflation targeting approach	17
J. ALFRED BROADDUS JR.	
Current challenges for U.S. monetary policy	21
FRANCO BRUNI	
Financial stability policies as challenges for modern central banking	26
IWAO KURODA	
Monetary policy in the new millennium – a Japanese perspective	37
ALLAN H. MELTZER	
The “New Economy” in the 1920s and the 1990s	42
JØRGEN ELMESKOV	
New sources of economic growth in Europe?	56
TIMO J. HÄMÄLÄINEN	
Catching up and forging ahead: explaining the postwar growth experience in Finland	88
JØRGEN BIRK MORTENSEN	
Comments on Jørgen Elmeskov and Stefano Scarpetta: New sources of economic growth in Europe?	98
WOLFGANG POLT	
Austria – a case for a new economic paradigm?	108
VICENTE SALAS FUMÁS	
The growth prospects of the Spanish economy	128
<i>Technologischer Wandel, Aktienmärkte und Firmenbewertung, Podiumsdiskussion</i>	
GERTRUDE TUMPEL-GUGERELL, MODERATION	
Challenges for economic policy from the perspective of a central bank	140
CLAUS J. RAIDL	
Financial markets: technological changes, stock markets and the evaluation of firms	144
JOE ROONEY	
The ageing of the New Paradigm	147
ANDREAS TREICHL	155
STEFAN K. ZAPOTOCKY	
Zur Positionierung der Wiener Börse AG im Neuemissionsgeschäft	159
JOSEF ZECHNER	
Technological change and firms’ choices of stock markets	164

KARL-HEINZ GRASSER	
Aktuelle österreichische Finanz- und Wirtschaftspolitik im europäischen Zusammenhang	172
WOLFGANG SCHÜSSEL	
Kamingepräch: Aktuelle Fragen der Wirtschaftspolitik	180
BERNHARD FELDERER	
Why do long-term economic trends in the U.S. differ from those in Europe?	188
ROBERT J. GORDON	
Does the “new economy” measure up to the great invention of the past?	198
FRANK BROWNE	
Discussing the papers of Gordon and Felderer	208
<i>Herausforderungen für die Wirtschaftspolitik, Podiumsdiskussion</i>	
HELMUT KRAMER	
New challenges for economic policy	220
PEDRO SOLBES MIRA	
Challenges for economic policies	224
SHIGEMITSU SUGISAKI	
The challenges to economic policy	229
GEORG WINCKLER	
Universities and innovations system: The case of Austria	234
Franz-Weninger-Stipendien	240
Die Vortragenden	242

KLAUS LIEBSCHER



Tagungs- eröffnung

Meine sehr geehrten Damen und Herren!

Ich heiße Sie zur diesjährigen, 28. Volkswirtschaftlichen Tagung der Oesterreichischen Nationalbank herzlich willkommen. Als wir vor mehr als einem halben Jahr das Thema dieser Konferenz „Das neue Millennium – Zeit für ein neues ökonomisches Paradigma?“ festlegten, hatten wir – offen gesagt – nicht geahnt, welche Dynamik der Diskurs über einen möglichen wirtschaftlichen Regimewechsel zu einer New Economy zwischenzeitlich entwickeln würde. Nun, wenn man die gegenwärtige Diskussion in den Medien, in diversen internationalen Foren zur Wirtschaftspolitik sowie auch die jüngsten Initiativen und Äußerungen von Wirtschaftspolitikern und Zentralbankvertretern verfolgt, scheint es, dass wir mit der Wahl unseres Themas richtig gelegen sind.

Wir befinden uns zurzeit weltweit am Schnittpunkt zahlreicher paralleler, sich gegenseitig beeinflussender Entwicklungen, welche die traditionellen wirtschaftlichen Zusammenhänge fundamental ändern.

Die *Globalisierung* bewirkt eine immer stärkere internationale Vernetzung der nationalen Volkswirtschaften und einen intensiveren Wettbewerb für immer größere Bereiche vormals geschützter Wirtschaftssektoren. International *liberalisierte Kapitalmärkte* und neue Finanzierungsformen erleichtern innovativen, dynamischen Unternehmen die wirtschaftliche Expansion.

Rasante Fortschritte im Bereich der *Informations- und Kommunikationstechnologie* verändern unsere Arbeits-



abläufe und die Organisation unserer Marktwirtschaften grundlegend. Die Effizienz und Anpassungsfähigkeit der Güter-, Dienstleistungs-, Arbeits- und Kapitalmärkte werden dadurch wesentlich erhöht.

Aber auch die *Wirtschaftspolitik* hat sich im letzten Jahrzehnt grundlegend gewandelt:

- Nach der „great inflation“ der Siebzigerjahre und der „Stagflation“ der frühen Achtzigerjahre hat sich ab der zweiten Hälfte der Achtzigerjahre als Konsens herausgebildet, dass die Geldpolitik durch unabhängige Notenbanken dem vorrangigen Ziel der Preisstabilität verpflichtet sein soll. Die daraus resultierende Antiinflationpolitik der Zentralbanken hat bewirkt, dass in allen westlichen Industriestaaten heute die Inflation so niedrig ist, dass preisverzerrende und unsoziale Auswirkungen der Inflation vermieden werden.

- Die staatliche Haushaltspolitik hat nach den Budgetdefiziten der Siebziger- und Achtzigerjahre etwa ab Mitte der Neunzigerjahre eine Rückkehr zu ausgeglichenen Budgets angetreten. Mittelfristig, über den Konjunkturzyklus ausgeglichene Staatshaushalte wurden als explizites Ziel der Budgetpolitik formuliert, verbunden mit der Forderung nach einer Rückführung der akkumulierten Schulden und einer Redimensionierung des Staates.

- Schließlich wurde gleichzeitig die Bedeutung der Eigendynamik der Wirtschaft betont. Die Notwendigkeit flexibler Güter- und Arbeitsmärkte wurde als unabdingbar erkannt, um rasche Anpassungen an geänderte Rahmenbedingungen zu ermöglichen und um das produktive Potenzial der Wirtschaft – einschließlich der Arbeitslosen – besser zu nutzen.

Diese Änderungen wurden bereits vor vielen Jahren eingeleitet. Die nunmehrige Wachstumsdynamik, die wir seit geraumer Zeit insbesondere in den USA erleben, dürfte das Ergebnis dieses langen Reformprozesses sein. Gute Wirtschaftspolitik trägt oft erst sehr langfristig Früchte.

Auch Europa hat im letzten Jahrzehnt erhebliche Anstrengungen unternommen, um international wettbewerbsfähiger zu werden und sein Wachstumspotenzial zu erhöhen. Das Binnenmarktprogramm, Europas aktive Rolle bei der internationalen Liberalisierung der Kapital-, Güter- und Dienstleistungsmärkte, die Schaffung der Wirtschafts- und Währungsunion sowie die schrittweise Erweiterung der Europäischen Union – alle diese Schritte münden in einer Intensivierung des Wettbewerbs und in einer

Erhöhung des langfristigen Wachstumspotenzials.

Die Frage, die sich nun erhebt, ist, welche weiteren Schritte erforderlich sind, damit Europa den vollen Nutzen aus diesen vereinten Anstrengungen in der neuen Ära der Informations- und Kommunikationsrevolution ziehen kann. Während in den Vereinigten Staaten das Lager jener Ökonomen, die eine New Economy diagnostizieren, stetig wächst (und auch die Notenbank einschließt), herrscht hingegen weitgehende Übereinstimmung darüber, dass in Europa bislang nur bescheidene Anzeichen für eine New Economy auszumachen sind. Ich glaube aber, dass eine abschließende Beurteilung dieser Fragen derzeit weder für die USA noch für Europa möglich ist.

Zahlreiche Fragen sind in diesem Zusammenhang noch offen.

- Die erste Frage ist, ob es eine New Economy überhaupt gibt. Auch die Definition der New Economy scheint – wenn man die Fachdiskussion verfolgt – keineswegs geklärt. Wie aussagekräftig sind in diesem Zusammenhang Statistiken zur Produktivitätsentwicklung, welche Rolle spielen Datenverzerrungen?
- Der zweite Fragenkomplex betrifft die zeitliche Dimension des Phänomens. Falls es tatsächlich eine Beschleunigung des Produktivitätswachstums infolge neuer Informations- und Kommunikationstechnologien gibt, ist das Phänomen nur vorübergehend oder länger andauernder Natur? Mit anderen Worten: Wie viel weiteres Rationalisierungspotenzial birgt die Verwendung der modernen Informations- und Kommunikationstechnologien noch? Inwieweit unterscheidet sich die Internet-

Revolution von anderen technischen Innovationsschüben der Vergangenheit?

- Die dritte Frage, die sich insbesondere für Europäer aufdrängt, ist, ob die New Economy tatsächlich, wie von den Finanzmärkten unterstellt, auf die USA konzentriert ist oder ob sie in Europa beobachtbar ist oder zumindest denkbar wäre. Wie stark sind die Unterschiede der Wirtschaftsentwicklung zwischen den USA und Europa tatsächlich? Welche Rolle spielen grundlegende strukturelle Unterschiede der Wirtschaftsstrukturen, und inwieweit besteht nur eine zeitliche Verschiebung zwischen den USA und Europa?

- Viertens erhebt sich für die Wirtschaftspolitik die Frage: Welche sind die Quellen, die auslösenden Faktoren für die neue Wachstumsdynamik, und wie kann die Wirtschaftspolitik unterstützend wirken? Welche Rolle spielt sie dabei überhaupt? Wie ist die Gewichtung zwischen Strukturreformen und geeigneter Makropolitik? Welche Rolle spielt insbesondere eine stabilitätsorientierte Fiskalpolitik bei einem schlanken Staat? Wie soll die Geldpolitik am besten gestaltet werden?

Es wäre vermessen und unrealistisch, von dieser Konferenz abschließende Antworten auf diese Fülle komplexer Fragen zu erwarten. Wir haben uns jedoch bemüht, wie in der Vergangenheit Zentralbanker, Wissenschaftler, Politiker und ihre Berater sowie Praktiker aus Wirtschaft und Bankenwesen – sowohl aus Österreich als auch aus



dem Ausland – hier zusammenzubringen, um diese für unsere Zukunft höchst relevanten Fragen zu diskutieren und neue Erkenntnisse zu gewinnen.

Wir haben das Programm unserer eineinhalbtägigen Konferenz in fünf Blöcke gegliedert:

- Der erste Themenbereich geht gleich in medias res aus Notenbanksicht und behandelt in Form einer Podiumsdiskussion die Herausforderungen für die Geldpolitik, die sich aus einem wirtschaftlichen Paradigmenwechsel ergeben könnten.
- Der zweite Schwerpunkt wird sich mit der alle Europäer interessierenden Frage auseinandersetzen, ob auch Europa neue Quellen des Wirtschaftswachstums erschließen kann.
- Der anschließende dritte Themenkomplex wird den Zusammenhang zwischen technologischem Wandel, Aktienmärkten und Firmenbewertung beleuchten.
- Die vierte Session wird die Frage erörtern, ob sich durch den technologischen Wandel grund-

legende Änderungen für die Inflationsmechanismen ergeben.

- Und im fünften und letzten Themenkreis schließt sich der Kreis der Konferenz, indem – in Form einer Podiumsdiskussion – wieder die Herausforderungen für die allgemeine Wirtschaftspolitik herausgearbeitet werden.

Ich glaube, es ist uns wieder gelungen, zu diesen Themenbereichen sehr renommierte und kompetente Vortragende zu gewinnen, die genügend Impulse für vertiefende Fragen und anregende Diskussionen bieten werden. Ich danke bereits an dieser Stelle unseren Vortragenden und Moderatoren sowie allen Diskutanten sehr herzlich für ihre Bereitschaft, ihre Gedanken mit uns zu teilen und damit die 28. Volkswirtschaftliche Tagung der Oesterreichischen Nationalbank zu bereichern.

Ich wünsche Ihnen, sehr geehrte Damen und Herren, einen interessanten Tagungsverlauf und im Besonderen unseren ausländischen Gästen, dass sie am Rande der Tagung auch die gastfreundliche Atmosphäre Wiens kennen lernen. 



KLAUS LIEBSCHER, MODERATION
URBAN BÄCKSTRÖM
J. ALFRED BROADDUS, JR.
FRANCO BRUNI
IWAO KURODA



Herausforderungen
für die Geldpolitik
des Eurosystems

Podiumsdiskussion

Zentralbanker sind ständig damit konfrontiert, Entscheidungen unter Unsicherheit zu treffen; dies ist ein zentraler Aspekt der Daseinsberechtigung von Notenbanken. Das Eurosystem – zusammengesetzt aus der EZB und den nationalen Zentralbanken der Staaten des Euroraums – hat sich mit der Umstellung auf die Wirtschafts- und Währungsunion (WWU) und mit der Geldpolitik, die es in den ersten ein- einhalb Jahren seit Schaffung des Euroraums verfolgt hat, auf un-



bekanntes Terrain begeben und diesen Test, wie ich meine, glänzend bestanden. Der Übergang zur WWU stellt einen bedeutenden Wechsel im geldpolitischen Regime dar, in dessen Zusammenhang sich die Notenbanken mit einer ganzen Reihe von Unsicherheitsfaktoren konfrontiert sehen – etwa in Bezug auf das statistische Zahlenmaterial, den WWU-weiten geldpolitischen Transmissionsmechanismus, die sich angesichts des gestiegenen Wettbewerbsdrucks ändernde Wirtschaftsstruktur des Euroraums sowie – nicht zuletzt – in Bezug auf das Zusammenspiel der wirtschaftspolitischen Entscheidungsträger.

Wir diskutieren hier über die potenziell weit reichenden Verschiebungen, die wir heute in Wirtschaftszusammenhängen beobachten, welche sich über lange Jahre herausgebildet haben. Dieser Umbruch wurde durch den Vormarsch der so genannten New Economy, also einer neuen wirtschaftlichen

Ära, ausgelöst. Es gibt zwar noch keine allgemein akzeptierte Definition dafür, aber meiner Meinung nach wäre es sinnvoll, die New Economy als Inbegriff von zwei verschiedenen Entwicklungen darzustellen.

Die *eine* Entwicklung ist, dass das Potenzialwachstum auf Grund der gestiegenen Faktorproduktivität größer geworden ist. Die höhere Faktorproduktivität ist in erster Linie auf die Revolution in der Informations- und Kommunikationstechnologie zurückzuführen. Die *andere* Entwicklung ist ein Rückgang der strukturellen und friktionellen Arbeitslosigkeit, wobei dieser Rückgang wiederum zum Teil der Revolution in der Informations- und Kommunikationstechnologie zuzuschreiben ist. Im Zusammenspiel dieser zwei Faktoren dürften in der New Economy eine höhere Wirtschaftsleistung und höhere Beschäftigung möglich werden, ohne dass gleichzeitig der Inflationsdruck steigt.

Eine derart grundlegende Veränderung im Wirtschaftsgefüge hätte natürlich in vielerlei Hinsicht weit reichende Auswirkungen auf die Geldpolitik – nämlich sowohl auf den geldpolitischen Kurs als auch auf die Wahl der geldpolitischen Strategie. Noch komplizierter wird die Einschätzung der künftigen Entwicklung durch zahlreiche Unsicherheitsfaktoren, die sich aus der zunehmenden Verbreitung der New Economy ergeben.

Zu dieser Thematik möchte ich sechs Punkte anmerken:

Meine *erste* Anmerkung bezieht sich auf die *Rolle der Geldpolitik in der Umbruchphase* am Beginn einer neuen Ära. Manche Proponenten der New Economy treten für eine Lockerung der geldpolitischen Zügel ein, um „dem Wachstum eine Chance zu geben“. Nun habe ich sicher Sympathie dafür, dass die Wirtschaftspolitik darauf ausgerich-

tet sein soll, Wirtschaftswachstum sowie Beschäftigung und gesamtwirtschaftliche Wohlfahrt zu fördern, aber ein derart kategorisch formulierter Anspruch an die Geldpolitik geht am Kern der Sache vorbei.

Unabhängig von einer New Economy besteht das oberste Ziel der Geldpolitik immer eindeutig darin, Preisstabilität zu wahren. Ein stabiler Anker für Preiserwartungen ist vor allem in Zeiten, in denen der künftige Verlauf der Entwicklungen noch ungewisser ist als sonst, wichtig. Es ist mittlerweile allgemein bekannt, dass die Geldpolitik mit einer konsequenten Stabilitätsorientierung dem Wirtschaftswachstum den größten Nutzen erweist. Ein Argument, das zur Untermauerung dieser These ins Treffen geführt wird – und das ich voll und ganz unterstütze – besagt, dass die niedrige Inflationsrate in den Neunzigerjahren entscheidend dazu beigetragen hat, ein Klima zu schaffen, in dem es zum jüngsten Gründerboom und Innovationsschub in den Vereinigten Staaten kommen konnte. Eine wesentliche Rolle beim Gründerboom und bei der Entwicklung neuer Technologien spielte natürlich auch die wettbewerbsintensive und weit weniger regulierte Marktstruktur der US-Wirtschaft.

Das heißt allerdings nicht, dass die Geldpolitik den Veränderungen, die die New Economy mit sich bringt, blind und uninformiert gegenüberstehen soll. Ganz im Gegenteil!

Womit ich zum zweiten Punkt meiner Ausführungen komme. In einer angesichts des Regimewechsels von Ungewissheit geprägten Situation lautet die zentrale Frage, die sich die geldpolitischen Entscheidungsträger stellen müssen: *Auf welche Wirtschaftsindikatoren sollen wir uns konzentrieren, um die voraussicht-*

liche Inflationsentwicklung am besten einschätzen zu können? Es ist nämlich so, dass eine Neugewichtung dieser Indikatoren angezeigt sein könnte. Die strategischen Ziele der Geldpolitik hingegen bleiben – wohl gemerkt – die gleichen.

Jeder Paradigmenwechsel kann die unerwünschte Nebenwirkung haben, dass sich Wirtschaftszusammenhänge, die sich über lange Jahre herausgebildet haben, verändern. Mit dem Auftauchen der New Economy ändern sich zahlreiche Variablen, aus deren Beobachtung die Notenbank normalerweise darauf schließen würde, ob das Potenzial für die Wirtschaftsentwicklung unzureichend oder vollständig ausgenutzt wird oder ob die Wirtschaft sogar stärker wächst und somit aufkeimender Inflationsdruck zu erwarten ist. Mit dem Vormarsch der New Economy würde das Wachstumspotenzial naturgemäß steigen. Dies wiederum hat zur Folge, dass die Zuverlässigkeit des Wachstumspotenzials als Indikator für die voraussichtliche Preisentwicklung abnimmt. Dies gilt natürlich auch für sämtliche direkt oder indirekt vom Wachstumspotenzial abgeleitete Variablen – etwa die Produktionslücke, die „inflationstabile Arbeitslosigkeit“ (NAIRU – Non-Accelerating-Inflation Rate of Unemployment) oder die natürliche Arbeitslosigkeit und das natürliche Wachstum.

Mit anderen Worten, die Notenbank müsste in Zeiten, in denen tief greifende Veränderungen im Trendwachstum des Wachstumspotenzials vermutet werden, derartigen Indikatoren weniger Gewicht beimessen. Gleichzeitig bedeutet dieser potenzielle Bruch in lange bestehenden Wirtschaftszusammenhängen, dass



quantitative Modelle – die für gewöhnlich auf langen Zeitreihen aufbauen – an Aussagekraft für die Interpretation der gegenwärtigen und künftigen Wirtschaftsentwicklung verlieren. Damit ist die Notenbank gezwungen, ein größeres Schwergewicht auf die *Analyse der laufenden Wirtschaftsentwicklung* zu setzen.

Damit komme ich zum *dritten* Punkt. Die *Zwei-Säulen-Strategie des Eurosystems* wurde nicht zuletzt im Hinblick darauf gewählt, für eine



Umbruchphase, in der Vieles ungewiss ist, gut gerüstet zu sein. Ich muss allerdings zugeben, dass wir in der Konzeptionsphase unserer geldpolitischen Strategie keine New Economy im Hinterkopf hatten, sondern

von ganz anderen Beweggründen geleitet wurden. Die Zwei-Säulen-Strategie erlaubt uns – ja zwingt uns – dazu, eine breite Palette von geld-, wirtschafts- und finanzpolitischen Indikatoren systematisch und eingehend zu beobachten, um daraus Rückschlüsse auf die künftige Inflationsentwicklung sowie die generelle wirtschaftliche Entwicklung zu ziehen.

Die Akzentverschiebung – also die Neugewichtung der Bedeutung, die wir den einzelnen Variablen beimessen, auf deren Notwendigkeit ich bereits hingewiesen habe – lässt sich damit problemlos bewerkstelligen.

Die Zwei-Säulen-Strategie unterstellt darüber hinaus nicht die Existenz klarer und stabiler wirtschaftlicher Zusammenhänge, wo diese nicht wirklich bestehen. So gesehen ist die Zwei-Säulen-Strategie eine sehr ehrliche Strategie. Damit sie für die Öffentlichkeit auch transparent ist, bedarf es allerdings be-

sonderer kommunikationspolitischer Anstrengungen seitens der Notenbanken.

Ich bin davon überzeugt, dass die Zwei-Säulen-Strategie allen auf rein mechanischen Regeln basierenden Ansätzen eindeutig überlegen ist – vor allem in der Umbruchphase, in der wir uns gerade befinden und in der Modellberechnungen hohe Unsicherheitsfaktoren aufweisen. Auf mechanischen Regeln basierende Ansätze sind für gewöhnlich auf eine bestimmte Sichtweise der Wirtschaftszusammenhänge zugeschnitten und somit in Umbruchphasen, in denen solche Sichtweisen möglicherweise adaptiert werden müssen, unter Umständen weniger zuverlässig. Handlungsanweisungen geldpolitischer Regeln werden normalerweise auf Basis einer sehr engen Auswahl von Wirtschaftsfaktoren erarbeitet. In vielen Fällen spielen dabei die Produktionslücke und der Gleichgewichtsrealzinsatz eine zentrale Rolle – also Indikatoren, die zum jetzigen Zeitpunkt besonders unzuverlässig sein könnten.

Den *vierten* Punkt meiner Ausführungen bildet folgende Frage: *Welche Langzeitfolgen wird die New Economy auf die Geldpolitik haben, bzw. mit welchen Auswirkungen auf die langfristigen Aussichten bezüglich der realen Zinssätze ist zu rechnen?* Auch diese Frage lässt sich nicht in einem Satz beantworten.

Sogar in den Vereinigten Staaten, wo jüngste Daten keinen Zweifel an einer signifikanten Steigerung des Produktivitätswachstums lassen, gilt es nach wie vor abzuwarten, ob die Internet-Ökonomie die Trendrate des *Produktivitätswachstums auf Dauer* erhöhen oder lediglich einen *einmaligen Sprung im Produktivitätsniveau* herbeiführen wird.

Selbst im letzteren Fall könnte es eine Zeit – ein Jahrzehnt oder län-

ger – dauern, bis in der Wirtschaft wieder ein Gleichgewichtszustand hergestellt wäre. Es ist kurz- und mittelfristig nicht absehbar, welchen der beiden Effekte die IT-Revolution auslösen wird.

Fünftens möchte ich mich nun dem Übergang zu einer möglichen New Economy zuwenden, einem Thema von aktueller Bedeutung.

Wie Alan Greenspan kürzlich anmerkte, birgt die *Internet-Ökonomie* für die Geldpolitik folgendes Risiko: Die Produktivitätssteigerung könnte bewirken, dass die gesamtwirtschaftliche Nachfrage stärker wächst als die potenzielle gesamtwirtschaftliche Produktion. Demzufolge muss die Geldpolitik das relative Ausmaß – sowie die zeitliche Komponente – der möglichen Auswirkungen auf Angebot und Nachfrage genau im Auge behalten. Auf diese Problematik möchte ich im Folgenden etwas näher eingehen.

Die Aussicht auf höhere Produktivität, verstärktes Wirtschaftswachstum und folglich gesteigerte Erträge kann die Aktienkurse von Unternehmen, insbesondere im IT-Sektor, in die Höhe treiben, wie dies ja bereits in den letzten Jahren zu beobachten war. Aktienkursgewinne ziehen einen finanziellen Vermögens-effekt nach sich. Gleichzeitig können sich auf Grund der derzeitigen Anspannung auf dem Arbeitsmarkt und der optimistischen Wirtschaftsprognose die Erwartungen der Arbeitnehmer bezüglich ihrer zukünftigen Löhne und Gehälter erhöhen; in der Folge würde sich auch das Humankapital vergrößern. Insgesamt könnte dies den privaten Konsum noch vor Eintreten der erwarteten Wachstumseffekte und über die tatsächlichen Effekte hinaus ankurbeln. Der Nachfrageüberschuss würde demnach die Inflation anheizen, und die Geldpolitik sollte handeln, um die Nachfrage auf ein

Ausmaß zu reduzieren, welches mit der Steigerung der Produktionskapazität der Wirtschaft im Einklang steht.

Sollten sich die von der Internet-Ökonomie ausgelösten Nachfrage- und Angebotseffekte mehr oder weniger im Gleichschritt entwickeln, wäre eine neutrale Haltung der Geldpolitik möglich. Damit ist nicht gemeint, dass die Zentralbank die nominellen Kurzfristzinsen konstant halten sollte. Vielmehr sollte sie danach trachten, die mone-



tären Bedingungen insgesamt einschließlich des Wechselkurses und der Langfristzinsen neutral zu halten.

Daraus folgt im Weiteren, dass die Geldpolitik nicht versuchen sollte, ein bestimmtes Aktienkursniveau zu erreichen oder die Kursentwicklung einzudämmen. Insbesondere während eines möglicherweise substanziellen Wechsels im geldpolitischen Regime ist es unmöglich, mit Gewissheit ein angemessenes Aktienkursniveau festzulegen. Die Geldpolitik sollte allerdings sehr wohl auf gegenwärtige und potenzielle gesamtwirtschaftliche Nachfrageeffekte Bedacht nehmen, die sich in Folge steigender und gegebenenfalls sinkender Aktienkurse ergeben könnten.

Abschließend möchte ich anmerken, dass sich die Faktoren, die der New Economy in den Vereinigten Staaten zugrunde liegen, ähnlich positiv auf Europa auswirken könnten.

Im Technologiebereich hat Europa – basierend auf den US-amerikanischen Erfahrungen – durchaus Chancen, gute Ergebnisse zu realisieren. Ein weiteres Argument stellen die Vorteile der europäischen Integration in die Weltwirtschaft und die Vorzüge des Gemeinsamen Marktes dar, wie z. B. die Deregulierung des Telekommunikationssektors und die Liberalisierung der Versorgungsunternehmen. Außerdem bedingt die Währungsunion einen Restrukturierungsprozess bei großen Unternehmen und ermöglicht den Einsatz neuer Wirtschaftspolitiken.

Insgesamt betrachtet muss auf europäischer Ebene noch energischer versucht werden, vorhandene Rigiditäten auf den Arbeits-, Güter- und Dienstleistungsmärkten zu beseitigen, ein unternehmerfreundlicheres Umfeld zu schaffen sowie Strukturen und Praktiken der Risikokapitalmärkte zu verbessern.

Ich bin daher überzeugt, dass *Europa ebenfalls Potenzial für eine New Economy hat*, vorausgesetzt, dass wir zu weiteren strukturellen Reformen bereit sind. Viele gute Gründe sprechen jedenfalls dafür, unserer Zukunft optimistisch entgegenzutreten. Einer davon ist die gut funktionierende Währungsunion, welche zahlreiche Chancen bietet. 

Literaturverzeichnis

- Brainard, W. (1966).** Uncertainty and the Effectiveness of Policy. In: American Economic Review, Vol. LVII, No. 2, Mai.
- Estrella, A., Mishkin, F. S. (1998).** Rethinking the Role of NAIRU in Monetary Policy: Implications of Model Formulation and Uncertainty. In: NBER Working Paper 6518, April.
- Federal Reserve Board (2000 a).** Humphrey Hawkins Testimony of the Chairman Alan Greenspan, 17. Februar.
- Federal Reserve Board (2000 b).** Technological innovation and the economy. Remarks by Chairman Alan Greenspan before the White House Conference on the New Economy, Washington D.C., 5. April.
- Ferguson, R. W. Jr. (2000).** Conversation with Leaders of the "New Economy". Rede an der Haas School of Business, University of California, Berkeley, 9. Mai.
- Gordon, R. J. (1999).** Has the "New Economy" Rendered the Productivity Slowdown Obsolete? Working paper, Northwestern University, 14. Juni.
- Issing, O. (2000).** European Integration at the beginning of the new millenium. Auszüge aus einer Rede vor dem Forum Dialogue, welches von der Banque Centrale du Luxembourg organisiert wurde. Luxemburg, 8. Februar.
- Jorgenson, D. W., Stiroh, K. J. (2000).** Raising the Speed Limit: U.S. Economic Growth in the Information Age. Working Paper, 3. März. Erscheint in: Brooking Papers on Economic Activity.
- Oliner, S. D., Sichel, D. E. (2000).** The Resurgence of Growth in the Late 1990s: Is Information Technology the Story? Mimeo, Federal Reserve Board, Februar.
- Orphanides, A. (2000).** The Quest for Prosperity without Inflation. In: ECB Working Paper No. 15, März.
- Schellekens, P. (1998).** Caution and Conservatism in Monetary Policymaking. In: Financial Markets Group Discussion Paper 284, London School of Economics, März.
- Srouf, G. (1999).** Inflation Targeting Under Uncertainty. Mimeo, Research Department, Bank of Canada, Jänner.
- Wieland, V. (1998).** Monetary Policy and Uncertainty about the Natural Unemployment Rate. In: Finance and Economics Discussion Series, Federal Reserve Board, Washington, D.C.

The inflation targeting approach

First a word of thanks for the invitation to attend this conference and discuss challenges for monetary policy together with such a distinguished panel.

In the last decade a growing number of countries have chosen to conduct monetary policy with an explicit target for inflation. One reason behind this choice has no doubt been these countries' poor experience with a fixed, but adjustable, exchange rate regime.

The first country to formally adopt a policy of targeting inflation was New Zealand, in 1990. Canada did the same in 1991, followed by the United Kingdom, Sweden and Australia. Since the early 1990s other countries have also introduced some variant of inflation targeting.

It is interesting to note that before the 1990s the predominant view was that a floating exchange rate regime was not suitable for a small open economy. Today, I believe that experience among those countries that are targeting inflation has been exceptionally good. In fact, even some emerging market countries are now building the same kind of regime.

It is not without some pride that I recall that, in a sense, Sweden was actually something of a pioneer in explicitly focusing monetary policy, with a flexible exchange rate, on a specified target for prices.

Back in 1931, after Sweden had been obliged to abandon the gold standard, its government and the central bank declared that the overriding objective of monetary policy would be the stabilisation of prices. More specifically, the finance minister of the day described the task of the central bank as that of, "using all

means available, preserving the domestic purchasing power of the Swedish krona". In this way, the Riksbank became the first central bank to declare price stabilisation as its policy norm with a floating exchange rate.

The norm was based on a proposal made much earlier, in 1898, by Knut Wicksell, often regarded as Sweden's greatest economist at the time. Wicksell's rule for monetary policy, which stemmed from his extension of the classical quantity theory of money, was simple: "*The central bank is to raise the discount rate as long as prices are rising, lower it as long as prices are falling and keep it constant when prices are stable*".

In other words, price stability was to be achieved through interest policy. Although the rule applied to the price level rather than to inflation and was not forward looking, it is a clear parallel to the rules of thumb that are used today by those central banks that target inflation.

Sweden's price stability norm in the 1930s lasted only a few years and was followed by a return to a fixed exchange rate regime. During those years, however, it performed the central function of stabilising expectations as well as prices. This was important not least because to some extent it helped shield Sweden from the global economy's depressive impulses and thereby contributed to the recovery being speedier than in most other countries.

Here I should perhaps add that although this Swedish price stability "experiment" attracted a good deal of attention at the time, it certainly



did not leave any deep or lasting mark on the modern approach to inflation targeting. In the aftermath of the depression and the second world war, Keynesianism gained ground. The introduction of inflation targeting in Sweden in the 1930s was therefore not as pioneering as when this kind of regime was introduced in the early 1990s, first by New Zealand and later by others.

A great advantage with a regime that explicitly targets inflation, is that the central bank adjusts the interest

one important explanation why Sweden is not a member of the ERM system – at least not at this stage.

The challenge during the 1990s for the inflation targeting countries has been to build a rigorous framework around the new regime. Answers have been needed in particular to questions like the following: What rate of inflation should be targeted, what index should be used, are bands around the target necessary, the degree of transparency etc?

It has also been important to formulate a monetary policy reaction function, that is, to define the balance between inflation variability and output variability. The reason why central banks do not aim for maximum

rate continuously in the light of inflation prospects. Compared with a fixed exchange rate regime, imbalances can then be prevented from building up to the same extent. A slight upward adjustment of the interest rate at an early stage, to reduce the risk of inflation picking up, is something quite different from having to hike the short-term interest rate in order to defend a fixed exchange rate.

As a personal reflection I can say that explaining the importance of low inflation is much easier – not least for a central bank governor – than the task of selling the advantages of a stable currency. This is particularly true as the latter task becomes increasingly pressing if the economy has been hit by problems with costs and is facing speculative attacks. Some of you may remember that for a few days in the autumn of 1992 the instrumental rate in Sweden was raised to as much as 500%. In my view, this is probably

short-term stability in either inflation or output is that attaining only one of the targets would be costly.

On the one hand, the central bank's legitimacy among the general public could be lost if short-term interest rates have to move sharply and cause output to fluctuate widely while inflation is being held stable and exactly on the target. Maximum stability in output could, on the other hand, result in sharp fluctuations in the rate of inflation and erode the target's credibility. Instead it is a matter of finding a point somewhere midway between the two extremes.

Looking ahead, I believe there are at least two major questions that central banks have to address more thoroughly.

First, how should monetary policy react to asset prices, such as equity and/or real estate prices? We know from history that the development of asset prices can have a significant impact on both inflation



and real economic activity. We need to establish whether or not there are actions that central banks can and should take to minimise the likelihood of macroeconomic instability arising from extreme fluctuations in asset prices.

Second, how should monetary policy react to structural changes in the economy? On this issue quite a lot of thinking has already been done, both among academics and policy-makers. Nevertheless, I believe that more must be done in this field, especially since at least some parts of the world economy have seen something of a productivity shock in recent years. I am carefully trying to avoid using the buzzword “new economy” here, since history has been full of expressions like that ever since the turn of the 19th century.

Unfortunately, I do not have the time to elaborate on the first question. Instead I will say a few words about the second.

Although the discussion about monetary policy and a productivity shock is taking place mostly in the United States, in the light of the impressive economic performance there and the acceleration in the rate of productivity growth, one could certainly ask: What about Europe?

Europe is, on the one hand, now in a strong upward economic phase. In addition, new technology, especially the Internet and telecommunications, is gaining ground in many European countries. On the other hand, Europe also differs from the US. The rapid growth of US investment has not yet been seen in Europe. One could also argue that the existence of quite a few structural obstacles in Europe makes an acceleration of productivity growth less likely in the immediate future.

A handful of countries – including the Netherlands, Ireland, the UK and, more recently, Sweden

and Finland – have achieved strong economic growth and in some cases also low inflation. But with the exception of Ireland, these countries have not yet enjoyed the same strong productivity growth as the US.

Nevertheless, the possibility of a productivity breakthrough also in Europe cannot be ruled out. It will probably depend on how well Europe succeeds in reforming micro-economic policy.

Higher – or accelerating – productivity growth does indeed pose



new challenges for monetary policy. It could set in motion a complex of effects on aggregate supply and demand, on inflation, equity prices and interest rates. Just to give a few examples, let me briefly mention the following effects:

First, a positive productivity shock raises the economy’s potential growth rate. It also affects aggregate demand through new, profitable investment opportunities, higher equity prices and expectations among households of higher permanent income. One question for policymakers is whether the demand effects are so powerful that they have the potential to outpace the growth of aggregate supply in the short and medium perspective.

Second, there could be temporary disinflation effects at work if the increase in productivity is unexpected initially. If wages are slow to adjust, higher productivity growth lowers unit labour costs and thereby reduces price inflation. Here again

there are important questions for policy makers. Should this effect be allowed to result in a temporary reduction of price inflation or unemployment?

Third, an increase in the trend rate of productivity growth could also result in a higher equilibrium real interest rate, when the output gap is closed, in order to balance saving and investment. Fiscal policy and the development of public financial balances could at least partly offset this effect, as could the economy's degree of openness.



All this implies that monetary policy-makers, also in Europe, could face quite a few challenges. One of them is to identify structural changes and distinguish these from cyclical variations.

Another challenge is to detect the magnitude of the effects. Furthermore, looking ahead in monetary policy is hard when the economy is going through major changes that make it difficult to forecast the future path of the economy and inflation.

It is quite clear that this demands a great deal of forecasters as well as of those who construct macro models. The forecasts concern inflation

one to two years ahead, which calls, for instance, for reasonable precision in the measurement of the output gap and the relationship between the output gap and inflation.

It is already evident, for example, that in the 1990s inflation forecasts in many countries were frequently on the high side. I believe that the best we can do, at least at this stage, is to pay close attention to incoming data in the forecasting process, and not mechanically use the results from models that rely too heavily on historical relationships. We have to deal more successfully with the fact that forecasts of economic developments can never be completely accurate and still allow monetary policy to be forward looking.

When discussing monetary policy of today, we must remember that we have come a long way. The world economy shows strong growth coupled with low inflation and monetary policy has contributed to this development. However, there are interesting, though somewhat difficult, challenges ahead of us which must be met if we are to preserve this bright picture of the world economy. This conference will contribute to a better understanding of the issues and problems involved. ☪

Current challenges for U.S. monetary policy

It is a pleasure and an honor to be invited to participate in this conference. I last visited Vienna in 1962, when I was a Fulbright scholar at the University of Strasbourg in France. Needless to say, Vienna has maintained its appearance much more successfully in the intervening years than I have, but I am very happy to have this opportunity to return nonetheless.

Let me offer a few of my views regarding the challenges facing U.S. monetary policymakers currently. Notice that I said challenges we're confronting "currently" rather than "in the new economy" or "in the new economic paradigm." In this regard, some of you may have seen the comments about paradigms by my friend and colleague Bob McTeer, president of the Dallas Fed, in his Bank's current Annual Report. Bob points out that if you want to cook a frog, which I gather some people do, you don't just throw it into a pot of boiling water because it will jump out. Instead, you put it into a pot of cold water and slowly increase the heat, since it won't realize its paradigm is shifting.

I don't know whether Bob had me specifically in mind when he told that story, but I suspect he had in mind people who think about this issue the way I do. I confess to being very skeptical about the view that the macroeconomy functions – if that's the right word – in a systematically different way now from the past, requiring a markedly different approach to conducting policy.

I do, however, recognize that some of the U.S. economy's key parameters, like the sustainable

longer-term GDP growth rate, may have changed, and that the Fed and other central banks facing similar changes need to take this into account in their efforts to optimize the contribution of policy to economic performance. Where I might differ from some new paradigm advocates is that I believe we can do this effectively using analytical models that have evolved from the rational expectations revolution of the 1970s. Specifically, my own approach to policy analysis currently draws heavily on new neoclassical synthesis models, which integrate real world phenomena like price stickiness that many would think of as Keynesian with modern real business cycle theory. My colleague Marvin Goodfriend and several other members of our Bank's staff have made important contributions to the development of these models and to our appreciation of how they can be used to help guide monetary policymakers in making policy decisions in a changing environment.

This is not the place for a detailed discussion of these models, and I am certainly not the one to deliver it in any case. But let me briefly describe one of their key features, which will be useful when I turn in a minute to the U.S. economy and the immediate monetary policy challenges we face. In these models, the real interest rate (presented in the models as a single, representative rate) plays a central stabilizing role. Basically, the real rate



serves as an intertemporal rate of substitution. In simple language, the real rate establishes how much households and business firms have to give up in terms of future consumption if they choose to consume and invest today. An unsurprising corollary is that the level of the rate directly affects the strength of the aggregate *current* demand for goods and services – the lower the rate, the stronger demand, and vice-versa. In what follows I hope to show how this quite straightforward framework can be useful in analyzing current policy options in the U.S. and elsewhere.

Before doing this, let me briefly review a few of the main features of recent U.S. economic developments. As you may know, the U.S. economy recently entered its tenth consecutive year of economic expansion; indeed, we are enjoying the longest continuous expansion in our history. GDP growth during the early years of the expansion was somewhat below average compared to the corresponding phases of earlier post-World War II expansions. Growth equaled or exceeded 4% in each of the last four calendar years, however, and was about 5½% at an annual rate in the first quarter of this year. These are exceptionally high growth rates at such an advanced stage of an expansion. Moreover, domestic demand grew at a 5.1% annual rate over this same time period. Most economists believe growth at this rate exceeds the sustainable growth in aggregate domestic supply, a supposition supported by the steady recent increase in the U.S. current account deficit. Beyond this, labor markets are exceptionally tight, and the national unemployment rate – at 4.1% – is close to its lowest level in a generation.

Despite these signs of domestic macroeconomic imbalance, U.S. inflation has remained reasonably

well contained up to now. The core consumer price index rose 1.9% in 1999, and the core personal consumption expenditures price index rose 2.1%. Most recently, however, core inflation has shown signs of accelerating. The core CPI, for example, rose 2.2% in the 12 months ended in April compared to only 1.9% in the 12 months ended last December.

There are some signs in the most recent monthly economic data that the growth of demand may be moderating. These signs are hopeful but at this point must still be considered tentative.

In this situation, as you know, the Federal Open Market Committee has increased its federal funds rate operating instrument on six occasions recently, from 4¾% last summer to 6½% currently. In a world where central bank transparency is increasingly valued, it is essential that the American public understand clearly the rationale for Fed actions, particularly tightening actions such as these. In this instance, while the increases have been reasonably well received by many Americans, they have not been accepted by all, at least in part because the increases seem counterintuitive to some in the context of the new economy-new paradigm idea. Specifically, many “new economy” adherents apparently believe that rising labor productivity growth has restrained increases in labor costs and hence reduced the risk of a renewal of inflation and reduced the need for preemptive monetary restraint by the Fed.

It is true that accelerated productivity growth temporarily limits labor cost increases in the interval before increased demand for workers forces wages up, and the initial increase in the output of goods and services can temporarily restrain

price increases. I don't believe, however, that new economy advocates have thought this matter through fully. The analytical framework I mentioned earlier suggests exactly the opposite policy conclusion. It indicates that higher interest rates are required to restore macroeconomic balance and ensure *sustained* higher growth over the longer term.

Some background information on recent U.S. productivity growth trends is required to appreciate this result. U.S. hourly labor productivity grew at about a 2¼% average annual rate over the 80-year period between 1890 and 1970. This persistent and healthy growth had an enormously positive impact on income and living standards. At this rate, output per worker doubled approximately every 30 years and increased nearly eight-fold over the period as a whole.

Around the mid-1970s, however, trend productivity growth decelerated noticeably to about a 1½% annual rate, at which rate per worker output doubled only about every 45 years, and the reduced growth persisted until the mid-1990s. We still don't fully understand the cause of the slowdown, although it is reasonable to suspect that it was related in part to the oil shocks of the mid- and late-1970s and the high inflation of that period. It may also have reflected changes in the composition of the workforce, particularly the entry of a large number of young workers with less than average work experience and therefore lower productivity.

Whatever its causes, the key point is that most Americans perceived the slowdown, although they did not think of it analytically in terms of a reduced trend productivity growth rate. Rather, they thought of it in personal terms as reduced economic opportunities both cur-

rently and prospectively. It was during this period that, for the first time in recent U.S. history, many workers concluded that their living standards would be no higher than their parents'.

As you undoubtedly know, there is now considerable evidence that trend productivity growth in the U.S. has revived since the mid-1990s. It is of course much too early to verify this statistically, but the persistently higher-than-expected real growth in the U.S. economy over the last four years or so without a reacceleration of inflation would be consistent with higher trend productivity growth, and many U.S. economists now estimate that this trend growth has increased 1 to 1½ percentage points from the reduced mid-seventies to mid-nineties rate to the vicinity of 2½ to 3% currently. With trend labor force growth at approximately 1%, trend productivity growth at this higher rate would imply that the economy's "speed limit" – its maximum sustainable, noninflationary growth rate – is now in the neighborhood of 3½ to 4%, an appreciable increase from the commonly perceived 2 to 2½% limit in the early nineties.

Just as the earlier slowdown in trend productivity growth was perceived, at least intuitively, by the public, so, too, the apparent recent acceleration in trend growth is perceived. Evidence of this perception is widespread. The long bull market in U.S. stocks reflects higher expected future business earnings growth. And I can assure you that my two grown sons and their friends and associates expect lifetime incomes and living standards well above their parents'. Again, neither



my sons, other households, or business firms typically think explicitly of their expected higher future income as the result of an increase in trend productivity growth. But their expectations and – as I will indicate momentarily – the actions they take based on these expectations make it clear that they perceive the increase implicitly.

What do all these developments in the “real” economy have to do with monetary policy? The answer is that U.S. households are now borrowing

and elsewhere around the world, which may soon put upward pressure on the dollar prices of imports. And labor shortages are now widely reported in a number of sectors and industries. On their present course, U.S. labor markets will eventually tighten to the point where competition for workers will cause wages to rise more rapidly than productivity, which sooner or later would induce businesses to pass the higher costs on in higher prices. As I suggested earlier, there is evidence in some of the latest U.S. price and labor cost data that an inflationary process of this sort may now be beginning.

The implication of this analysis, as I indicated at the outset, is that the apparently



quite liberally against their higher expected future incomes to consume today. They are buying new homes, adding on to existing homes, and buying consumer durables such as new cars, furniture and electronic equipment. Similarly, firms are borrowing against their higher expected future earnings to invest in new plant and equipment.

The problem posed for monetary policy by all this is that the higher expected *future* income driving the increased current demand for goods and services is not yet available in the form of increased *current* output of goods and services. This mismatch between expected future resources and currently available resources, in my view, is the principal factor creating the present aggregate demand-supply imbalance in the U.S. economy I discussed earlier. The excess demand has been satisfied to date by imports and progressively tighter labor markets. But demand is now rising more rapidly here in Europe

higher trend productivity growth in the U.S. economy – whether one labels it a “new paradigm” or not – requires higher real interest rates to maintain macroeconomic balance. In order to prevent a reemergence of inflationary pressures and, in doing so, to sustain the expansion, U.S. monetary policy must allow short-term real interest rates to rise to induce households and business firms to be patient and defer spending until the higher expected future income is actually available, in the aggregate, in the form of higher domestic output.

This necessity presents the Fed with several challenges. First, while the need for rate increases seems clear, how do we decide on the magnitude and timing of the increases? In principle, of course, we want to allow rates to rise to the level where the growth in aggregate current demand equals the sustainable growth in productive capacity. In the technical language I noted ear-

lier, ideally we would like to establish an equilibrium intertemporal rate of substitution consistent with aggregate demand-supply balance. Identifying this equilibrium level is difficult, because it is continuously responding not only to the apparent trend productivity growth increase but to any number of other shocks hitting the economy. Taylor-type rules may offer some operational help in setting the appropriate federal funds rate level, but in the absence of a stronger professional consensus regarding how to use these rules, policymakers in practice will have to apply judgment based on their interpretation of current economic data and forecasts.

As you know, we have in fact been allowing real rates to rise. (I am deliberately avoiding the mislead-

ing terminology that the Fed is “raising rates.”) In the spirit of the increased emphasis on transparency in monetary policy, perhaps the principal challenge for the Fed currently is making it clear to the public that these actions have not been the misguided result of “old economy” thinking, but steps that are essential for maintaining balance and maximizing long-term growth in the economy, whether one regards it as new, old, or simply evolving.

References

- Goodfriend, M., King, R.** The New Neoclassical Synthesis and the Role of Monetary Policy. In: Bernanke, B. S., Rotemberg, J. J. (eds.), NBER Macroeconomic Annual 1997. Cambridge, MA: MIT Press, 231–282. 

Financial stability policies as challenges for modern central banking¹⁾

Introduction

The problem I would like to discuss here is how much, and how, modern central banking should be involved with policies for financial stability. It is convenient to start by defining modern central banking, in a historical perspective, and by stressing its main functions.



A reasonable definition of *modern* central banking would place its beginning during the 1980s. It had been preceded by a very long period of *traditional* central banking, which started after the end of *classical* central banking, that can be associated with the “gold standard” and with Hume’s “rules of the game”. Obviously, central banking had been in existence, in a more *archaic* and unsettled form, for a long time before becoming classical, since when “it all began” and the central bank of Sweden was founded, 332 years ago. In fact “the Riksbank can claim to be the oldest central bank in the world, beating the Bank of England by a generation” (Deane and Pringle, 1994, p. 33).

The main function of “archaic”, pre-classical central banks, when they were set up, in Europe, in the 18th and 19th centuries, was to “*provide finance* on beneficial, subsidised terms *to the Government* of the day, in return with certain monopoly rights in note issuing” (Goodhart, 1988, p. 19 to 20). Their creation “resulted from the coupling of the

Government’s urgent need for money with the bank promoters’ desire for the profits of both speculation and monopoly” (Cameron, 1967, p. 20).

Later, during the classical times, the major objective of central banking has been to *keep financial stability*, including currency convertibility into specie, with a new attention to their supervisory role. The control over money supply was dominated by the convertibility target: “The monetary (macro) functions of central banks were largely grafted onto the supervisory functions, and not the reverse” (Goodhart, 1988, p. 7).

Then, when central banking entered its traditional stage, it became heavily involved in *discretionary monetary management*. Discretion, to be sure, was often used to make it easier and cheaper for governments to finance their deficits, also using direct controls on credit allocation, which acted on the banking industry as instruments of both implicit taxation and protection from competition (Bruni, 1990, Bruni, Penati and Porta, 1988): From this point of view an “exchange of favours” took place between governments and banking resembling “archaic” times.

Finally, the primary objective of modern central banking is maintaining *price stability*. It is the general style of monetary policy that makes the main difference between traditional and modern central banking: The latter is more precisely anti-inflation oriented with a lower

¹ The authors’s contribution draws in part from his paper on “Challenges for Modern Central Banking” to be published by the Sveriges Riksbank.

degree of goal-independence, while its instrument independence is higher; it does not rely on direct controls; it tends to overcome its credibility problem in a rational expectations context by following predictable and transparent rules. Its much lower ambition in influencing the macroeconomic cycle and in fine-tuning aggregate demand in the short term *echoes certain aspects of classical central banking.*

In fact crucial aspects of the economics of classical times, like price-wage flexibility, productivity shocks and international capital mobility, are gradually coming back in modern times (are these really shaping a new economy?). *Financial fragility* is also a factor that might suggest that problems of classical times are back with us, after the interval during which traditional central banking has been reigning. As said above, keeping financial stability was probably the “raison d’être” of classical central banking. Having in mind this historical perspective, it is worth discussing the relationship between modern central banking and the set of policies that are devoted to enhance and preserve financial stability: *regulation, supervision and crisis management.*

Special attention should be devoted to the case of the EU and of the euro area, where the problem is made very acute by the fact that no direct responsibility is attributed for achieving financial stability to central European institutions. “It is inconsistent to try promoting financial stability in an integrated market for financial services with free movement of capital and of establishment while maintaining the responsibility for banking regulation and supervision at the national level. It is an inconsistency similar to the one arising from the conduct of national monetary policies in a fixed exchange rate sys-

tem with free capital movements. This inconsistency was the reason for moving to monetary union” (Bini Smaghi, 1999, p. 10). And EMU is expected “to increase considerably competition in banking within the euro area, with a significant impact on the risks incurred by banks” (De Bandt and Davis, 1999, p. 6). The problem of optimal financial stability policies and institutions in the euro area is therefore peculiarly difficult, urgent and important.

To discuss the relationship between modern central banking and stability policies it is convenient here to limit the analysis to three specific topics:

1. “lending of last resort” (LOLR) and connected problems,
2. the issue of asset price stabilisation, and
3. some characteristics of the optimal institutional setting where to locate both central banks and the agencies responsible for financial stability.

Lending of last resort and prompt corrective action

As said above, financial stability policies can be considered to include regulation, supervision and crisis management. The involvement of central banking with these policies crucially depends on the role and functioning of *lending of last resort* (LOLR), which is the form of crisis management financed with central bank’s money (Padoa-Schioppa, 1999). Three problems arise with the relationship between LOLR and central banking:

- a) How much regulation and supervision LOLR requires to take place inside the central bank?
- b) Once we take for granted that macro-LOLR is a typical function of central banks, how far should micro-LOLR be included among their responsibilities?

- c) How much can LOLR be limited to *solvent but illiquid* financial institutions?

If markets were sufficiently transparent and efficient to make it easy to distinguish a solvent but illiquid institution from an insolvent and illiquid one, all three problems would have a relatively simple solution. Central banks could limit themselves to macro-LOLR, with markets taking care of financing solvent but illiquid institutions. Cases of insolvency could be dealt with crisis



management techniques (including government intervention) that do not involve substantial central bank action, and LOLR would not require a relevant amount of regulation and supervision inside the central bank. Modern times could rely on the classical model of central banking. LOLR would be “not banking policy at all” (Goodfriend and King, 1988, p. 17). With a credible deposit insurance system in place, Diamond-Dybvig-type¹) liquidity shocks could be avoided and this would reinforce the case for aiming at financial stability with practically no micro-LOLR.

Things get much more complicated if markets lack the information and the efficiency to quickly *tell a solvent from an insolvent illiquid institution*. If this is the case, timely financing to solvent but illiquid institutions may be lacking, in spite of central banks’ monitoring of the adequacy

of the aggregate supply of liquidity and of their consequent macro-LOLR activity. One could find some connection between this complication and the practical difficulty of telling a Diamond-Dybvig-type liquidity shock from an information-induced liquidity shock of the Jacklin-Bhattacharya-type²), where the latter could also be the beginning of a structural crisis of a whole section of the banking industry. If the distinction between insolvency and illiquidity requires the information advantage of a supervisory authority together with some risky discretionary judgement, it becomes natural to identify this authority with the LOLR provider, i.e. the central bank. In this case it is difficult to set a well justified limit to the width of the responsibility of central banking with regulation and supervision. In modern central banking micro-LOLR would become a relatively frequent action to be, at least, taken into consideration. Even if the policy of denying credit to insolvent institutions were to be strictly maintained, and ex-post LOLR were to be granted only to very rare cases of truly solvent but temporarily illiquid intermediaries, the cases to be examined would be numerous and the timing of the scrutiny could even require to transform the nature of micro-LOLR into something like “*lending of ... first resort*”, putting at risk some central bank money while waiting the results of the “due diligence”. Political pressures and financial industry’s lobbying activities would then probably interfere with the decision process.

To the extent that these consequences are considered undesirable, efforts must be made to organise the system of modern central bank-

¹ Diamond and Dybvig (1983).

² Jacklin and Bhattacharya (1988).

ing to deal with the insolvency-illiquidity problem in a different manner. An attractive solution has been proposed in the literature and, at least in principle, introduced in the legislation of the USA (Benston and Kaufman, 1998) and of Japan (Milhaupt, 1999). It is the “early intervention system” labelled *Prompt Corrective Action* (PCA). By compelling regulators and supervisors to intervene progressively, with a predetermined list of measures, as a series of objective indicators shows the deterioration of the profitability and soundness of financial institutions and places them in lower rated categories, PCA can avoid forbearance, prevents insolvencies and allows credible commitments to close institutions before their net worth becomes negative. PCA buys time to understand and correct the causes of problems of illiquidity before they can be confused with signals of insolvency, during a period when micro-LOLR can be granted together with the imposition of monitoring and constraints on the intermediaries’ behaviour. If the PCA authority is separated from the central bank, adequate information and co-ordination between the two agencies can be organised to optimise the process without the pressure of urgency that characterises the crisis management of an institution that has liquidity problems *and* may be already in a state of insolvency.

Dealing with questions a), b) and c), listed at the beginning of this section, becomes easier with PCA. Regulation and supervision go along with market discipline and the role of LOLR in central banking can be defined in a transparent and credible form, with rules leaving due space to discretion and “constructive ambiguity”. In this sense it seems that PCA should be considered a very important feature of the framework of

stability policies that must be enacted to meet the “challenges of modern central banking”. Its adoption in the euro area has been advocated by the first statement of the recently established European Shadow Financial Regulatory Committee (ESFRC, June 1998).

Finding an appropriate setting and use of LOLR and PCA policies would make it less dramatic the fact that no consensus seems to exist on what is a satisfactory solution for the connected problem of *deposit insurance*. “There is disagreement as to whether deposit insurance is a useful mean of stabilising the banking system by preventing bank runs” (Dale, 2000, p. 52) and there is no lack of evidence that, because of moral hazard effects, “explicit deposit insurance tends to be detrimental to bank stability” (Demirguc-Kunt and Detragiache, 1999, p. 20). The problem of the credibility of an explicit deposit insurance system is complicated by the famous *too-big-to-fail* issue. It is fair to say that modern central banking cannot rely on a robust, modern and widely-shared view of how an optimal and feasible deposit insurance system should be organised. This also means that there is no clear view of which is the right relationship and division of responsibilities between the deposit insurance agency, the supervisory authority and the central bank. It is therefore tempting to conclude that deposit insurance is *not* a modern type of arrangement and that we should exploit the fact that there is a large substitutability between its potential functions and the role that well managed LOLR and PCA policies can play.



Asset price stabilisation

Besides indicating the potential financial distress of institutions, the term “financial instability” is also widely used to refer to a closely linked phenomenon, namely the *instability of asset prices*. Bubbles and crashes have a social cost that goes beyond the trouble they can cause to financial intermediation. It may be useful to consider this subject, separately, as an issue for monetary policy and as a problem for pure stability policy.

As far as *monetary policy* is concerned, the famous Greenspan’s dilemma with “irrational exuberance” can be interpreted as the question whether, and if so how, monetary policy should respond to asset prices. In the perspective of inflation control, the issue has been discussed whether or not asset prices should be included in the targeted price indexes (e.g. Goodhart, 1995, with published comments); whether or not, when asset prices appear out of line with economic fundamentals, central banks should lean against the wind.

The answer that seems more coherent with the spirit of modern central banking is that the behaviour of asset prices should influence monetary policy only indirectly, to the extent that it can be considered an indicator of future expected behaviour of the general (non asset) price level. The orthodox view is that monetary policy aimed at delivering goods’ price stability is the best protection against financial instability, including the instability of asset prices. A more direct concern of monetary control with asset prices cannot rely on objective criteria to tell price misalignments from reflections of fundamentals, and may also run into dangerous timing problems in trying to fight against bubbles.

Still, the temptation to challenge this conventional wisdom of modern central banking is not groundless and the issue probably deserves further research. Fluctuations of asset prices are also important for their potential impact on the liquidity of market portfolios and therefore for the assessment of the aggregate demand for money. Moreover, “at least at low inflation rates, financial instability is likely to raise the risk of price deflation” (Crockett, 2000, p. 8). More generally, not only is price stability conducive to financial stability, but also the other way around. By paying more attention to asset prices, although inflation might deviate from its target in the short run, it can be made less variable in the longer term (Cecchetti et al., 2000). During a share price bubble raising interest rates may initially push inflation below target, but, if some air is freed from the bubble sooner, the impact on inflation when it bursts is more modest.

The main problem is how to implement in a transparent, symmetric and objective way a monetary policy strategy that takes asset prices into consideration. An attractive hypothesis (see Crockett, *ibidem*) is that monetary policy could limit the build up of dangerous financial imbalances by adopting a strategy where a substantial role is given to monetary and credit aggregates, as primary indicators or intermediate objectives, on the lines of the now largely abandoned “monetarist” reaction functions. In fact, an abnormal behaviour of monetary and credit aggregates facilitates asset price misalignments, even when goods’ prices remain stable and when there is no clear evidence for expecting higher inflation. As Otmar Issing puts it: “Giving a role to money in setting policy, alongside its inflation target, may serve a similar role as taking

asset prices into account: asset price bubbles cannot develop without a splurge in money and credit" (The Economist, 2000, p. 78). The ECB's monetary policy strategy, where M3 is formally considered a "first pillar" (but *only* formally!), would allow such an approach (even if the aggregate plays the role of a special indicator and not of an intermediate objective), where aggregates are considered anchors for financial as well as for monetary stability.

As far as pure *stability policies* (i.e. stability policies that are not implemented through monetary policy) are concerned, the optimal situation is one where asset prices are stable as a *spontaneous consequence* of good supervision and regulation, moderating and preventing excessive and destabilising speculation. But in the case where bubbles and crashes threaten, also via contagion, the overall stability of financial markets, it may be difficult for the authorities to refrain from interventions: Central banks can take care of them, provided they are not aimed at specific assets or individual institutions' portfolios, and provided they will be "sterilised" in due time.

In the euro area, where financial instability has traditionally been a pattern of bank failures following loan and trading losses, with monetary unification favouring *disintermediation and securitisation*, new challenges may well arise. Crises might occur "of a type more characteristic of the US, linked to pure volatility in asset markets following shifts in expectations (which may threaten leveraged institutions that hold positions in these assets) or the collapse of market liquidity and issuance, which threatens institutions needing to transact or issue in such markets" (Davis, 2000, p. 25). In a world where boundaries between banks, nonbank financial inter-

mediaries and securities and asset markets in general are vanishing, intervention on asset markets belongs to the same logical category of macro-LOLR.

Exchange rates can be considered among the most important asset prices. Therefore also the issue of *exchange rate intervention* is one of asset price stabilisation by central banks. Besides taking into account the exchange rate's direct impact on inflation, modern central banking could try and stabilise, to some



extent, the external value of the currency to prevent serious misalignments that will make monetary control more difficult in the longer run. But in order to do this, an institutional problem has to be solved in the assignment of the responsibility and of the powers on the external value of the currency between the central bank and the Government. This is not an easy assignment to clarify in a transparent and efficient way, without compromising the credibility and independence of the central bank, on the one side, and the natural "foreign policy" power of the Government in determining the exchange rate, on the other side. In this matter the Treaty of Maastricht has given special powers to the ECB. But the experience of the first period of euro policies seems to suggest that the exchange rate issue is one of the weakest aspects of EU's monetary arrangements. Perhaps the consideration that exchange rate stabili-

sation can be viewed not only in the traditional flow-of-goods-price-competitiveness perspective, but also from an asset-price-financial-stability point of view, can help finding an innovative and better agreement on how the central bank and the Government should co-operate in setting the exchange rate policy strategy and tactics.

Financial stability policies, institutional separation and central bank independence

To draw the optimal institutional features of financial stability policies, as well as to understand their relationship with “modern” central banking and monetary policy, three problems have to be solved. First, it has to be decided whether or not *institutional separation* must exist between monetary and prudential policies. Second, the right *degree of centralisation-internationalisation* of prudential policies has to be chosen. This issue has a special European aspect given the recent adoption of the euro and the creation of the ECB; but it is also relevant at a world level because prudential policies are increasingly a matter of potential global co-operation in redesigning the structure and regulation of the international financial system. Third, the optimal institutional solution must indicate whether financial stability should be the aim of a *universal agent*, responsible for the whole financial sector (banks, securities and insurance) and for the whole set of stability policies (regulation, supervision, crisis management, transparency), or of different specialised agencies.

The literature on the issue of institutional separation (the basic reference being Goodhart and Shoenmaker, 1992) has discussed, mostly at a theoretical level, its pros and cons. The main set of advantages

of having prudential supervision within the central bank has to do with the economies of information that the combined responsibility will obtain, allowing, among other things, an easier protection of payments systems and a better informed management of systemic liquidity problems in times of financial crises. On the contrary, the main arguments in favour of institutional separation are based on the potential conflicts of interest that characterise monetary and stability policy, especially when the economic cycle would ask to the former to counter the cycle, while the effect of regulation tends to produce less restrictive conditions if the cycle is positive, and vice versa.

This is not the right place to develop this issue and decide in favour or against separation. It is probably better to touch upon an aspect of the discussion which is often overlooked, while it seems very important to illustrate how this problem can be a challenge for modern central banking. This aspect is the relationship of the institutional separation issue with the *independence* of central banks.

Independence is a well-known, crucial characteristic in the emerging profile of modern central banking. The statute of the ECB is probably the most precise in stating the specific conditions that can define (see, for instance, Bruni, 1999) and measure (see, e.g., Grilli, Masciandaro and Tabellini, 1991; Bruni, 1997) independence. But, in spite of the richness of the relevant literature and of the connected policy debate, little attention has been devoted to study how financial stability policies can interfere with central bank independence. What is at issue is not only the above mentioned, potential conflict of interest between the authorities responsible, respectively, for financial and for price stability. The

problem is deeper and has to do with *the type of discretion* that is inevitably attached to regulatory and supervisory activities: It looks very difficult to protect this discretion from the interference of political and special interests, much more difficult than protecting the discretion to be used for manoeuvring the instruments of monetary control. Moreover, the interference coming from central banks' regulatory and supervisory activities could spill over and disturb their monetary policy decision process. Bini Smaghi (1999, p. 28 to 31) and Di Noia and Di Giorgio (1999, p. 10 to 12) have some recent econometric evidence suggesting that higher and more variable inflation could then result.

One can try to simplify the issue by stressing the *distinction between regulation and supervision*, with only the latter included in central banking. This could be justified on two grounds:

1. It is the power to regulate that seems more dangerous for independence.
2. Supervisory information can be useful to improve monetary policy (surprising econometric evidence of this fact for the USA is offered by Peek, Rosengren and Tootell, 1999).

But it is difficult to think in concrete terms to supervision without a certain content of regulation. Moreover, useful supervisory information can be made available to the central bank by the independent supervisory agency (even if Peek, Rosengren and Tootell tend to show that the kind of information that is useful for monetary policy can only be obtained with "hands-on" supervisory experience).

In any case, even leaving aside the relationship with monetary policy, the problem of the *independence of the regulatory agency* (be it or not

the central bank) and of financial stability policies, has still to be studied and solved in a way as consistent as in the case of monetary policy. A market-friendly design of stability policies that tend to exploit, and not to suffocate, market discipline, is among the necessary elements to make progress in this direction; as it is a precise definition of the final objective of stability policies, to make the authorities clearly accountable for their results (PCA is an interesting approach also in this respect).

When policies for financial stability are discussed the role of *market discipline* is at issue. Ideological and extremist approaches to the problem must be avoided: In fact the working of the real world of capital markets is fairly complex and no simple rule will serve as a solution. Market discipline means that "markets provide signals that lead borrowers to behave in a manner consistent with their solvency" (Lane, 1993, p. 55; Bruni and Paternò, 1995).

Market-friendly regulation can often be obtained with the help of *competition in regulation*: competition among different regulators in the same country, and/or competition among different national regulators. A market-determined optimal regulation (and supervision) is an undoubtedly attractive aim even if it may look as a contradiction in terms. In theory, this competitive regulatory equilibrium could assign the *right regulatory role also to central banks*. But there are several difficulties in thinking along these lines. One of them deserves special attention, also in view of its relevance for the current debate on reforming international financial regulation and



designing the optimal regulatory and supervisory framework in the euro area.

The problem is that regulation often acts also as a *protection* for the regulated operator. This means that shopping (by financial operators) for the optimal regulation may not be a virtuous mechanism of arbitrage and, as a consequence, competition in regulation can turn out to be a failure, yielding (or simply preserving) a strongly distorted, inefficient regulatory framework. If this is the case, optimal financial regulation requires centralised decision making or, at least, a pervasive process of compulsory harmonisation: In international terms it requires supranational institutions and rules (as soft co-operation can turn out to be counter-productive).

The issue is very important for the euro area (see, e.g., Bruni and de Boissieu, 1999; Lannoo, 2000; Vives, 2000) but also for the evolving architecture of the international monetary and financial system. The strong political content of this centralisation process seems one of the reasons not to rely on modern central banking to carry it out. But the strong political difficulty of winning the reluctance of national bureaucracies to give up national regulatory controls and crisis management procedures, should not discourage the efforts to reach, as soon as possible, a sufficiently centralised and forcefully harmonised system. A recent CEPR analysis (Favero et al., 2000, p. 40 to 65) has shown some lack of courage, in this respect, advocating an attitude which would give up centralisation, considered “economically sound but politically hopeless”, in favour of a decentralised setting where financial stability would result from New-Zealand-type extreme disclosure policies maximising the role of market discipline. While

reaching such a hands-off market-based self-regulatory setting does not seem more politically feasible than aiming at a gradual and reasonable degree of centralisation, in the former approach the role of market discipline has an ideological flavour that has been labelled “extremist” at the beginning of this section.

The more or less centralised agency which is responsible for financial stability can be more or less universal. The rapid decrease of the boundaries between the various kinds of financial institutions and markets is probably among the main reasons to avoid entrusting substantial regulatory and supervisory responsibilities to modern central banks. Good arguments seem to exist in favour of a single authority (also at the EU’s level), separated from the central bank, with the responsibility of *co-ordinating* stability policies (regulation, supervision, PCA, and, when unavoidable, crisis management), towards all types of financial operators and markets. Powerful and authoritative co-ordination by this agency could leave room for substantial decentralisation, including specifically delegated “hands-on” supervisory actions by the national central banks. ☛

References

- Bini Smaghi, L. (1999).** Who takes care of Financial Stability in Europe? Lecture at the Financial Markets Group, LSE, July.
- Benston, G. J., Kaufman, G. G. (1998).** Deposit Insurance Reform in the FDIC Improvement Act : The Experience to Date. In: Economic Perspectives. Federal Reserve Bank of Chicago, Second Quarter, 2–20.
- Bruni, F. (1990).** Banking and Financial Reregulation Towards 1992: The Italian Case. In: J. Dermine (ed.). European Banking in the 1990s. Basil Blackwell, Oxford.
- Bruni, F. (1999).** The independence of the ECB and its Political and Democratic

- Accountability. In: Louis and Bronkhorst (eds.). *The euro and european integration*. P.I.E.-Peter Lang, Brussels, 183–198.
- Bruni, F. (1997)**. Central bank independence in the European Union. In: I. Kuroda (ed.). *Towards More Effective Monetary Policy*. Macmillan, London, 341–386 (including comments by R. Raymond, C. E. Minehan and C. Briault).
- Bruni, F., de Boissieu, C. (1999)**. Lending of Last Resort and Systemic Stability in the Eurozone. Financial Market Group, Mimeo, LSE, October.
- Bruni, F., Paternò, F. (1995)**. Market Discipline of Banks' Riskiness: A Study of Selected Issues. In: *Journal of Financial Services Research*, 9, 303–325.
- Bruni, F., Penati, A., Porta, A. (1988)**. Financial Regulation, Implicit Taxes and Fiscal Adjustment in Italy. In: *Fiscal Policy, Economic Adjustment and Financial Markets*, International Monetary Fund and Centre for Monetary and Financial Economics "Paolo Baffi", Milano.
- Cameron, R. (1967)**. *Banking in the Early Stages of Industrialization*. Oxford University Press, New York.
- Cecchetti, S., Genberg, H., Lipsky, J., Swadhwani (2000)**. Asset Prices and Central Bank Policy. In: *International Centre for Monetary And Banking Studies*, Geneva, June.
- Crockett, A. (2000)**. In search of anchors for financial and monetary stability. 22nd SUERF Colloquium, Mimeo, Vienna, April.
- Dale, R. (2000)**. Deposit Insurance in Theory and Practice. In: *Journal of Financial Regulation and Compliance*, Vol. 8, No. 1, February, 36–56.
- Davis, E. P. (2000)**. Financial stability in the euro area: some lessons from US financial history. 22nd SUERF Colloquium, Mimeo, Vienna, April.
- Deane, M., Pringle, R. (1994)**. *The Central Banks*. Hamish Hamilton, London.
- De Bandt, O., Davis, E. P. (1999)**. A Cross-Country Comparison of Market Structures in European Banking. In: *Working Paper Series*, No. 7, European Central Bank, September.
- Demirguc-Kunt, A., Detragiache, E. (1999)**. Does Deposit Insurance Increase Banking Stability? An Empirical Investigation. IMF Working Paper.
- Diamond, D. W., Dybvig, P. (1983)**. Bank runs, deposit insurance and liquidity. In: *Journal of Political Economy*, 91, 401 to 419.
- Di Noia, C., Di Giorgio, G. (1999)**. Should Banking Supervision and Monetary Policy Tasks Be Given to Different Agencies? In: *International Finance 2:3*, Blackwell Publishers Ltd., Oxford, 1–18.
- (The) Economist (2000)**. Central banks, all a-quiver; May 13, 77–78.
- European Shadow Financial Regulatory Committee (ESFRC) (1998)**. Statement no.1, Brussels, June 22.
- Favero, C., Freixas, X., Persson, T., Wyplosz, C. (2000)**. One Money, Many Countries, Monitoring the European Central Bank 2. CEPR, January.
- Goodfriend, M., King, R. G. (1988)**. Financial Deregulation, Monetary Policy and Central Banking. In: *Economic Review*, Federal Reserve Bank of Richmond, vol. 74/3 (May/June), 3–22.
- Goodhart, C. (1988)**. *The Evolution of Central Banks*. MIT Press, Cambridge.
- Goodhart, C. (1995)**. Price Stability and Financial Stability. In: Sawamoto, Nakajima and Taguchi (eds.). *Financial Stability in a Changing Environment*, St. Martin's Press, Macmillan, London, 439–509 (including comments by H. Bockelmann, F. Bruni and J. Jordan).
- Goodhart, C., Shoenmaker, D. (1992)**. Institutional Separation Between Supervisory and Monetary Agencies. In: *Giornale degli Economisti e Annali di Economia*, settembre-dicembre, 353–439.
- Grilli, V., Masciandaro, D., Tabellini, G. (1991)**. Political and Monetary Institutions and Public Financial Policies in the Industrial Countries. In: *Economic Policy*, 13, 341 to 392.
- Jacklin, C. J., Bhattacharya, S. (1988)**. Distinguishing panics and information-based bank runs: welfare and policy implications. In: *Journal of Political Economy*, 96, 568–592.

- Lane, T. D. (1993).** Market Discipline. In: IMF Staff Papers, 40 (1), March, 53–88.
- Lannoo, K. (2000).** Challenges to the Structure of Financial Supervision in the EU. 22nd SUERF Colloquium, Mimeo, Vienna, April.
- Milhaupt, C. J. (1999).** Japan's Experience with Deposit Insurance and Failing Banks: Implications for Financial Regulatory Design. In: Monetary and Economic Studies, Institute for Monetary and Economic Studies, Bank of Japan, Vol. 17, No. 2, August.
- Padoa-Schioppa, T. (1999).** EMU and Banking Supervision, Mimeo. In: Lecture at the London School of Economics, Financial Market Group, February 24.
- Peek, J., Rosengren, E. S., Tootell, G. M. B. (1999).** Is Banking Supervision Central to Central Banking? In: Quarterly Journal of Economics, 629–653.
- Vives, X. (2000).** Banking Supervision in the European Monetary Union. 22nd SUERF Colloquium, Mimeo, Vienna, April.

Monetary policy in the new millennium – a Japanese perspective

Introduction

Last year, we saw one of the most important milestones in central bank history – the creation of the euro by the eleven central banks in Europe. Now, we are about to enter the 21st century, under the echoes of this impressive finale to the 20th century. In this context, I cannot think of a better theme for an economic conference than that selected by the Oesterreichische Nationalbank for today, “The New Millennium – Time for a New Economic Paradigm.” I am, therefore, much excited to participate in the discussions today, and would like to thank Governor Liebscher and his colleagues at the Oesterreichische Nationalbank. To discharge my responsibilities, I will try to be as frank as I can in presenting you with my personal views.

Given the increasing speed of changes in the Internet age, one year’s changes would amount to changes over seven years in the pre-Internet age. This would mean that during the next one thousand years, there could be changes equivalent to what happened in seven thousand years, i.e., practically the whole history of civilization. Just as the prophets in ancient civilizations could never have dreamed of the Internet, any predictions I might make on the new millennium would be totally incomplete. Furthermore, when I try to speculate on the future of central banking, I am always reminded that the central bank is a relatively new invention in the history of mankind. We had tax collectors, soldiers and policemen long before history books were written. According to my history book, money in the form

of gold coins was invented by the Lydians in seventh century B.C. Austria was established in 996, so she has entered her second millennium. On the other hand, Governor Bäckström’s Riksbank, the oldest central bank, is less than 400 years old. Monetary policy as we know is even younger. It dates back only to the last half of the nineteenth century even under the broadest of definitions. Being so young, central banking and monetary policy should continue to evolve dynamically as we enter the new millennium. But on the other hand, being so young could make them more vulnerable to changes.

So, today, I would focus on what I know best, the recent situation and some discussions in Japan, and try to pick up some insights into the policy choices in the new millennium.

The zero interest rate policy

The present monetary condition in Japan is extraordinary. There had indeed been times when *real interest rates* had been zero or even negative, but a zero *nominal rate* was unheard of until our announcement early last year. More specifically, from February last year, the Bank of Japan is supplying ample liquidity to financial markets and those yields in the overnight money market would remain practically around 0%. Imagining an extreme situation might be a good way of clarifying one’s thoughts. The extreme level of interest rates



in Japan, therefore, might make a good case study on some basic issues relating to monetary policy.

This “zero interest rate policy” was a response to the longest peacetime recession in Japan since the Second World War. The Bank of Japan is now committed to maintaining the “zero interest rate policy” until the Japanese economy has reached a stage where deflationary concerns have been dispelled; the commitment that low interest rates would be maintained, not just until the next meeting of the Policy Board, but until the Board is confident that the Japanese economy is on a self-sustained recovery path led by private demand. In other words, monetary easing would be maintained longer if recovery remains elusive. This commitment should have had a flattening effect on the yield curve as market participants expect that low interest rates would be maintained for some time.

This exceptional monetary policy of the Bank of Japan seems to have prevented the Japanese economy from falling into a deflationary spiral, and we are now seeing positive signs of an economic recovery. One leading indicator of investments, private machinery orders (excluding electric utilities and ships) have increased 4.9% in the first quarter of the year 2000. Reflecting such increases in final demand, industrial production is gradually increasing – up 0.8% in the first quarter¹) – and corporate profits and sentiment continue to improve.

But the fact that monetary policy had successfully supported the Japanese economy as intended does not mean that there are no other effects. Under the zero interest rate policy,

even if the Bank of Japan tried to provide additional funds to the market, they would remain in the interbank market, and would not fully permeate into the economy. Furthermore, even if the Bank tries to pump in more liquidity in its open market operations, offers are sometimes undersubscribed. Against this background, overnight interest rates, stuck at 0%, do not function well as a signal for channeling funds to where they are needed most. A corollary to this is the shrinking “call money” market, which now stands at JPY 28 trillion at the end of April 2000, down 40% from the outstanding amount five years ago.

Under a more normal financial environment, spreads would be determined as a function of credit risk and the availability of funds, i.e., liquidity risk. But if funding for banks is always readily available, banks can afford to ignore liquidity risk – if a borrower does not repay on schedule, backup funding would be readily available at practically no cost. In such a situation, banks would understandably be reluctant to begin calling in loans against problem borrowers as long as there is a slightest chance of an improvement in business outlook. This pattern of behavior is sometimes criticized as a case of moral hazard. We are paying costs for the support to today’s macroeconomy.

Recalling the monetary policy of the U.S. Federal Reserve in the early 1990’s, real interest rates then might have been zero or negative, which provided support to economic activity. Nevertheless, the nominal rates were positive and banks continued to face liquidity risk. I suppose that fact generated incentives for banks and other financial institutions to

¹ For other G-7 countries, the relevant figures are Canada +1.8%, U.S. +1.5%, Germany +0.7%, Italy +0.4%, France +0.3%, and U.K. –0.8%.

manage their portfolios in a more risk-sensitive manner, which enabled banks and other financial institutions to efficiently perform their intermediary functions.

The role of monetary policy

The zero interest policy forced us to reflect again on the relative role of the monetary policy in the economy. In the recent Japanese experience that I have just described, we have demonstrated that decisive monetary policy could be useful to prevent an economy from falling into a deflationary spiral.

However, we reconfirmed that the monetary policy is not well suited to influencing factors in the real economy that determine productivity and the growth potential of an economy. Such factors are being determined by the famous Schumpeter process of creative destruction. We know that economic growth in the United States has been quite robust for the last few years. A large part of this is said to result from productivity gains made possible by the full utilization of information technology in businesses. It should be noted, however, that the same technology has been available, almost concurrently, in Japan, where growth has been less. Certainly, the steady hands of the Federal Reserve have contributed significantly to the longest postwar boom by successfully preventing the overheating of the economy, but I don't think monetary policy itself was the driving force behind the innovations and their successful real-life applications. In that sense, the monetary policy cannot substitute structural change or structural policy.

I would pick up one more point of discussion concerning on the relative role of monetary policy. Many people claim, both in and out of

our countries, that our monetary policy should be eased further by purchasing long term government bonds, responding to the deteriorating fiscal position. But I personally believe this is at best a very misleading and maybe a very dangerous perception on the relationship between the monetary policy and fiscal policy. In a very stimulating work, Marvin Goodfriend, a staff of President Broadus at the Federal Reserve Bank of Richmond, explores the possibility of reflating the economy in a zero interest rate environment through massive purchases of government bonds by the central bank. I will not go into the details, but I should note one of Mr. Goodfriend's conclusions: The central bank would need to drain money to stabilize inflation after the economy recovers by selling long term bonds, and such operations could entail substantial capital losses in central bank accounts. Since the government must compensate such losses in some way, such an operation would amount to fiscal policy under a different guise. This means the monetary policy cannot always substitute the fiscal policy.

Challenges before the central bank

Does the above discussion mean that the new millennium would be a very unexciting time to be a central banker? I don't think so. If I may use a musical analogy in this city of music, monetary policy cannot play the role of prima donna or even the first fiddle, but it provides the base notes that beautiful harmonies are based upon.

As I noted earlier, monetary policy is a powerful tool at the disposal of central banks in maintaining price



stability, and I believe price stability continues to be a key factor in sustaining economic growth in the new millennium.

My best guess for the most important changes in the new millennium, which is doubtlessly not very much different from yours, would be the development of information technology, the advent of the “knowledge-based economy” and globalization. If the knowledge-based economy brings about higher sunk costs and lower marginal costs



in a wider section of the economy, the dynamics of the whole economy might change. Furthermore, globalization might result in stronger correlations between markets and less country specific risks – the worldwide concern over the “dot-com bubble” would be a good example. We central banks must cope with those changes when they think about the conduct of monetary policy.

Changing financial environment should have effects on the monetary policy operations of the central bank, which pose a different set of challenges to central banks in the new millennium. Central banks must reassess the effectiveness of their policy instruments, for example selection of counterparties and collateral requirements, and devise new ones if necessary.

Let me describe some changes that were implemented at the Bank of Japan in this context. Up until about ten years ago, the Bank of Japan made use of direct loans to commercial banks, along with other instruments, in implementing its monetary policy. Now, the framework has been changed, and we conduct operations in the open markets. The effectiveness of this approach

was enhanced by the termination of underwriting short-term government funding bills by the Bank of Japan in April 1999. Such bills are now publicly issued and the Bank of Japan utilizes the market in its daily monetary operations. As a result, the framework for day to day operations in Japan is now similar to that in many other countries. Furthermore, we also accept asset-backed securities as collateral. Such increasing emphasis on open market operations should enable the Bank of Japan to more effectively implement its monetary policy in the new millennium as the structure of financial markets continue to evolve.

Finally, the mode of central bank operations, including monetary operations, have incentive effects on the behavior of market participants. Our experience in the last 10 years told us the importance of this aspect. We should operate, not only accommodating the changing world, but in a way which stimulate market participants to behave efficiently and prudently in a changing environment. This would maintain and strengthen the functioning of the market and consequently the effectiveness of the monetary policy in the long run.

Conclusions

If central banks fail those tests, then they might become liabilities to continued economic growth in the new millennium.

As a consequence, these opportunities for candid exchange of experiences, views and ideas are invaluable for us central banks to remain accountable in discharging our policy responsibilities. I would, therefore, like to conclude my remarks by thanking the Oesterreichische Nationalbank again for organizing this exciting conference. ☛



ALLAN H. MELTZER



*David E. Altig presented the paper
of Allan H. Meltzer.*

ALLAN H. MELTZER
PROFESSOR,
CARNEGIE MELLON UNIVERSITY
AND AMERICAN ENTERPRISE INSTITUTE

The “New Economy” in the 1920s and the 1990s

In *The Constitution of Liberty* (1960) and other works, Friedrich Hayek explained the dynamics of economic change under capitalism. Unlike many of his contemporaries, Hayek saw the dynamics of change as far more important for economic welfare and for the survival of capitalism as a social and economic system than the proofs of static efficiency that attract mathematical economists. For Hayek, as for Schumpeter, the distinguishing feature of capitalism lies in the interrelation of freedom and progress.

We meet in Vienna, so it seems appropriate to begin my discussion of the 1920s and the 1990s by summarizing Hayek’s theory of change and commenting on its relation to the way in which change has occurred. Memories of the 1920s have faded, so I will recall some of the events of that decade, pointing out parallels with the 1990s. Then, as now, many of the innovations occurred in the United States, and

many of the problems originated there, so I focus my attention on the United States.

As is well known, the 1920s ended with the collapse of financial systems, a precipitate fall in prices on the New York Stock Exchange, and a long and deep recession. I will, therefore, discuss some differences between the 1920s and 1990s. The most important difference is in policy, particularly monetary policy.

Hayek on change

Hayek was one of the first to give information a prominent role in economic theory. A change occurs, perhaps at random, perhaps as a result of careful study of existing technology or institutions. The change is adopted willingly and increases welfare. Others, observing the change, recognize that the new circumstances have made other innovations feasible, so they introduce them. The initial and subsequent innovations make still other innovations feasible.

A central feature of this Hayekian process is that no one can foresee all of the ramifications of an innovation or plan the outcome. Freedom and a market economy are best able to direct the individual talents that spread the innovation far beyond the vision or plan of the initiator.¹) Freedom permits innovators to self-select and requires them to risk their own resources. Banking systems, venture capitalists, engineering schools, and other institutions may facilitate the process but, first, there must be an idea, a vision of how the new technology or arrangement works.

Major innovations are usually not a one-step or one person process. Repeatedly, one sees evidence of

the Hayekian process. New firms, new products, and new uses for existing products compete for attention. Some changes succeed; others fail, but some of those that fail often return in different form or at a different time. And the changes alter not just technology. Norms and customs adapt to the new technology.

Hayek was one of the first economists to emphasize the role of information, both costs of acquiring information and the value of information to the user. Many of today's most important innovations reduce costs of acquiring information, thereby permitting market economies to operate more efficiently.

The 1920s

The 1920s, like the 1990s, was a period of rapid change in the United States. Despite recessions in 1923 to 1924 and 1926 to 1927, real GNP rose at a 3.8% compound average rate from 1922 to 1929. Between 1922 and 1929, the number of registered passenger automobiles more than doubled, from 12.2 million to 26.7 million. The number of radios rose from 60,000 to more than 12 million, and the number of telephones in service – a 19th century invention – rose from 14.3 to 20 million (Historical Statistics, 1960).

It was a period of social change also. Women gained the right to vote. Family size declined, and more people lived in cities than in rural areas. Consumer installment credit permitted households to use anticipated future income to buy durables.

If the 1990s saw the successful transformation of the U.S. economy to the post-industrial age, the 1920s were part of the transition from an agricultural to an industrial

¹ Thomas J. Watson, head of IBM, is reputed to have said in 1943: "I think there is a world market for maybe five computers." And Ken Olson, President of Digital Equipment said in 1977: "There is no reason why anyone would want a computer in their home."

economy. Raw cotton was still the principal U.S. export in the 1920s, but manufacturing increased rapidly during the decade.

As in the 1990s, expansions in North America and Europe were at very different rates. By 1929, U.S. production was 63% above its pre-war level, Canada increased 45%, but Germany, the U.K., and France increased only 6%, 12%, and 30% above their 1913 levels (Department of Commerce, 1966). Capital flowed toward the U.S. for most of the decade as foreigners purchased U.S. securities. U.S. banks lent part of the money back, but the dominant flow of gold was toward the United States and later to France, after the franc stabilized in 1927 to 1928.

A commercial advertisement from the late 1920s helps to capture some of the atmosphere. The 1927 advertisement describes “a new era” in which companies would no longer have to close down to count their inventory. The new technology was a portable adding machine, an early improvement in information processing and management. The machines were not electrified, but they were considered a major innovation.

This bit of hyperbole is not the only feature that seems familiar. Improved inventory control is common to both the 1920s and the 1990s, as is the improvement in information processing. More relevant for this paper is what happened to stock prices. As examples, I use the shares of two “New Economy” companies of the 1920s, Burroughs and International Business Machines, later IBM Corp.

Price-earnings ratios for established “New Economy” companies were lower in the 1920s than recent ratios for Cisco Systems, Intel, AOL, and others in the 1990s. At its peak of USD 96 in 1929 (after a 5 for 1

split) Burroughs sold at 58 times its 1928 earnings and 41 times 1929 earnings. Earnings rose 41% in 1929, after relatively sluggish growth in the preceding years.

International Business Machines also shows a spurt in price during 1929. At its peak of 260, the stock sold at 29.4 times 1928 earnings and 23.6 times 1929 earnings. Earnings rose 25% in 1929 and at a compound rate of 17.5% from 1926 to 1929. Interestingly, IBM’s earnings increased in 1930 and



remained unchanged in 1931, while Burroughs earnings collapsed. The two stock prices reflect the difference in earnings.

The story could be repeated using other popular shares such as Radio Corporation (RCA) or some of the automobile companies. The data suggest that expected future earnings rose with current earnings, so price-earnings multiples increased with earnings, at least for the companies considered part of the “New Economy” of that day.

The stock market as a whole, however, does not show the positive correlation between reported profits and market capitalization in 1927 to 1929. As in the 1990s, optimistic anticipations appear to have been limited to a subset of publicly traded shares.

Chart 1 shows that the increased market capitalization of New York Stock Exchange (NYSE) shares occurred in 1926 to 1927. Capitalization approximately doubled over

Chart 1



the period 1925 to 1929, but most of the change occurred before the big stock market boom.

Two of the forces driving the rise in stock prices were the “New Economy” and increased economic stability. The former produced the stream of innovations in products and processes, described by Hayek. The latter made products and processes seem less risky. Together these forces gave rise to the anticipations of larger, less risky, streams of earnings that could justify higher market values and an increased capitalization rate on current earnings.

Then, as now, Federal Reserve policy and productivity growth worked together to heighten optimism. The Federal Reserve was a relatively new institution, founded at the end of 1913. The founders had hoped, or believed, that a properly run monetary authority could dampen fluctuations in interest rates and control inflation. The idea that a monetary authority should smooth fluctuations in employment and output was not an explicit goal at the time. Gold standard advocates, a group that included most officials, economists, and bankers, thought that the gold standard provided reasonable price stability.

In the twenty years before the Federal Reserve began operations, frequent panics caused banking and financial failures. With no committed lender of last resort, money market interest rates would reach as high as a 100% annual rate when the liquidity crisis was most intense.

The Federal Reserve was powerless to stop inflation after war started in Europe. It had few assets to sell and, under the gold standard, the gold inflow mandated inflation. Once the United States entered the war, the Federal Reserve helped to finance government spending, so it could not avoid additional wartime and postwar inflation. The policies it adopted to end inflation contributed to a severe recession and deflation in 1920 to 1921. There were recessions in 1923 to 1924 and 1926 to 1927 also.

To observers at the time, this record especially after 1921, represented an improvement over earlier experiences. Many country banks failed, but these were mainly banks that were not members of the Federal Reserve System. The prevalent view, based on experience in the 1920 to 1921, 1923 to 1924, and 1926 to 1927 recessions, was that the financial system avoided major

failures. Money market rates did not reach the extreme values experienced before 1913. Inflation remained low; the Federal Reserve had not produced either inflation or deflation, except in the war and early postwar years.

Confidence in the Federal Reserve System grew. In 1927, it received a permanent charter. The restoration of the gold standard increased public confidence in future stability. There was talk of a new era of prosperity without inflation, a less risky environment than had been known before.

Looking back from the 1960s, Friedman and Schwartz (1963) call the years 1923 to 1929 the high tide of the Federal Reserve System. It was the period with the most stable inflation and sustained economic growth in Federal Reserve history until the 1990s.

The 1920s and the 1990s

Are the two periods 1920 to 1929 and 1990 to 1999 similar? The answer is mixed. There are several similarities and some critical differences as well. Both periods had major changes in economic activity,

products and services. Both had low inflation, but this is truer of the 1920s than of the 1990s. Both had rapid increases in prices of common stocks.

Chart 2 compares the deflated values of stock prices in the two decades. The 1929 consumer price level is about 20% below the price level in the base period, January 1920; the 1999 consumer price level is nearly 40% above its base price level in January 1990. By deflating, I abstract from these changes.

There is a remarkable similarity in the broad movement of stock prices for the first 8½ years. In September 1928 and September 1997, the two deflated values, base 100 in January 1920 and January 1989, are 246 and 239. The close correspondence weakens after the middle of 1928 and 1997. By September 1929 and 1998, the difference in the two indexes is 100 points, 30% of the higher 1929 peak value. Thereafter the index for the 1920s collapsed. By the end of 1929, the deflated S&P index was back to the level first reached in September 1928 and fifty points below the value 69 years later of the same index in December

Chart 2

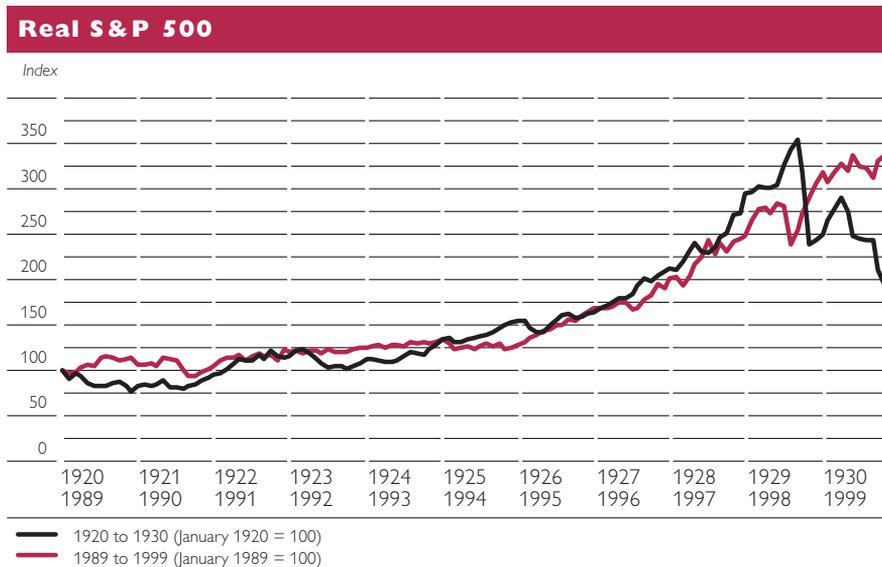
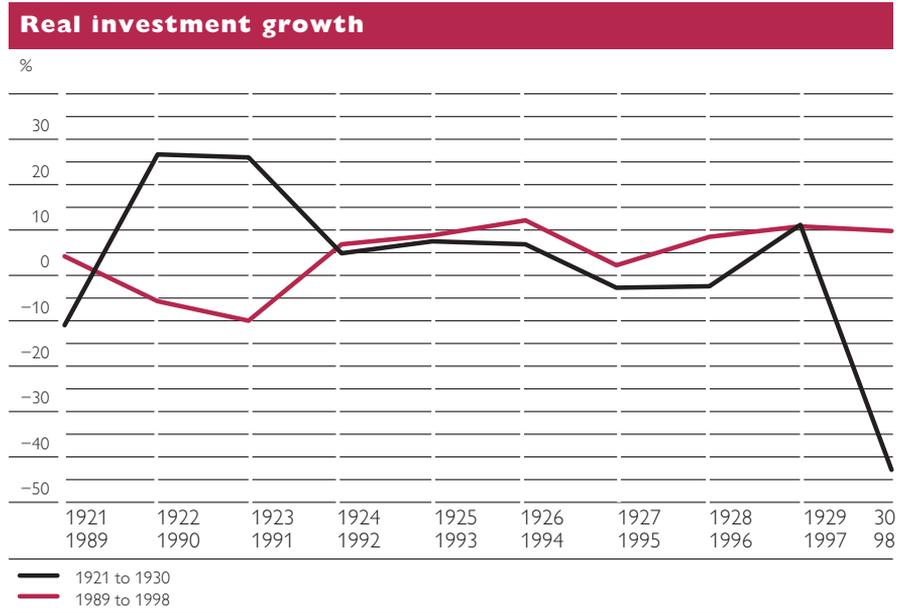


Chart 3



1998. The two series continue to diverge. The recent 30% decline in prices on the NASDAQ exchange is not shown on the chart and is not characteristic of the broader S&P index to date.

Much recent discussion emphasizes the effect of stock prices on consumption. In the Brunner-Meltzer (1976) framework, asset prices affect mainly investment. An increase in prices of existing assets relative to the price of new production increases the incentive to invest in substitutes for existing assets, so investment increases.

Chart 3 shows that investment was higher, on average, and less variable in the 1990s compared to the 1920s. The higher growth rate of investment in the 1990s may reflect more opportunities, more optimistic anticipations, faster growth of expected future corporate earnings, or more accurate data.

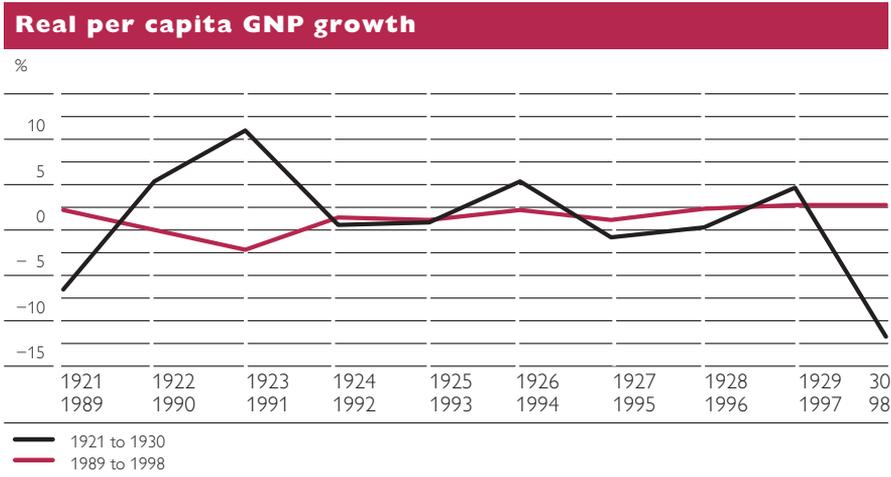
On average, per capita income rose faster, in 1921 to 1929 than in 1989 to 1997, but growth was less variable in the later period. Chart 4 shows that the averages for the two periods converge after the recovery

from the early postwar recession. At the times of the two stock market booms, at the end of both decades, average growth of per capita income is similar, so it seems reasonable to assume that expected growth of aggregate income was similar. Perhaps no less important, both periods show an increase in productivity growth with low inflation that encouraged belief in “a new era.”

The end of the 1920s and the 1990s also have fiscal surpluses in common. Treasury Secretary Andrew Mellon used the economic recovery and the reduction in military spending to generate surpluses in the 1920s. He used the surplus to retire outstanding debt and reduce income tax rates several times during that decade.

In the 1990s, reductions in defense spending and strong growth gradually closed the inherited budget deficit and produced budget surpluses at the end of the decade. The Treasury retired outstanding debt, but income tax rates rose in 1993 and remained largely unchanged through the rest of the decade. On a long-term view, how-

Chart 4



ever, the present value of future spending is much larger than the present value of future tax collections, the difference reflecting mainly unfunded liabilities for pensions and health care.

Differences, 1920s and 1990s

One important difference between the 1920s and the 1990s is the very different monetary policies of the two periods. Instead of a policy of maintaining the external nominal value of the currency, many countries in the 1990s emphasized stability of money's internal value.

The United States was on the gold exchange standard in the 1920s, on a floating exchange rate in the 1990s. Policy officials regarded restoration of the international gold standard as one of the major achievements of the 1920s decade, a return to tradition after wartime disruption and postwar inflation. Officials now regard the establishment of the Euro, with permanently fixed internal exchange rates and a common currency as one of the major policy events of the 1990s. Perhaps no less important for the future, many countries are now committed to a formal, or

informal, inflation target and a fluctuating exchange rate.

Restoration of the gold standard in the 1920s did not mean that countries followed the traditional rules. The United States sterilized gold inflows to prevent inflation. As in the 1960s, France did not like the gold exchange standard, especially the implication that France would hold its reserves in foreign exchange, instead of gold. French writers, and others, criticized the maldistribution of gold, a reference to the U.S.'s greatly increased holdings and increased share. Compared to 1913, the United States in 1927 had increased its share of the world's monetary gold stock from 28% to more than 40%. France's share had fallen from 15% to less than 10%.

Estimates of the world's gold stock are imprecise, but greater precision is unlikely to change three main conclusions:

1. by 1928, France restored its 1913 share of the world's monetary gold stock,
2. the combined U.S. and French shares rose from 43% in 1913 to more than 55% in 1929 and continued to rise thereafter, mainly as a result of French purchases, and

3. between 1926 and 1931, France increased its gold holdings by USD 2 billion, about 16% of the world's gold stock.

The French view of the period 1927 to 1929 is that purchases by the Bank of France “tended to establish a better balance in the world's distribution of gold” (Aftalion, 1931, p. 8). After the *de jure* stabilizations of the franc in June 1928, the Bank of France was no longer permitted to purchase foreign exchange. Foreigners had to pay in



gold. “It was hoped, however, that foreign banks of issue, by raising their discount rates, would prevent the flight of their gold to France.” France wanted countries to follow the rules and deflate. Writing soon after these events, Aftalion recognized the overvaluation of the franc, but he saw the solution coming principally from an end to British investment abroad, not a change in French policy (Ibid., pp. 8–10).

Despite the gold inflow, French wholesale prices, after declining rapidly in 1926, remained unchanged between the *de facto* stabilization in December 1926 and March 1929. In the next 18 months, wholesale prices fell 16%, a compound annual rate of 11% a year, somewhat faster than the price decline in the U.S. during the same period (League of Nations, 1932, p. 46; Aftalion, p. 10). Stable or falling prices reflected the policy of the Bank of France and the combined effect of increased demand for francs by

domestic and foreign holders following stabilization.

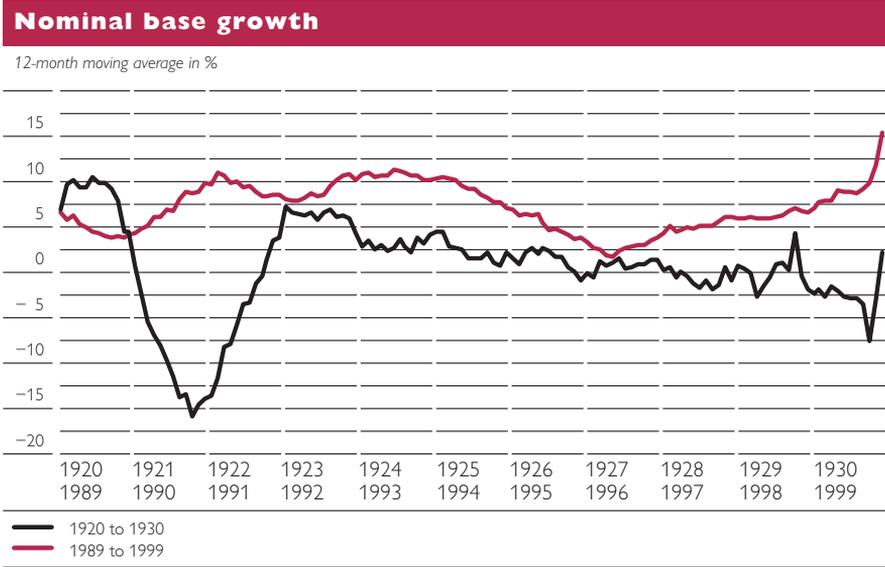
The law required the Bank of France to stop purchases of foreign exchange after June 1928. It did not require sales. French policy and French economic growth redistributed gold from the U.S. to France. France and the U.S. absorbed gold from the rest of the world. The redistribution toward France made the gold standard more deflationary after the French stabilization than before.

The French response to such criticisms denied the relevance of the quantity theory of money, linking prices to past or current changes in money and gold, and cast doubt on any effect of higher discount rates on price levels. The Bank of France kept its discount rate below the levels in other countries, and the government reduced taxes on sales of foreign securities in the French market to stimulate capital exports (Aftalion, 1931, pp. 11–13). But the Bank's sales of foreign exchange dwarfed any effect of these efforts.

The French policy of accumulating gold and selling foreign exchange sterilized much of the gold inflow to France. For countries losing gold the choice was deflation or departure from the gold standard. Eventually many of them chose to abandon the standard, but not before deflation had become a worldwide problem.

France was not alone in its deflationary policy. Chart 5 compares U.S. monetary policy in the 1920s and the 1990s, using growth of the monetary base as the measure of policy action. With a brief exception at the start of the period, monetary expansion in the 1990s is always above the value for the comparable month in the 1920s. The contrast is most apparent at the beginning and end of the decade. The deflationary policy in the 1921 recession con-

Chart 5



trasts with the expansive monetary policy in the 1991 recession.

The end of the period is our principal interest. In 1928 to 1929, monetary policy was deflationary; growth of the monetary base was well below the growth of income. In 1998 to 1999, policy was inflationary, base growth was much higher than income growth.

Rates of inflation in the two periods reflect the different monetary policies. This is especially true at the beginning and end of the decades. Severe deflation in 1920 to 1921 contrasts with inflation in

1990 to 1991. At the end of the decade, the data show a modest inflation of 1½% to 2½% in 1998 to 1999 in contrast to the modest deflation in 1928 to 1929.

Faced with gold sterilization and deflation or price stability in the U.S. and France, commitment to the gold standard became a commitment to deflation elsewhere. British experience shows the problem. Between April 1925, when Britain announced its return to the gold standard at its prewar parity, and April 1927, the British retail price index fell nearly 10%. Although Britain's gold hold-

Chart 6

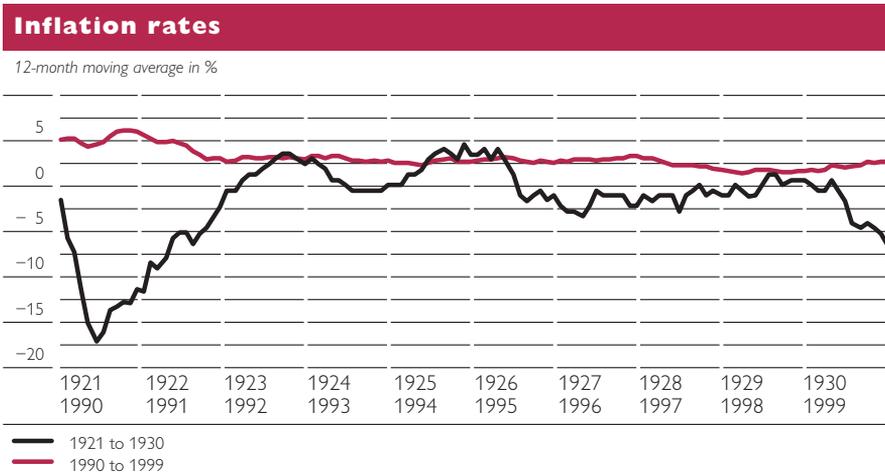
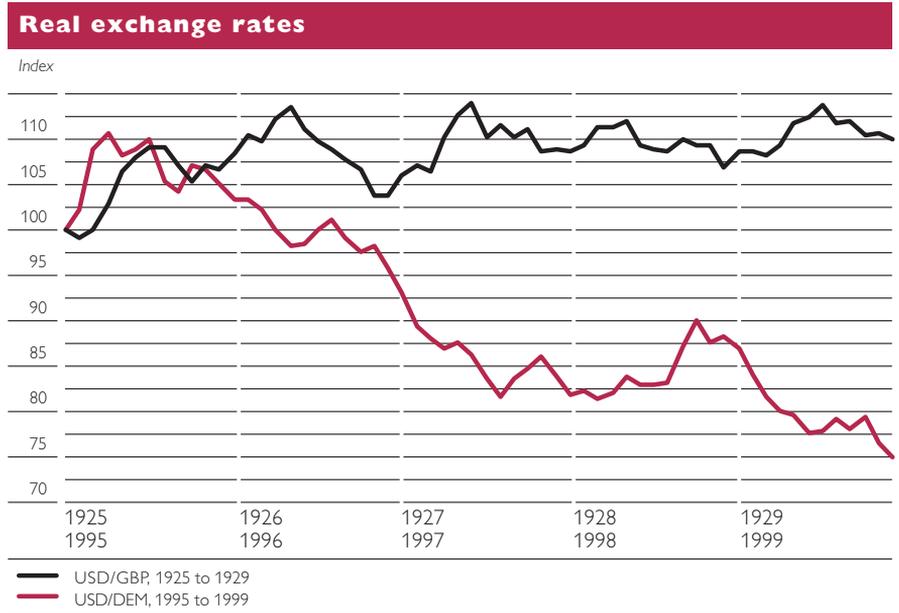


Chart 7



ings continued to fall on average, the retail price index remained in a narrow range. Britain did not deflate further in 1928 to 1929. Hence, the real exchange rate, dollars per pound, remained in a narrow range about 10% above the 1925 value in real terms; the pound appreciated against the dollar and other gold standard countries.

Britain had two alternatives, given U.S. and French policies and its own wage rates and production costs. It could reduce the real exchange rate by devaluing or deflating, or it could fail to act and accept the levels of output and employment implied by its wage level and fixed exchange rate. After experiencing a general strike that did not reduce wages, Britain accepted unemployment at 10% of the labor force. Attempts to expand by lowering interest rates caused foreign balances and gold to leave London, threatening the nominal parity.

Chart 7 compares the real exchange rate for the dollar/pound from 1925 to 1929 to the dollar/

mark rate for 1995 to 1999. The choice of currencies reflects the relative importance of the pound in the 1920s and the mark in the 1990s.

From 1997 to the end of 1999, the real value of the mark depreciated about 25% against the dollar. Other Euro-system currencies depreciated also. The depreciation reflects two contrary forces – the mark’s nominal depreciation and the greater increase in U.S. prices relative to German consumer prices.¹) From January 1995 through December 1999, the U.S. consumer price level rose 12%, the German price level about 6%. This change in the relative price levels was more than offset by the nominal depreciation of the mark. Most of the depreciation came in 1997. Recently real depreciation resumed.

Appreciation and depreciation are an adjustment mechanism that was absent under the gold standard. German (and Euro) exports now compete more effectively against U.S. products, strengthening growth

1 Nominal depreciation of the Euro and the mark in 2000 further increases the dollar’s real appreciation.

in Europe. Depreciation also helped the Asian economies to recover. Instead of deflating as in the 1920s, countries allowed their currencies to adjust.

In the 1920s, the United States had persistent trade and current account surpluses. It generally made net loans abroad and drew gold from the rest of the world. In the critical years at the end of the decade, the current account surplus equaled 1 to 1.5% of GNP. In the 1990s, the U.S. ran a large current account deficit, currently 3 to 4% of GDP, which it financed with capital inflows. Foreign households and businesses bought U.S. securities or made direct investments. The capital inflow permitted foreigners to share in the higher returns available on U.S. assets.

During the Asian crisis, and its aftermath, the adjustment mechanism worked to promote recovery. Asian currencies depreciated, so Asian exports expanded and imports fell. The U.S. stock market boom and rising productivity attracted private capital that financed net imports. The appreciation of the dollar, or depreciation of foreign currencies against the dollar, provided an adjustment mechanism superior to the more rigid system of the 1920s.

Must the current stock market boom and the new economy of the 1990s end with a bang as in 1929? If countries accept appreciation of their currency, as required, when the annual flow of capital to the United States slows and the U.S. current account deficit falls, the world economy can adjust. Attempts to present the adjustment of nominal exchange rates cannot prevent

adjustment of real exchange rates but can make adjustment more costly to all.

Then and now

Both the 1920s and the 1990s in the United States were decades with strong growth, rapid innovation, and a booming stock market at the end of the decade. While recognizing these similarities, the paper emphasizes an important difference – the choice of a fluctuating exchange rate instead of a fixed exchange rate



under the gold exchange standard.

Policymakers and many others in the 1920s believed that restoration of the gold standard was a major achievement of the decade. Some recognized, at the time, that the restoration of the gold standard increased the demand for gold. With the gold price fixed in nominal value, commodity prices had to fall.

Although countries accepted a common standard, they did not adopt policies compatible with the standard. Britain was unwilling to continue the restrictive policies required to lower domestic price and wage levels until they were consistent with its exchange rate and prices abroad. France wanted Britain to increase interest rates and deflate to slow or stop its loss of gold; it was motivated partly by classical gold standard reasoning, partly by its political aim of making Paris a financial center rivaling London. The U.S. and France drained gold from many of the other gold standard

countries, forcing them to contract, but both countries sterilized the gold inflow to prevent domestic inflation. With money wages slow to adjust downward, the international system had no way to make an orderly transition.

Clarke (1967) and others attribute the policy failures to insufficient cooperation among central banks. This charge is truer of France than of the United States, but it was not wholly true of either country. The Federal Reserve, principally the

decade, the U.S. was a net exporter in the 1920s. It did not lend back its entire surplus on current account. Instead, it forced deflation on the rest of the world by draining and sterilizing gold.

In the late 1990s, the principal countries had fluctuating rates – the dollar, the mark or Euro, and the yen. With most of Europe and Japan in a period of recession or slow growth, and part of Asia in deep recession, the U.S. absorbed net imports equal to 3% and now 4%

of GDP. It financed its current account deficit mainly by selling assets to the rest of the world. The supply of capital to the United States was large enough to appreciate the dollar despite the persistent, and rising, U.S. current

account deficit. Unlike 1928 to 1929, changes in the real exchange rate worked to adjust the world economy to the differences in growth in the U.S. and other countries.

The real depreciation of the Euro is part of this adjustment. With low inflation, the fall in the nominal Euro-dollar exchange rate works to reduce the heavy burden of the European welfare state in the principal European economies. With low inflation Euro-depreciation is a real change that reduces unit labor costs toward a more competitive level.

The U.S. current account deficit is widely regarded as unsustainable. That vague term may mean that the United States cannot expect to receive a capital inflow equal to 3 or 4% of GDP continuously. In that case, an orderly adjustment requires that either the real exchange rate depreciates in an orderly way or U.S. economic policy switches domestic spending to exports with-



New York Reserve bank as agent for the System, actively aided Britain and other countries to restore gold convertibility. It lent dollars to Britain and changed domestic policy in 1924, and again in 1927, partly for international purposes – to restore or maintain gold convertibility. These actions were always taken with an understanding, on both sides of the Atlantic, that cooperation would not be allowed to affect domestic inflation. The latter restriction meant that cooperation could not succeed. Exchange rates were misaligned, the pound overvalued, the franc undervalued. Ruling out inflation in the creditor countries and deflation in Britain left only one course – exchange rate changes – to adjust the system. These came much too late to maintain stability, given the continued deflationary policies in France and the United States.

Despite its strong economy and booming stock market at the end of

out either a recession, much higher inflation, or both. A recession would provide a temporary reduction in the trade deficit, not the permanent reduction suggested by unsustainability.

A swing of two points on net exports as a percent of U.S. GDP is about USD 200 billion. A significant share of U.S. imports are capital goods to support the increase in real investment. Slower growth of domestic demand, including less robust investment, would reduce import growth. A USD 200 billion swing in the U.S. current account, even if it is a very gradual change, would have a major effect on world trade and economic activity in many countries. It is difficult to foresee an orderly change of USD 200 billion without much more robust recoveries in Japan and Europe than now seems likely.

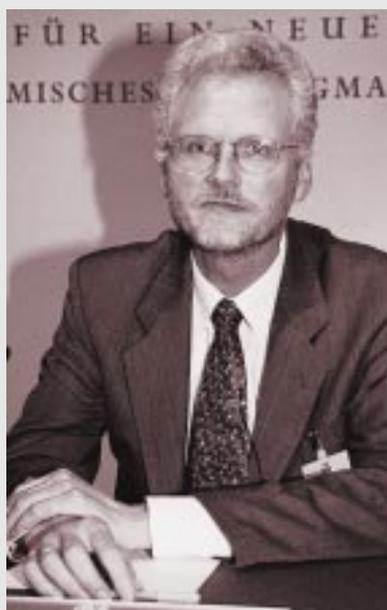
The lesson I draw is that the stock market received too much attention in 1928 to 1929, and it gets too much attention now. The stock market in the late 1920s, and the 1990s mainly reflected current and anticipated future earnings growth. The major problem in the 1920s was to end deflation. The major problem now is to adjust downward the historically high U.S. current

account deficit by shifting part of buoyant U.S. domestic output from domestic to foreign buyers without a recession. The U.S. is unlikely to succeed without more robust growth abroad. 

References

- Aftalion, A. (1931).** Selected Documents on the Distribution of Gold. League of Nation, Geneva.
- Brunner, K., Meltzer, A. H. (1976).** An Aggregative Theory for a Closed Economy. In: Stein, J. (ed.), *Monetarism*.
- Clarke, S. V. O. (1967).** Central Bank Cooperation, 1924–31. Federal Reserve Bank of New York, New York.
- Department of Commerce (1966).** Long-Term Economic Growth, 1860–1965. Washington Government Printing Office.
- Friedman, M., Schwartz, A. J. (1963).** A Monetary History of the United States, 1867–1960. Columbia University Press for the National Bureau of Economic Research, New York.
- Hayek, F. A. (1960).** *The Constitution of Liberty*. University of Chicago Press, Chicago.
- Historical Statistics of the United States (1960).** Government Printing Office, Washington.
- League of Nations (1932).** Report of the Gold Delegation of the Financial Committee, Geneva.

JØRGEN ELMESKOV



JØRGEN ELMESKOV
DEPUTY DIRECTOR, OECD
AND STEFANO SCARPETTA¹⁾
OECD

New sources of economic growth in Europe?

I Introduction

The conjunction of a number of economic developments in the United States has contributed to an impression that something fundamental may have changed in that country. These developments include: strong non-inflationary growth, coupled with high labour utilisation; the spread of information and communication technology (ICT); and micro-economic evidence of continued restructuring of production processes. Taken together, these developments have been seen as representing the emergence of a “New Economy.” At this juncture, the nature and dura-

1 Respectively, deputy director and principal administrator in the OECD Economics Department. This paper draws on collective work by a number of colleagues inside the Economics Department and has benefited from both direct comments and comments made in the context of other papers. We would like to thank, in particular, Andrea Bassanini, Michael P. Feiner, Phil Hemmings, Nick Vanston and Ignazio Visco, as well as Jackie Gardel and Sandra Raymond for secretarial assistance and Catherine Chapuis-Grabiner for statistical assistance. The views expressed in this paper are our own and should not be held to represent those of the OECD or its member governments.

bility of changes in the US economy remain uncertain. Equally, it is not clear to what extent similar patterns will spontaneously emerge in Europe.

This paper aims to shed some light on output and productivity growth over the 1990 to 1998 period, and attempts to identify the role played by traditional growth determinants as well as new forces largely related to ICT.¹⁾ In doing so, it will contrast US and European experience. It also aims to give some



pointers as to the policy settings which could help Europe to emulate the US experience.

The second section of the paper examines patterns of growth across the OECD area over the past decade and compares them with previous trends. The third section focuses on labour productivity, labour utilisation and the evolution of human capital. In the fourth section, the paper discusses the role of ICT as a driver of growth. The fifth section examines multi-factor productivity growth in an attempt to identify significant shifts in the rate of technological progress and, thus, in growth potential. The sixth section discusses the policy orientations

for European countries to emulate US performance and the final section sums up.

2 Growth patterns over the 1990s

International comparisons of recent productivity and growth patterns are constrained by a number of measurement issues. First, the focus of the New Economy discussion is on very recent developments for which data coverage remains limited. Second, despite major efforts by national statistical offices and international organisations, data problems still limit the possibility of comparing growth performance across countries and over time.²⁾ Among these difficulties, statistical methods differ in the extent to which production of and investment in computers is adjusted for quality changes. Third, output is notoriously difficult to measure in the service sector, which is a heavy user of ICT and where quality aspects of output are important. Finally, changes in trends are difficult to disentangle from cyclical developments at the best of times but particularly so when the focus is on the most recent observations. To control for these problems, this paper relies, where feasible, on cyclically-adjusted trend series.³⁾

1 The paper is adapted from the presentation of recent growth trends in OECD (2000a) and draws heavily on the more comprehensive analysis in Scarpetta et al. (2000) and Bassanini et al. (2000). More generally, the paper draws on evidence produced and interpretations made in the context of the OECD Growth Project, which was launched in 1999.

2 Comparability problems have always affected international analyses of growth performances but are particularly relevant at present because of the different pace and comprehensiveness with which different countries have adopted new measurement techniques in their national accounts (see Box I.3 in OECD, 1999a).

3 Trend series of output, employment and labour productivity have been estimated using an extended version of the Hodrick-Prescott filter (Hodrick and Prescott, 1997). The extended version of the H-P filter tries to overcome the well-known in-sample phase shift problem by extending actual data out of the sample using the observed average growth rate over the 1980 to 1998 period. However, if past growth rates are not reasonable proxies for future growth patterns, this extension may lead to a bias at the end of the filtered series. As a limited test of this procedure, the use of an alternative method of extending the data – using the projections in the OECD Medium Term Reference Scenario (MTRS) – provided broadly similar results for the majority of countries. There are, however, a few exceptions. In the case of Germany, France and Canada the use of OECD MTRS projections yields a somewhat higher trend growth rate over the 1990s; by contrast, they lead to a lower trend growth rate in output in Japan.

Table 1

Growth performance in OECD countries

	Actual growth of GDP				Trend growth of GDP		Trend growth of GDP per capita		
	1970 to 1980	1980 to 1990	1990 to 1998	1999	1980 to 1990	1990 to 1998	1980 to 1990	1990 to 1998	1995 to 1998
	Average annual rates of change								
US	3.2	3.2	3.0	4.2	2.9	3.1	2.0	2.2	2.7
JP	4.4	4.0	1.4	0.3	3.8	1.9	3.3	1.6	1.1
EU ¹⁾	3.0	2.4	1.7	2.3	2.3	1.8	2.0	1.5	1.7
OECD total ¹⁾ ²⁾	3.4	3.0	2.3	2.7	2.8	2.4	2.1	1.8	2.0

Source: OECD.

¹⁾ Growth rate for European Union and OECD total is computed as a weighted average of country growth rates, using country GDP levels expressed in 1993 EKS PPPs as weights.

²⁾ Excluding Czech Republic, Hungary, Korea and Poland.

For the OECD area as a whole, both actual and trend GDP growth were, on average, lower in the 1990s compared with the previous two decades, continuing the well-documented long-run slowdown in growth rates (table 1). However, while EU average growth continued to decline, the trend was reversed in the United States and in some smaller OECD countries (most notably Australia, Ireland, the Netherlands and Norway, see Annex table A1).¹⁾ As demographic changes are generally slow, trend growth rates in GDP per capita – which are more relevant from a living standard perspective – presented broadly the same picture (table 1).²⁾ On this measure, average annual growth in the United States was more than ½ percentage point faster than in both the EU and Japan over the 1990s.

Evidence for shorter periods of time needs to be interpreted with caution. With that caveat, there was some evidence of an acceleration in trend GDP per capita between the

first and the second half of the 1990s (only the period up to 1998 is considered). The increase in growth was quite strong for the United States but most EU countries also saw a rise. The main exceptions to this trend were Japan, Italy and Korea.

Reflecting these growth trends, data for 1998 show the United States at the top of the OECD income distribution followed by Norway and Switzerland with GDP per capita about 15 to 20 percentage points below the US level (figure 1).³⁾ The bulk of the OECD, including all the other major economies, lag behind per capita GDP in the United States by 25 to 35 percentage points. The European Union as a whole was about a third lower than US per capita GDP.

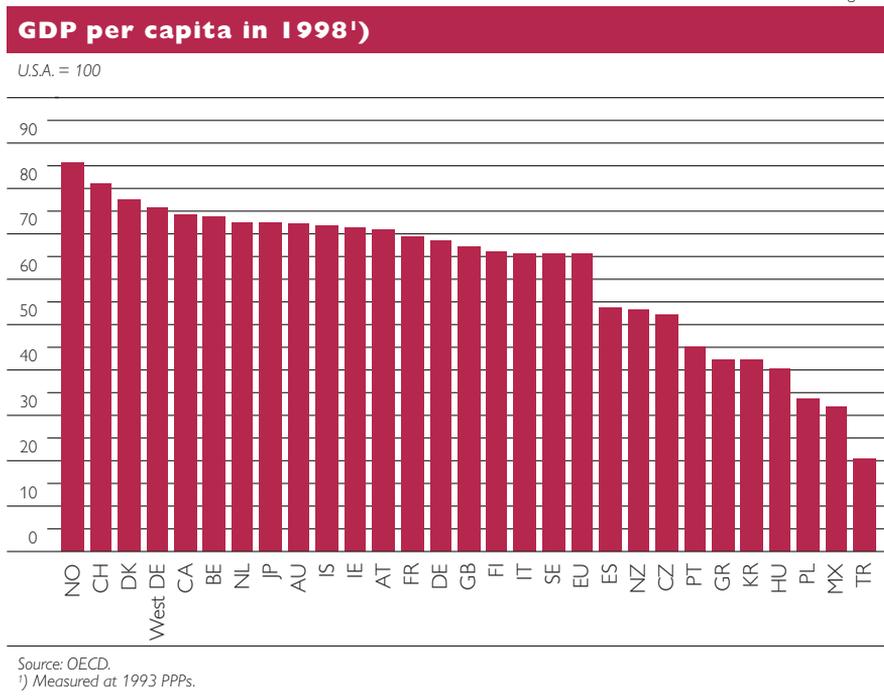
In the 1950s and 1960s many OECD countries grew rapidly towards the much higher US income levels, partly through imported US technologies and knowledge but also, in some cases, as a result of post-war reconstruction. The proc-

1 Denmark also figures in Annex table A1 with an acceleration in trend GDP growth. However, the data used in this paper do not include the latest (May 2000) revisions of the Danish National Accounts. These revisions suggest a somewhat slower GDP growth rate in the 1990s.

2 Strictly speaking, per capita GNP growth would be an even better measure, but in practice there is little difference between the two concepts in trend growth rates terms. There are, however, a few exceptions, including Switzerland and Ireland: for the former actual annual growth rate of GNP was 0.2 percentage point higher than the GDP growth rate (0.5%); for Ireland, it was 0.6 percentage point lower than the GDP annual growth rate (6.3%).

3 Luxembourg actually has higher GDP per capita than the United States but is a special case, not least given the size of the country, the role of the financial services sector and the importance of trans-border commuting.

Figure 1



ess of convergence slowed in the 1970s and 1980s, and considering both levels and growth rates, there are now only a few countries (e.g. Ireland, Korea) that seem still engaged in a process of catch-up to the United States. Indeed, strong US growth in the 1990s meant that the gap between its per-capita income levels and those of most other OECD countries started to widen again over the decade. These developments seem to contrast with some evidence of continued intra-EU convergence.

3 The role of labour

3.1 Demographics, labour productivity and labour utilisation

Growth in GDP per capita can be decomposed into three major components, comprising contributions to growth from demographic factors, employment and labour productivity. Concretely, figure 2 presents the contribution to per capita growth from:

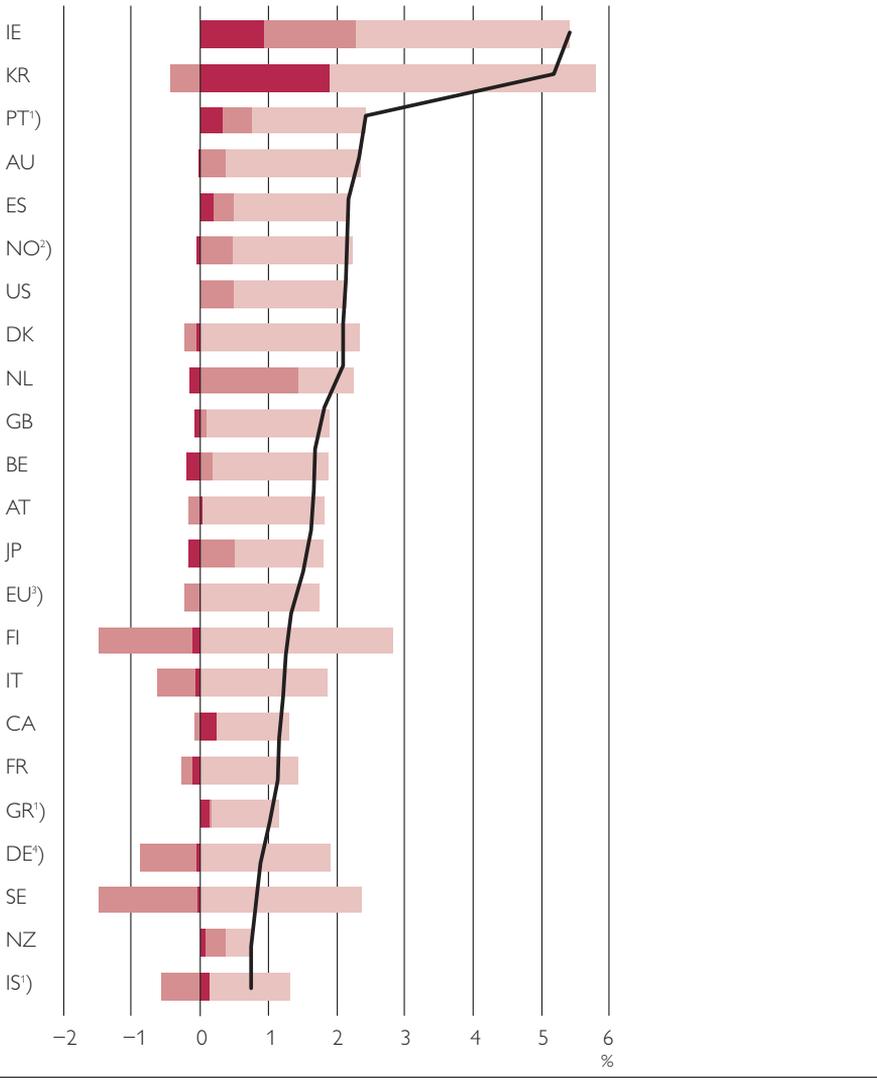
- a) the share of persons of working age (15 to 64 years) in the total population (the “demographic component”);
- b) the ratio of employed persons to the working age population (the “employment rate”); and
- c) labour productivity (measured per person employed).

For the vast majority of OECD countries, demography played only a minor role for trend growth in GDP per capita over the 1990s. The only countries where demographic change made a positive and significant contribution were Korea and Ireland, the latter having experienced a reversal in traditional migration flows in the 1990s (OECD, 1999c). However, in Japan and some European countries, demographic trends have begun (in this accounting sense) to act as a slight drag on growth in GDP per capita. This tendency is set to strengthen in the future again affecting mainly Europe and Japan within the OECD area – due to more rapid increase in the

Figure 2

Trend growth in GDP per capita and its components, 1990 to 1998

Average annual percentage change



— GDP per capita growth
 Contribution to GDP per capita growth from trend changes in:
 ■ Working-age population/total population
 ■ Employment/working-age population
 ■ GDP per person employed

Source: OECD.
 1) 1990 to 1997.
 2) Mainland only.
 3) Based on 1990 population weights.
 4) 1991 to 1998.

share of older persons in total population.

Rising labour productivity, defined as GDP per person employed, was the main contributor to per capita growth, accounting for

well over half of GDP per capita growth in most OECD countries over the 1990s. Compared with the previous decade, it picked up in a number of countries, including the United States, Germany, Australia,

Table 2

Average annual working hours

Total economy

	1980	1990	1998		1980	1990	1998
US	1,831	1,819	1,833	HU	1,930	1,710	1,788
JP	2,121	2,031	1,842	IS	..	1,772	1,747
DE	1,742	1,625	1,580	IE	..	1,922	1,797
West DE	1,742	1,611	1,562	KR	2,603	2,433	2,313
FR	1,792	1,652	1,599	LU	..	1,724	1,648
IT	1,724	1,674	1,648	MX	..	2,063	2,145
GB	1,704	1,613	1,587	NL	1,719	1,454	1,368
CA	1,805	1,790	1,768	NZ	..	1,676	1,681
AU	1,818	1,809	1,801	NO	1,512	1,432	1,401
AT	..	..	1,515	PT	..	1,882	1,732
BE	..	1,699	1,635	ES	2,003	1,824	1,821
CZ	..	..	2,003	SE	1,439	1,480	1,551
DK	..	1,492	1,527	CH	..	1,627	1,579
FI	1,755	1,677	1,674				
GR	..	1,912	1,930	EU	1,755	1,659	1,620

Source: Scarpetta et al. (2000).

Finland, Norway, Portugal and Sweden (see Annex table A1). However, for the European Union as a whole trend labour productivity decelerated, driven not least by the outcomes for France, Italy and Spain.

Since hours worked continued their trend fall in most countries over the 1990s (table 2), especially in Continental Europe, labour productivity growth was higher on a hourly basis than when measured on a head-count basis.¹) Declines in hours worked reflect both shorter statutory (or collectively agreed) working weeks as well as, especially in a number of European countries, a substantial increase in part-time work. Strong growth in part-time working has generally been associated with growing female labour-force participation (OECD, 1999b). The United States was a significant exception to the tendency for working hours to fall.

The 1990s witnessed striking differences in the evolution of employ-

ment rates. Indeed, different trends of employment rates were a main factor behind different outcomes for growth of per capita GDP. Amongst the major regions, increases in the United States and Japan contrast sharply with declines in the European Union. Even stronger contrasts are found between individual EU countries: strong upward trends in employment rates in Ireland and the Netherlands compare with declines in Finland and Sweden.

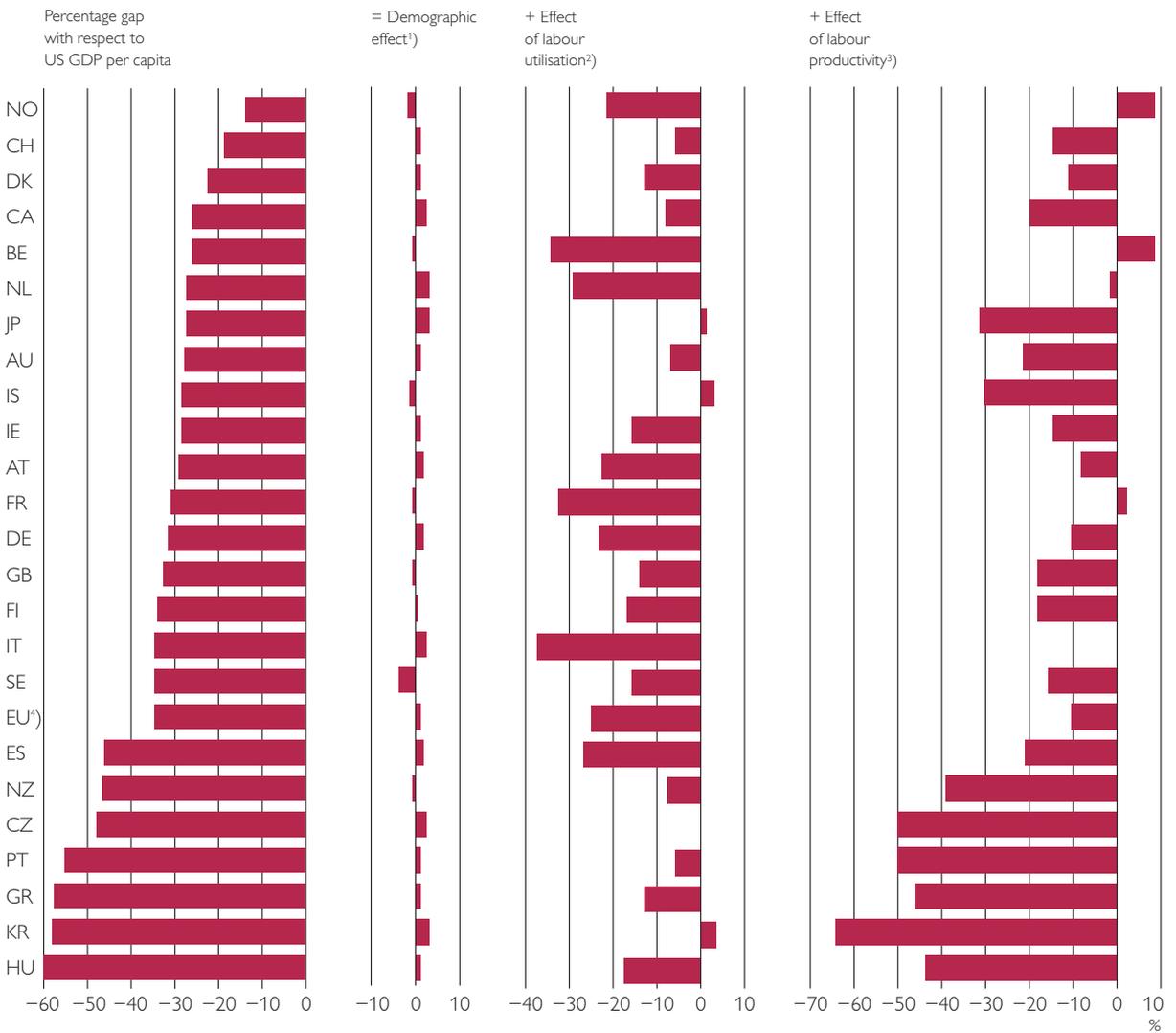
Labour utilisation is also an important factor in accounting for differences in the level of GDP per capita across countries. This is illustrated in figure 3, which suggests that for many countries lower labour utilisation (employment rates combined with hours worked) is the main factor behind a lower income level than the United States. For the EU as a whole, lower labour utilisation accounts for about three-quarters of the gap to US levels of GDP per capita. Low employment rates in some countries (e.g. Austria, Belgium, France, Germany, Italy and Spain), combined with relatively low hours account for more than 20 percentage points of the gap between their per capita output and that of the United States. The Nordic countries, by contrast, have even higher employment rates than in the United States, but this is offset by lower hours worked. At the bottom of the income scale, however, it is productivity rather than labour utilisation that accounts for most of the difference vis-à-vis the United States. Different demographic situations matter little in the overall picture.

1 It follows from the trends in hours worked that employment developed more weakly on an hourly basis than on a head-count basis. Thus, in terms of figure 2 the contributions from productivity would have been generally stronger and those from employment weaker had the decomposition been made in terms of hours the United States being the main exception.

Figure 3

Accounting for differences in GDP per capita in 1998

Percentage point differences in PPP-based GDP per capita with respect to the United States



Source: OECD.

¹⁾ Based on the ratio of working age population (15 to 64 years) to total population.

²⁾ Based on employment rates and average hours worked.

³⁾ GDP per hour worked.

⁴⁾ Based on 1998 population weights.

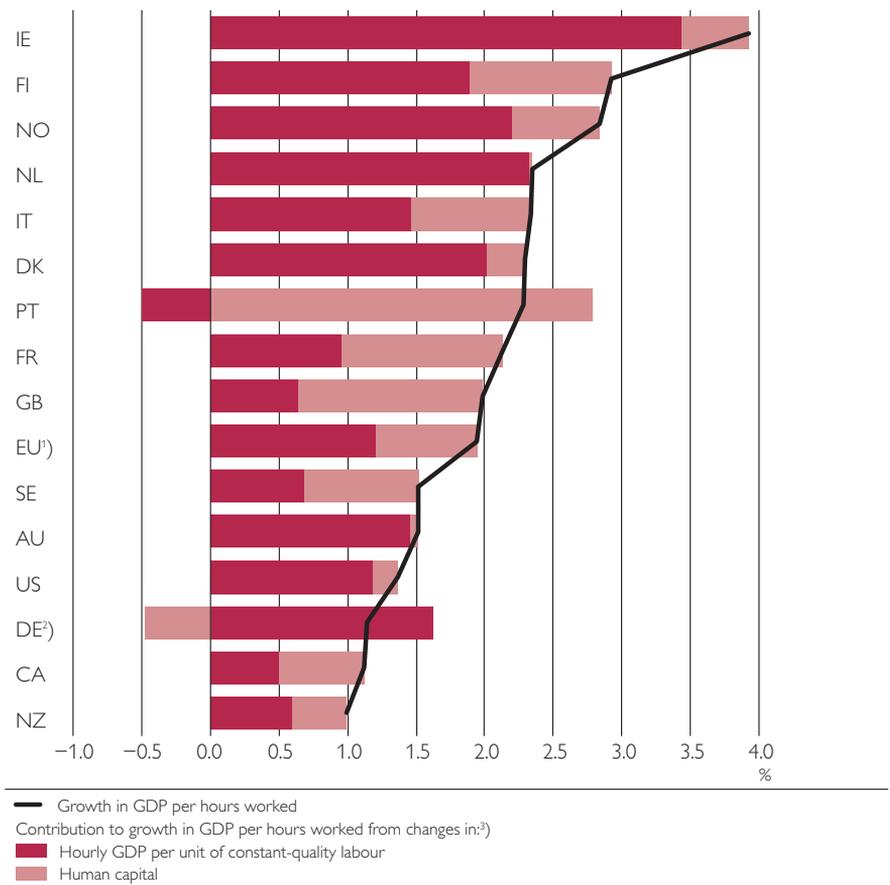
3.2 The role of skills and labour utilisation in labour productivity growth

Growth in output per employed person is partly attributable to increases in the average level of skills, or “human capital”, of those in employment. Figure 4 presents estimates of the impact of changes in the average

human capital of workers on growth in trend GDP per hour worked. The human-capital adjustment is based on a measure of labour input which sums groups of workers with different levels of formal education, each weighted by their relative wage. The rationale behind this measure is, first, that educational attainment

Figure 4

**Effects of human capital
on growth of hourly labour productivity, 1985 to 1996**
Average annual percentage change



Source: OECD.
 ¹) Based on 1985 employment weights of available EU countries.
 ²) Before 1991, data refers to Western Germany.
 ³) This is based on a simple quantitative decomposition: growth in GDP per person employed = labour productivity adjusted for hours and human capital + growth in human capital. Changes in human capital are proxied by changes in the education composition of employment, see main text.

accounts for a good proportion of human capital embodied in workers; and second, that relative wages between different levels of education provide a reasonable quantitative proxy for the relative productivity of workers with different levels of education.¹⁾ Given the secular increase in educational attainment in OECD countries, it is not surprising that for most countries human capital made a positive contribution

1 Data availability constrains the country coverage and the time period (1985 to 1998). Moreover, the need for crosscountry comparability made it necessary to rely on a somewhat crude classification of labour into six categories: by gender and by three educational levels (below secondary, secondary, and tertiary). In addition, workers are assumed to work the same number of hours across education levels and variation in relative wages over the period is not allowed for. It should be stressed that the assumption that wages reflect human capital is commonly made but, strictly speaking, only holds where firms operate under constant returns to scale in competitive input and product markets, and maximise their profits by equating compensation with each worker's contribution to output. The Bureau of Labor Statistics (BLS, 1993) discusses how deviations from these conditions affect the relationship between the contribution to output and compensation.

Figure 5

Human capital growth in total working-age population and in employment, 1989 to 1996

Percentage point change of the share of individuals with higher educational levels¹⁾ in total



Source: Calculations based on data from OECD, *Education at a Glance*, various issues.

¹⁾ Higher education levels refer to ISCED codes 5, 6 and 7.

²⁾ 1991 to 1996.

to growth in GDP per person employed;¹⁾ and as a corollary, “quality” adjusted growth rates in labour productivity are typically lower than those based on crude calculations. In terms of magnitude, the data suggest that in most countries rising average human capital accounted for between 0 and 1 percentage point of trend growth in GDP per hour worked.

Skill upgrading amongst workers seems to have been particularly marked in the major European countries, where it was accompanied by sluggish employment growth.²⁾ Indeed, productivity gains in many European countries were achieved in part by dismissing or not employing workers with low skills. By contrast in the United States, Australia, Denmark and the Netherlands, skill upgrading has played a relatively modest role in GDP growth per employed person. Improving labour-market conditions have widened the

employment base in these countries, especially in the 1990s, allowing low-skilled workers to get a foothold into employment.

In order to shed further light on this, figure 5 plots changes in the share of persons with upper-secondary education or above in employment against changes in their share in the total working-age population. While up-skilling among the employed is largely associated with a generalised improvement in the educational level of the working-age population (i.e. countries cluster along the diagonal in figure 5), there has been a general tendency for employment changes to be biased towards the better educated (most countries are located above the diagonal). However, this is not a generalised phenomenon: countries which maintained favourable labour-market conditions or experienced significant improvements have had a more balanced relative employment perform-

1 The result for Germany reflects the discrete fall in the average education level of the workforce because of the unification with the Eastern Länder.

2 From the discussion in the previous paragraph, skill upgrading should be interpreted as a shift in the composition of the workforce towards better educated workers, and not as an improvement of individual workers' human capital.

ance (they tend to be located at or below the diagonal in figure 5).

The relationship between overall employment levels, average human capital of workers and their average productivity is important for interpreting cross-country differences in GDP per capita. In terms of figure 3, the contributions of labour productivity and labour utilisation to GDP per capita are inter-related. First, non-employed people of working age generally have lower education levels – and thus potential productivity – than those in employment. Convergence towards the high US level of labour utilisation might therefore be associated with a drop in average productivity relative to the US level. Second, low employ-

ment may often reflect structural policies that boost real wages which give incentives to substitute capital for labour. If moves towards higher US employment levels arise in conjunction with lower real wages, the capital intensity of production might drop and, in consequence, labour productivity may decline.

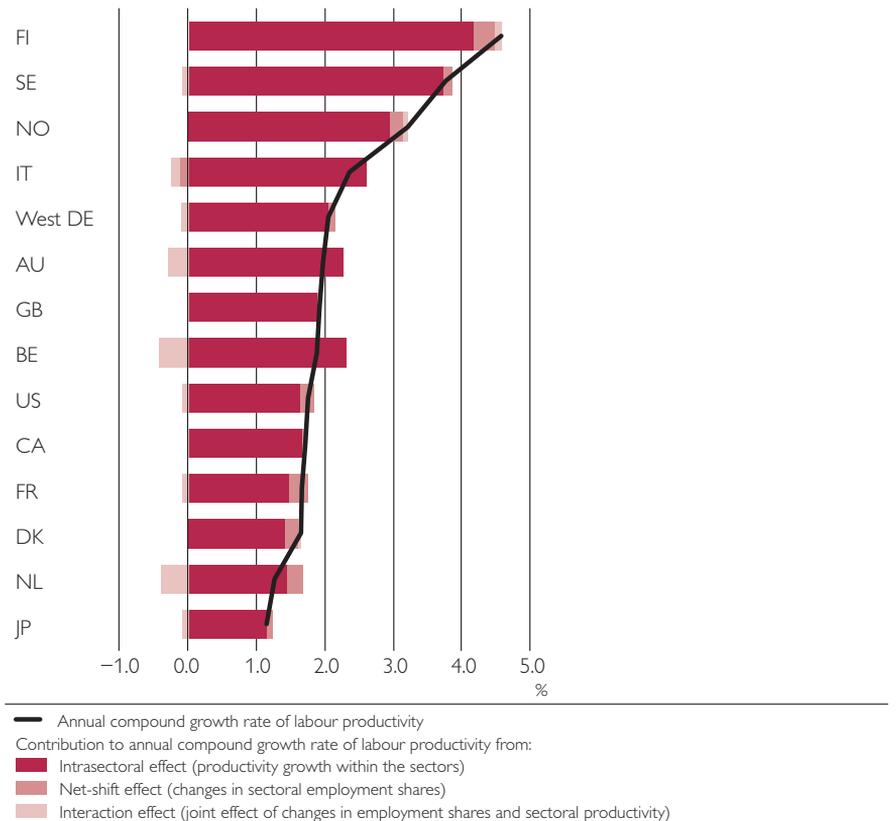
3.3 The role of sectoral shifts in aggregate labour productivity growth

In the past, shifts in employment from less to more productive sectors have often contributed significantly to overall growth in output and labour productivity. However, evidence for the 1990s suggests that the most important contribution to

Figure 6

The contributions of sector-shifts and intra-sectoral effects to overall labour productivity growth, 1990 to 1997

Non-farm business sector



Source: OECD.

overall productivity growth came from productivity changes within industries, rather than as a result of significant shifts of employment across industries. This is illustrated in figure 6, which shows a decomposition of labour productivity growth into a within-industry effect, a between-industry effect and an interaction effect.¹⁾ The within-industry labour productivity growth accounted for most of the overall productivity growth over the 1990s, although the rather broad industries used in the decomposition may have some bearing on the result.²⁾ The upshot is that explanations for observed productivity trends at the aggregate level have to relate to developments that affect individual industries.

4 The role of information and communication technology

Much of the current discussion about growth and the New Economy focuses on the role of information and communication technology (ICT). There are three main channels through which ICT can affect growth rates of GDP per capita:

- a) an acceleration of productivity in the ICT-producing sectors themselves and, despite what was said above about the limited role for shifts between broad economic sectors, a growing size of ICT-producing sectors in the economy;
- b) capital deepening across the economy, driven by rapid investment in ICT equipment, and resulting in a boost to labour productivity; and

- c) widespread spillover effects on productivity arising from the use of IC technology.

This section focuses on the first two contributions of ICT, while the third is discussed in the next section in the broader context of multi-factor productivity trends. The role of measurement in affecting the allocation of growth between these factors is also discussed in that context.

4.1 Productivity growth in the ICT-producing sector

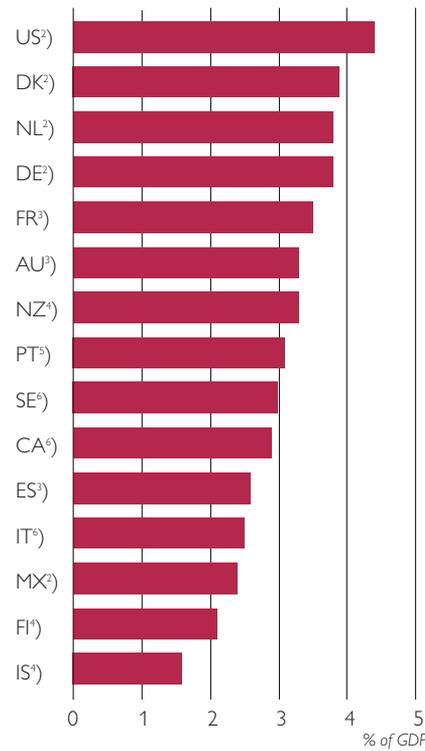
The share of the ICT sector itself in aggregate output remains small in most OECD countries (figure 7). Internationally comparable data on value added originating in the three principal segments of the ICT sector (but excluding software) show that it did not reach 5% of GDP in 1997 in any of the countries for which data are available. Higher contributions in some countries have been obtained using more comprehensive, but not internationally comparable, data (including inter alia software): On this basis, more than 7% of GDP in the United States and Japan is estimated to have originated in broadly defined ICT sectors. However, in most continental European countries, the ICT sector remains small even on an extended definition. Moreover, even a narrowly defined ICT sector includes segments and outputs that do not have any strong New Economy flavour. These arguments suggest that direct effects of productivity growth in the ICT sector on overall productivity are likely to be smaller in Europe than in the United States, at least for some time.

¹ A negative contribution from the interaction effect occurs when industries with growing relative productivity decline in size or when industries with falling productivity grow in size. The data are from the OECD ISDB-STAN database (2-digit ISIC for services and a 3- to 4-digit ISIC for manufacturing).

² The evidence of a strong within-industry contribution is, however, confirmed by firm-level studies. For a recent summary of firm-level data on productivity see Bartelsman and Doms (2000).

Figure 7

Share of ICT industries¹⁾ in total GDP, mid-1990s



Source: OECD (2000), *OECD Information Technology Outlook*, Paris.
¹⁾ Defined as ISIC Rev. 2 classes 3825 (Office and computing equipment), 3832 (Radio, TV and communication equipment) and 72 (Communication services).
²⁾ 1996.
³⁾ 1997.
⁴⁾ 1995.
⁵⁾ 1993.
⁶⁾ 1994.

No matter how it is defined, the ICT-producing industry experienced a major surge in productivity in the United States, especially in the latter part of the 1990s.¹⁾ Notwithstanding the small share of ICT in total value added, this within-sector acceleration is estimated to have raised labour productivity growth in the US business sector as a whole by 0.2 to 0.3 percentage point in the 1995 to 1999 period compared with the first half of the 1990s.²⁾ Furthermore, there is preliminary evidence of strong productivity growth in the ICT-producing sector in other

countries. For example, the electronic equipment industry in Finland increased its share of total-economy value added from less than 2% in 1990 to more than 6% in 1999, with labour productivity growing at an average annual rate of 15%, and the sector contributing ¾ percentage point to annual GDP growth over the period 1995 to 1999. In assessing this evidence, it should be stressed that countries differ strongly in their statistical treatment of quality improvements in ICT goods (see box 1 and text below). Bearing this in mind, industrial statistics confirm

¹ For a description of the recent US experience, see also OECD (2000b).
² See Gordon (1999); Oliner and Sichel (2000); Council of Economic Advisors (2000).

Box 1

Accounting for quality changes of computers

The rapid pace of technological advance in the computer industry complicates the split of nominal changes into volume and price developments. Over the 1990s the standard microprocessor speed of personal computers has increased 16-fold, and both the standard storage capacity and the transmission speed have risen more than 200 times. With these quality changes in a basic personal computer, it is difficult to equate one unit today with one unit a decade ago or with an even more distant relative. There have been striking developments also in the price/quality characteristics of telecommunications equipment.

Different methods are applied to measure price and quantity developments in computer production and spending (see also Schreyer, 2000). They range from no effort to adjust for quality changes, over judgmental approaches to more complete quality adjustments with "hedonic" and similar methods. When no adjustment is made, the price index computed from the price per computer unit, and the quantity index is based on the number of units produced or sold. The "hedonic" method unbundles the market price of the computer into its most important technical characteristics, and prices each characteristic separately, using regression analysis. The "hedonic" price index is the average price of all the characteristics, and the quantity index is based on nominal values deflated by this price index. The large discrepancies in producer price developments in the office, accounting and computing equipment sectors across countries are likely to reflect to a large extent different methodologies. Thus, the sharp measured drop in prices of such goods in the United States reflects the use of "hedonic" methods. By contrast, the modest fall or even increases in producer prices of office, accounting and computing equipment in many European countries may be due to the predominant "conventional" methods in deriving price indices. This suggests that quantities produced, and productivity trends, in the office, accounting and computing equipment sector are under-estimated in these countries. If computer prices are upward biased, a downward bias enters volume measures, such as real investment or consumption. The extent to which overall GDP measures are affected depends on the importance of a country's ICT industry, and on its propensity to import ICT equipment.

Producer prices of office, accounting and computing equipment

1999, 3rd quarter, as a percentage change from 1995 average



Sources: OECD Indicators of Industrial Activity; US Department of Labor.

Note: With the exception of the United States, the data come from OECD Indicators of Industrial Activity.

Data for the United States are weighted averages of producer prices for electronic computers, and office and store machines and equipment.

that labour productivity in the two sectors most heavily engaged in the production of ICT equipment (office, accounting and computing equipment; and radio, television and communications) typically rose significantly faster than in the manufacturing sector at large, especially in the latter part of the 1990s (table 3).

4.2 Falling prices of ICT equipment and capital deepening

Capital deepening is the second channel through which ICT affects output and labour productivity. Technological progress has mani-

festated itself, in part, through falling prices of ICT equipment (especially when prices are adjusted for quality, see box 1). When appropriate adjustment is made for quality improvements, annual declines in prices of IT equipment have typically exceeded 10%. The falling prices have not only induced substitutions from other assets to ICT equipment, but also increased the overall level of investment, i.e. led to capital deepening.

Investment in ICT equipment has increased tremendously across OECD countries. In the G-7 coun-

Table 3

**Labour productivity in manufacturing and two ICT sectors
in third quarter 1999**

	Office, accounting and computing equipment	Radio, television and communications equipment	Manufacturing
	1995 = 100		
US	460	172	125
JP	..	112	104
DE	186	129	117
FR	..	128	115
GB	160	..	103
CA	97	141	105
AT	116	134	130
DK	99	151	109
FI	127	193	119
KR	454	322	150
MX	117	144	119
PT	..	195	122

Source: OECD (1999), *Indicators of Industrial Activity*, No. 4.

tries, the share of IT capital goods in total investment expenditure rose steadily over the 1990s and by 1996, the latest year for which internationally comparable figures are

available, total non-residential gross fixed capital formation ranged from 4 to 6% in Japan and continental Europe up to 13% in the United States (table 4). The share of com-

Table 4

The evolution of investment in ICT, G-7 countries

	Canada	France	Western Germany	Italy	Japan	United Kingdom	United States
	%						
Share in non-residential gross fixed capital formation							
IT equipment							
1985	6.9	6.1	3.4	3.4	3.4	5.2	6.3
1990	7.3	5.0	3.5	4.1	3.8	7.5	8.7
1996	10.1	6.0	6.1	4.2	4.6	11.7	13.4
Communication equipment							
1985	4.2	4.0	3.7	2.4	0.8	5.2	5.8
1990	5.3	3.8	3.7	3.6	1.5	5.8	7.0
1996	6.1	4.9	4.8	5.4	3.5	6.6	6.5
Average annual rate of growth of constant price expenditure							
IT equipment							
1985 to 1990	+17.2	+16.2	+18.8	+20.8	+23.6	+25.5	+19.6
1990 to 1996	+17.6	+11.0	+18.6	+12.9	+14.5	+17.6	+23.8
Communication equipment							
1985 to 1990	+20.6	+19.0	+18.4	+25.6	+34.7	+20.3	+16.7
1990 to 1996	+ 4.3	+ 2.1	+ 3.4	+ 9.2	+15.0	+ 2.2	+ 5.1
Price deflator¹⁾							
IT equipment							
1985 to 1990	- 9.4	-10.2	-10.3	- 8.1	-12.0	- 6.7	-10.4
1990 to 1996	-11.1	- 9.2	-10.7	- 9.1	-12.5	- 9.1	-11.5
Communication equipment							
1985 to 1990	1.3	0.5	0.4	2.7	- 1.3	4.0	0.3
1990 to 1996	- 0.7	1.2	- 0.4	1.3	- 2.2	1.2	- 1.1

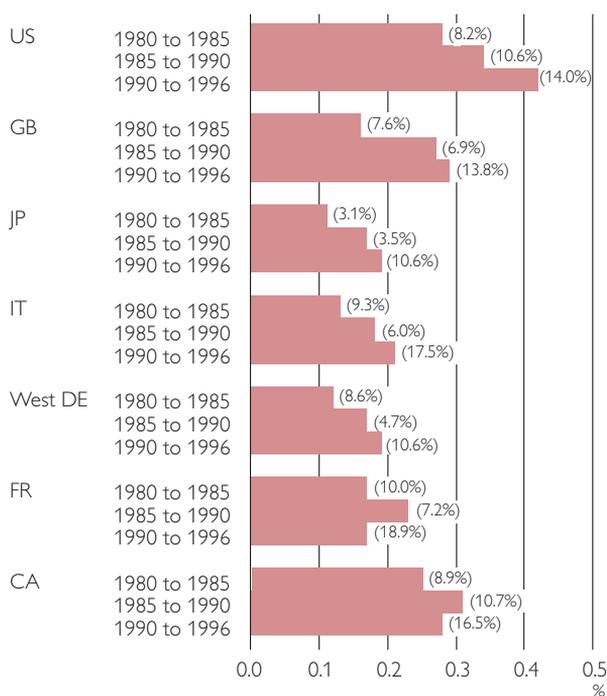
Source: Schreyer (2000).

¹⁾ Figures refer to harmonised deflator indices based on the assumption that the differences between price changes for ICT capital goods and non-ICT capital goods are the same across countries.

Figure 8

The contribution of ICT capital to output growth

total industries, based on harmonised ICT price index



■ Percentage point growth in output due to ICT capital
 (...) % of total output growth

Source: Schreyer (2000).

munication equipment also rose, though less rapidly, and accounted for around 5% of total non-residential investment.¹⁾ Moreover, volumes of IT capital investment rose at annual rates ranging from 11% in France to 24% in the United States in the 1990 to 1996 period. Recent evidence for the United States points to an acceleration in IT investment to a growth rate of about 38% annually in the 1996 to 1999 period. The share of ICT (broadly defined to include also software) in US non-residential gross fixed capital formation amounted to almost 35% in 1999.

Strong investment in ICT has led to a rapid rise in the stock of ICT capital equipment. That said, high depreciation rates of ICT equipment have meant that the share of these goods in the total business sector capital stock has remained moderate – at 7% in the US in 1996 and less in most other countries (Schreyer, 2000). The sharply increasing ICT capital stock has made a rising contribution to overall output growth. During the 1980s, ICT capital (hardware only) accounted for only about 0.1 to 0.2 percentage point per year of trend business-sector output growth (figure 8).²⁾ The growth

1 The figures reported in table 4 are based on a harmonised deflator constructed on the assumption that the differences between price changes for ICT capital goods and non-ICT goods are the same across countries. See Schreyer (2000) for more details.

2 The output share of the ICT sector across the G-7 countries averaged only 1 to 3% (Schreyer, 2000).

contribution from ICT was relatively small since the already high rate of growth of ICT capital applied to a small base. In the first half of the 1990s the contribution of ICT capital to output growth increased in most countries, and particularly so in the United States where it reached 0.4 percentage point per year, corresponding to about 14% of total output growth.

More recent evidence for the United States (Oliner and Sichel, 2000) suggests that the contribution



of ICT to output growth in the non-farm business sector surged in the second half of the 1990s due to a strong acceleration in the rate of growth of ICT capital: In particular, the growth rate of hardware and communication equipment doubled in the 1996 to 1999 period as compared to the first half of the decade. The overall contribution of ICT capital (including software) to output growth was about 1.1 percentage points, i.e. more than a third, almost double that recorded in the early 1990s. Broadly consistent with these findings, despite some differences in methodology, Jorgenson and Stiroh (2000) found that the contribution from ICT capital services to growth in private domestic output doubled from 0.4% per year in the 1990 to 1995 period to 0.8% over 1995 to 1998. A further increase in the contribution from ICT capital to growth is also likely to have occurred in Europe in the second half of the 1990s, though from a lower level

and though it cannot be statistically supported at this stage. More generally, to the extent the fall in prices of ICT equipment is passed through to purchasers, Europe should be able to experience a rise in the intensity of ICT capital use with associated effects on labour productivity.

5 The role of multi-factor productivity

In addition to the effects that ICT has on output and labour productivity *via* the production and use of capital goods, ICT equipment can generate spillover or “network” effects in the economy. For example, the economic benefits of improved communication and access to information through the Internet do not all arise directly from quality improvements in the stock of individual computers but also from different – and more efficient – ways of organising production and sales (i.e. some gains from ICT are disembodied). These network effects and other disembodied aspects of technological change should, in theory, show up in estimates of multi-factor productivity (MFP) growth, i.e. the residual output growth once the direct contribution of changes in the quantity and quality of capital and labour are accounted for. In practice, however, the paper cannot apply this clear definition of multi-factor productivity for at least two reasons:

- a) quality and compositional changes in the labour force and the capital stock go beyond the applied breakdown into six categories of labour and six types of fixed capital and are therefore to some extent captured by the productivity residual; and
- b) for countries outside the G-7, available data do not even allow the assessment of the effects from compositional/quality changes in the capital

stock (including the effects of ICT) but, again, these are captured by the productivity residual.

5.1 MFP growth over the 1990s

Following these arguments, table 5 presents different measures of multi-factor productivity growth in the business sector for most OECD countries over the past decades. The first measure is computed as the residual growth after controlling for aggregate hours worked and the gross capital stock but not adjusting for changes in the quality of labour and capital inputs. This is the broadest measure of multi-factor productivity growth given that it incorporates not only disembodied techno-

logical progress, but also the effects of increased human capital per worker as well as changes in the composition of physical capital. The second measure corrects for the general rise in education levels among workers by using a quality-adjusted measure of labour input and therefore generally shows a lower growth rate of MFP. Finally, the third measure of the residual also takes into account changes in the composition of the capital stock input (obtained aggregating over six types of assets). This measure can be considered as a proxy for the truly disembodied technological progress, although the decomposition of both educational categories and capital assets is still very limited and thus does not cap-

Table 5

Estimates of multi-factor productivity growth rates in the G-7 countries¹⁾

(based on trend series time-varying factor shares)

		1980 to 1990	1990 ²⁾ to 1998 ³⁾	1995 to 1998 ³⁾	1990 ²⁾ to 1996
		Average annual growth rate in %			
US	MFP growth	+0.8	+1.0	+1.0	+1.0
	with control for human capital	+0.8	+0.8	+1.0	+0.9
	and composition/quality of physical capital	+0.6	..	..	+0.8
JP	MFP growth	+2.0	+1.6	+1.6	+1.5
	with control for human capital	..	..	..	..
	and composition/quality of physical capital	..	..	..	..
DE ⁴⁾	MFP growth	+1.6	+1.4	+1.5	+1.4
	with control for human capital	+1.6	+1.9	+1.3	+2.0
	and composition/quality of physical capital	+1.5	..	..	..
FR	MFP growth	+2.1	+1.1	+1.1	+1.1
	with control for human capital	+1.9	+0.7	+1.0	+0.5
	and composition/quality of physical capital	+1.5	..	..	+0.4
IT	MFP growth	+1.5	+1.2	+1.0	+1.2
	with control for human capital	+1.4	+0.6	+0.7	+0.5
	and composition/quality of physical capital	+1.3	..	..	+0.4
GB	MFP growth	..	+1.3	+1.4	+1.3
	with control for human capital	..	+0.5	+1.2	+0.5
	and composition/quality of physical capital	..	..	..	+0.3
CA	MFP growth	+0.4	+0.8	+0.8	+0.8
	with control for human capital	+0.4	+0.8	+0.8	+0.8
	and composition/quality of physical capital	+0.2	..	..	+0.4

Source: OECD.

¹⁾ For each country, the first line shows estimated MFP growth rate without control for composition/quality changes in labour and capital; the second controls for changes in the composition of labour; while the third also controls for composition/quality changes in physical capital.

²⁾ 1991 for Germany.

³⁾ 1997 for Italy and United States, 1996 for United Kingdom.

⁴⁾ Western Germany before 1991.

ture shifts occurring at a finer level of disaggregation.¹⁾ For the smaller countries, only the first two measures of MFP could be calculated (see Annex table A2).

Comparisons of the different MFP estimates in table 5 indicate significant variation amongst the G-7 countries. The United States and Canada recorded a recovery in MFP growth over the 1990s that reversed a longstanding downward trend.²⁾ Conversely, all measures of MFP growth rates decreased significantly in France and Italy. As a result, the narrow measure of MFP which may be interpreted as the impact of disembodied technical progress grew more rapidly in the United States than in the other G-7 countries over the first



half of the 1990s – a reversal of the situation in the 1980s.

In interpreting these MFP growth rates, the role of deflators for computers (described in box 1) need to be kept in mind. For the sake of cross-country comparability, the investment goods deflators used for deriving asset stocks for the narrow measure of MFP are all based on hedonic price adjustments for computers. As a result, investment and the capital stock are augmented by quality improvements of computers. This part of embodied technological

progress therefore does not show up in the narrow measures of MFP which, on the other hand, include a component corresponding to quality improvements in the flow of output from the ICT sector. By contrast, the broad measure of MFP is based on national investment series and therefore differs across countries as to whether it includes technical progress embodied in computers. For a country like Germany, which does not use hedonic price adjustment, the stock of computer capital is not quality augmented and broad MFP therefore includes embodied technological progress but does not include quality improvements in output from the ICT sector. For the United States, by contrast, the latter is included whereas the former element of technical progress does not show up even in the broad measure of MFP.

Figure 9 presents estimates for the United States to illustrate this effect. The indicator of disembodied technical progress corresponds to the narrow measure in table 5. The indicator of disembodied and embodied technical change was calculated in the same way, but the capital stock was calculated from investment series that did not include any quality augmentation.³⁾ As can be seen from figure 9, the embodied part of technological progress gave a significant and rising contribution to business sector MFP growth – get-

1 A number of assumptions were also made in computing capital stocks by asset, in deriving user costs expressions and in aggregating across assets. For example, particular effort was made to derive a set of internationally harmonised price indices (based on hedonic adjustments) for investment in the asset type “information and communication technology” (see Schreyer, 2000, for more details).

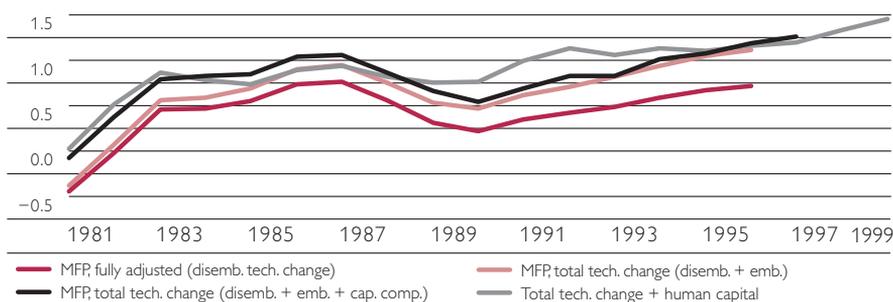
2 Germany also had somewhat higher MFP growth rates based on labour quality adjusted measures in the 1990s compared with the 1980s, although reversion to the mean can be observed in the most recent years. It should be stressed, however, that quality adjusted measures for Germany are somewhat less reliable because reunification implied a slump in input quality at the beginning of the 1990s that was subsequently recovered, without changes of equal magnitude on output.

3 Concretely, the German deflator for ICT was used as a benchmark to calculate this investment series because no hedonic adjustment is used in German statistics. While in principle output growth in computer manufacturing should also have been adjusted, no such adjustment was undertaken.

Figure 9

Different measures of MFP growth rates for the United States

Annual growth rate in %



Source: Bassanini et al. (2000).

ting close to ½ percentage point annually in the mid-1990s. The third indicator adds in compositional change in the capital stock and, consistent with table 5, this adjustment accounts for some 0.1 to 0.2 percentage point. The fourth and final indicator in figure 9 corresponds to the broadest MFP measure in table 5 i.e. the one that also includes changes in human capital – except that in figure 9 this measure is based on a capital stock without augmentation for computer quality.

The corrections for changes in the composition of labour inputs tends to reduce measured MFP insofar as part of the productivity growth is assigned to improvements in the quality of labour. These effects differ strongly in magnitude across the G-7 countries. Thus, improved human capital contributed fairly little to MFP growth in the United States and Canada but the decline in employment of low-skilled labour in France and Italy boosted the broad measure of MFP by about ½ percentage point annually. It should be underlined that the adjustment for changes in human capital is based only on changes in the educational

characteristics of the employed. Human capital may well have impacts on growth that go beyond this. For example, it may well be the case that the general *level* of education plays a role for how rapidly and efficiently ICT becomes integrated in the economy.

As concerns the smaller countries, MFP growth unambiguously and significantly increased in only a few over the 1990s compared with the previous decade. Thus, Australia, Finland, New Zealand, Norway and Sweden all experienced increases in average growth rates of MFP of at least 0.5 percentage point (in most cases from relatively low rates in the 1980s).¹⁾

5.2 US MFP growth in the most recent years

Particular interest attaches to developments in the United States over the most recent years. It should be stressed that trend series such as those used in table 5 could underestimate the pick-up in output and productivity that might have occurred towards the end of the 1990s. According to a very recent study (Jorgenson and Stiroh, 2000),

1 This was also the case in Denmark, but recent data revisions throw some doubts on this result.

the acceleration of MFP in the ICT industry in the second half of the 1990s was sufficiently strong to positively affect the economy-wide MFP growth rate in the United States, but the authors found little evidence of MFP spillover to ICT using sectors. Two additional studies (Whelan, 2000; Oliner and Sichel, 2000) relate the growing utilisation of computer hardware and software to faster aggregate MFP growth in the United States. Their estimates suggest an almost doubling in labour productivity growth in the 1996 to 1999 period as compared with the first part of the decade: The use of information technology and the production of computers accounted for about two-thirds of this acceleration. The crude MFP indicator in figure 9 is also suggestive of a pickup in growth towards the end of the 1990s. However, common to all of these studies is that they do not correct for cyclical influences which is a reason for being cautious in drawing conclusions.

5.3 MFP effects in ICT using sectors

With somewhat mixed trends across countries in aggregate MFP growth, and little direct macroeconomic evidence of disembodied technical progress as a result of ICT use, it is tempting to search elsewhere for such evidence. However, available data do not allow a clear identification of such effects in ICT-using sectors, partly reflecting measurement difficulties. In particular, there are serious problems associated with the recording of output in some of the industries using ICT most intensively. For example, measurement of the output of banks and financial institutions, which are heavy users of information technology, is generally regarded as poor, and any pro-

ductivity-raising effects of computers in these sectors could go largely unrecorded in national accounts.

More generally, it is difficult to assess the impact of innovative ICT-based businesses and markets, most of which are at an early stage of development. For example, any productivity gains from business reorganisation to take advantage of Internet and other networks are likely to become clearly visible only after a certain threshold in network use has been passed. However, there is anecdotal evidence that Internet – which became available for business use only in the mid-1990s – is now producing significant changes in several parts of the economy, especially in business-to-business transactions.¹⁾ Businesses are taking greater advantage of better real-time information systems, rationalising costly precautionary inventory stocks and the distribution of their products. Businesses have also started to reduce costs by integrating their suppliers more closely in the design and manufacturing of products. At the same time, anecdotal evidence suggest that tasks previously organised within hierarchical structures now may be the subject of market transactions with firms using the web to outsource tasks previously carried out internally. With greater information exchange between customers and producers, companies are likely to reduce labour hoarding required to meet unanticipated increases in product demand.

As regards business-to-consumer transactions (B2C), electronic commerce is still in its infancy and unlikely to have had much effect on aggregate productivity to date. In the United States, where most Internet transactions take place, they

1 See the chapter on electronic commerce in OECD (2000a).

Table 6

B2C e-commerce in selected OECD countries

	Value of transactions		Penetration rate	Number of buyers	Number of buyers	Number of buyers
	1999, USD million	growth rate (1999/98)	per cent of retail sales	thousand, end 1998	% of Internet users	% of working age population
US	24,170	195	0.48	19,666	39	11.1
JP	1,648	334	0.06	..	..	..
DE	1,199	200	0.30	1,370	13	2.4
FR	345	215	0.14	310	8	0.8
IT	194	145	0.09	360	12	0.9
GB	1,040	280	0.37	970	11	2.5
CA	774	166	0.26	811	12	4.0
AU	..	..	..	803	13	6.4
AT	96	210	0.23	120	13	2.2
BE	82	420	0.16	90	11	1.3
DK	46	220	0.20	90	8	2.5
FI	51	160	0.22	160	10	4.7
GR	..	..	..	30	11	0.4
IE	..	..	..	40	13	1.6
NL	182	210	0.34	320	13	3.0
NO	61	200	0.26	100	10	3.5
PT	70	185	0.06	50	11	0.7
ES	70	185	0.06	220	11	0.9
SE	232	170	0.68	260	10	4.6
CH	127	110	0.29	130	12	2.7

Source: OECD Secretariat; Boston Consulting Group; Warburg Dillon Read; Retail Council of Canada; MTI (Japan); and Australian Bureau of Statistics.

account for about two-thirds of 1% of retail sales (table 6). In Europe, and a few countries apart, B2C e-commerce is much lower still. Across sectors, it is really only in financial services, computer and software purchases, book-selling and event tickets, that B2C e-commerce has an important market share. Nevertheless, fast expansion in the future could have major effects on distribution efficiency and work to strengthen competition, with beneficial effects on productivity as well as on consumer choice.

6 Policies to strengthen European growth

Based on the evidence presented above, sensible people may disagree as to whether there is a “New Economy” in the United States. Perhaps it would be more accurate to say that there is strong evidence that the parameters in the old economy have

changed. Basically, labour productivity growth has been boosted by ICT in two ways: MFP growth in the ICT sector and substitution towards capital elsewhere. Evidence of spillover and network effects, boosting MFP in ICT using sectors, is so far scant – even if the recent up-trend in MFP growth may be seen as pointing in that direction. In any case, it is clear that something has happened in the United States but, a few countries apart, it is difficult to identify any tendencies for rising growth in Europe. The question is then whether there is some policy action that might enhance European growth. It will be addressed in two steps: focusing first on policies to raise employment and then on policies to maximise the gains from ICT. As it happens, policy orientations arising in the two areas appear to be either overlapping or complementary but not contradictory.

Table 7

		Evolution of capital stocks and capital intensities ¹⁾		
		1980 to 1990	1990 to 1998	1995 to 1998
		Average annual growth rate in %		
US	Capital stock	+3.0	+2.6	+3.3
	Capital/labour ratio	+1.1	+0.6	+1.0
EU ²⁾	Capital stock	+2.6	+2.5	+2.4
	Capital/labour ratio	+2.8	+2.7	+2.3
JP	Capital stock	+5.7	+4.2	+3.6
	Capital/labour ratio	+4.9	+4.7	+4.4

Source: Scarpetta et al. (2000).
¹⁾ The capital/labour ratio is adjusted for hours worked.
²⁾ Growth rate for European Union is computed as a weighted average of available EU country growth rates, using country GDP levels expressed in 1993 EKS PPPs as weights.

6.1 Raising the employment rate

To some extent, low rather than high productivity growth may be part of the solution to Europe’s problems. As argued above, strong past growth of labour productivity in Europe has come as a result of not employing the least productive workers and of a substitution towards capital forced by high labour costs. The skill-biased employment trend was illustrated by figure 5; table 7 illustrates the development in capital intensities in the United States and Europe. Raising the employment rate in Europe towards the US level, even at the price of some lowering of average productivity, would make a substantial contribution to the level of output which possibly could be in the same order of magnitude as any effects from a New Economy.

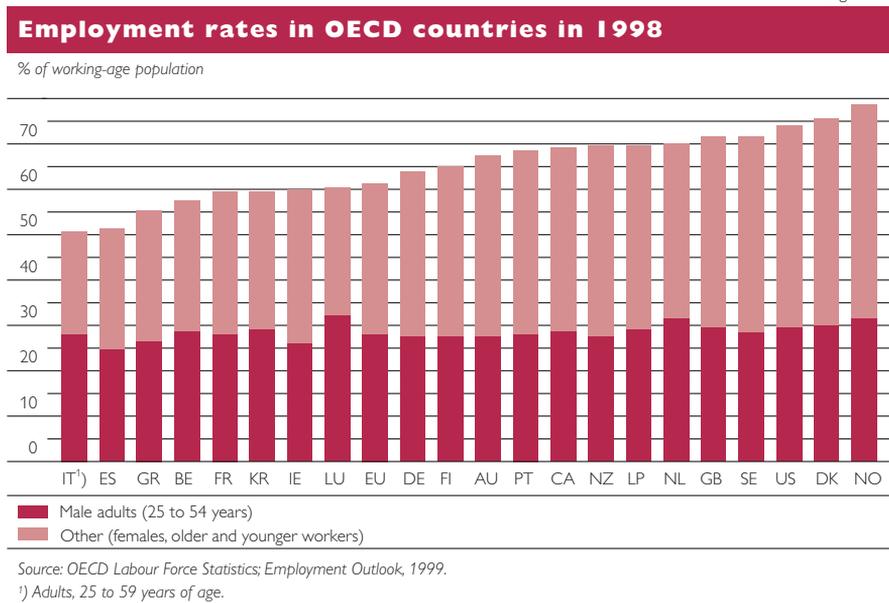
A thought experiment may illustrate the magnitudes. Lower utilisation of labour contributes more than 20 percentage points to the gap in GDP per capita in the European Union compared to that of the United States (figure 3). Even if

labour productivity at the margin is only half the average productivity level, the unwinding of a 20% gap in labour utilisation would lead to a level increase in GDP by 10%, or the equivalent of growth being about ½ percentage point higher over a 20-year horizon. This may not be much smaller than the growth contributions from some major technological breakthroughs in the past.¹⁾

An important aspect of Europe’s employment problem is illustrated in figure 10. Basically, the contribution to the overall employment rate coming from the core troops on the labour market – prime-age males – differs only little across countries. This reflects that this group tends to have high employment rates everywhere. By contrast, the typical outsiders – young, old and women – have much lower employment rates in continental Europe. The Nordic countries have relatively high employment rates for these groups but, as discussed above, labour utilisation is reduced by low working hours.

1 Gordon (2000) attributes the outstanding MFP growth in the period 1913 to 1972 to five major waves of inventions including the production and use of electricity, the internal combustion engine, the mastering of chemical processes, the entertainment, communications and information complex, and running water, indoor plumbing and urban sanitation. He sees these as responsible for annual MFP growth in the period being some 0.8 to 1.0 percentage point higher than in the surrounding periods. The implication is that these five waves raised MFP by some 60 to 80% over the period (the effects on output would have been augmented by impacts occurring via a larger capital stock, but more employment may also be associated with some capital widening investment). It follows that individual waves may have been of the same magnitude as the gains European countries might reap from approaching US levels of labour utilisation.

Figure 10



Raising employment rates among labour market outsiders will take concerted policies across several fields to stimulate both demand and supply at the bottom of the labour market as well as to maintain a high, sustainable labour demand more generally.¹⁾ There is some evidence that some of this is beginning to happen:²⁾

- A number of countries have either introduced or strengthened policies to make work pay (e.g. France, Belgium, Netherlands, United Kingdom). By either granting employment-conditional tax credits to low-wage employees or payroll tax rebates to employers hiring such people, governments are trying to strengthen supply and demand in this segment of the labour market. While these policy measures should not be oversold and may face diminishing mar-

ginal returns as they are expanded to wage earners higher up in the wage distribution, there is some evidence that they are effective (OECD, 1999a). That said, there is a question as to whether high wage floors remain a hindrance to the employment of marginal groups. This certainly seems to be the case for the impact of minimum wages on youth employment (OECD, 1998). More generally, public transfer schemes may in many cases act to truncate the wage distribution at the bottom.

- A number of countries have also eased up on some aspects of their employment protection legislation (EPL). This has mostly taken the form of easing conditions for fixed-term contracts and temporary work whereas few countries have eased up on EPL affecting permanent workers (Spain being

1 The recent US experience where a tight labour market has disproportionately benefited weaker groups suggests that aggregate labour market problems may be prone to show themselves more strongly at the bottom of the labour market.

2 An overview of recent labour market initiatives is presented in the chapter on recent labour market trends in OECD (2000a). A more general presentation of policies affecting labour market outcomes is given in OECD (1999b).

a notable exception). While the concentration of employment growth on flexible contracts suggests that these steps have been useful there is a real question as to whether easing on the margin can be a substitute for action affecting permanent workers. Apart from any considerations of unfairness in the discrimination between different groups, workers on permanent contracts tend to be more influential in wage setting and having a buffer of workers on flexible contracts may in fact increase the job security of permanent workers and thereby their wage-raising power.¹⁾

- Many countries have tightened up on eligibility rules for unemployment insurance (UI). There is some support for this having an effect on unemployment (Grubb, 2000). However, few countries have been prepared to touch the main parameters of UI – duration and level of benefits. Generosity on these parameters strengthens the bargaining position of labour-market insiders and tends to lengthen job search.²⁾ Moreover, UI schemes may interact with other structural features. For example, replacement income is usually based on past wages which implies that workers previously employed by firms with some market power may be compensated not just for not earning their market wage but also for a lost rent component – effectively leading to an excessively high replacement rate. But the

role of public transfer policies is more pervasive than just UI. Policies concerning retirement (including the prevalence of early retirement schemes) contributed to Europe in 1995 having an average effective retirement age of 61 against 64 in the United States (Blöndal and Scarpetta, 1998). In some countries, invalidity schemes also act as extensions of UI, and within UI schemes there are provisions which effectively eliminate any job search requirements on older workers. Moreover, early retirement schemes often include provisions barring labour market participation.

- Wage setting is a complex matter and recent wage outcomes in Europe may give rise to some hope of wage moderation. That said, unemployment has tended to be above estimated structural rates in many European countries in recent years and it is therefore not so surprising to see wage moderation – the question is whether we see more wage moderation than would be expected. Moreover, a number of particular institutions remain that are unfavourable to wage moderation. Thus, minimum wages remain high relative to average wages in a number of countries (above 50% in France, Belgium, Greece and Luxembourg) and the practice of administratively extending wage agreements to cover all workers/employers in one or more sectors remains (France is the extreme case with union mem-

1 *There is some evidence that EPL puts upward pressure on unemployment in particular in countries where wage bargaining institutions are such that individual unions have considerable bargaining power but do not take into account the economy-wide spillover effects of their bargaining stance (Elmeskov et al., 1998).*

2 *The effect of UI generosity is one of the most robust parameters in cross-country time-series regressions to explain unemployment (Scarpetta, 1996; Elmeskov et al., 1998).*

bership below 10% of the workforce but more than 90% of the workforce covered by collective agreements). Moreover, wage setting institutions may interact with other policy settings. Thus, there is evidence suggesting that increased payroll taxes have been particularly detrimental to unemployment in countries where wage bargaining institutions are prone to create real wage rigidity.

The above policies are far from the only ones that affect employment outcomes. For example, there is reasonably robust evidence that active labour market policies can play some positive role and policies affecting product market competition may also contribute. Tax policies obviously also affect labour supply. In sum, while some progress is being made more needs to be done and there is a fairly clear agenda for moving further on structural reforms. At the same time, there is some hope that with inflation now low and public budgets in better shape than they have been for decades, macroeconomic policies could be playing a more positive role than they have in the past.

6.2 The right framework conditions for a New Economy

Policy settings in many areas are important to foster growth in general but become even more crucial at times of rapid technological change because they increase the agility and dynamism of economies.¹⁾ Exploiting new IC technology calls for reinventing existing enterprises, discovering new business opportunities and starting new enterprises. Indeed, new enter-

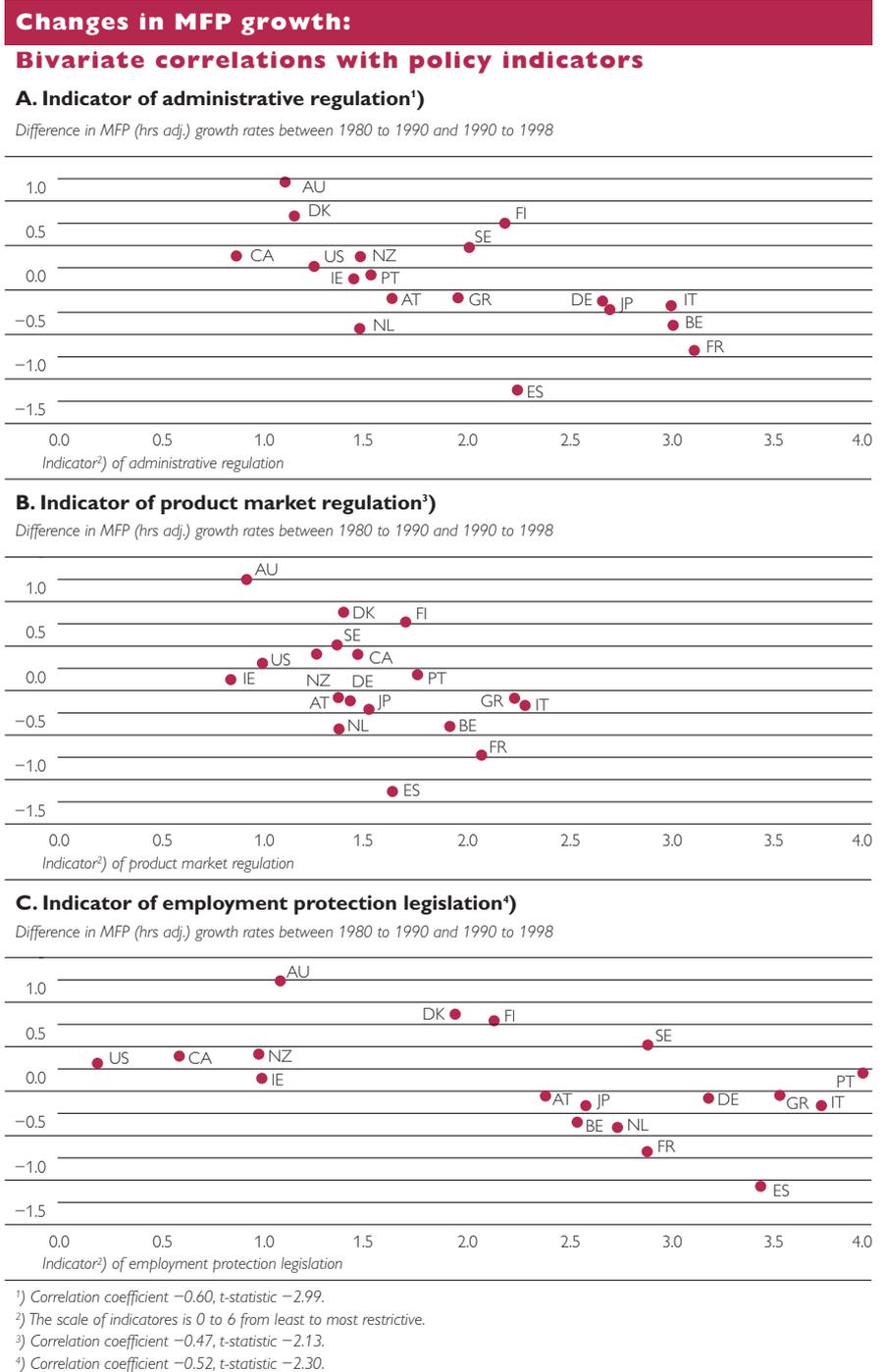
prises, having no history, no existing structure and no vested interests, may sometimes be better at harnessing the new technology, including by achieving the most efficient form of organisation. The most important role for policy in this context is to provide a framework that enables entrepreneurship to flourish. Conditions in this area vary markedly across OECD countries, including within Europe.

There are many aspects to providing an enabling framework for entrepreneurship. One is to ensure a competitive environment by facilitating new entry in markets which are inherently competitive. The regulatory reforms that have swept telecommunications and a range of sectors across the OECD provide graphic examples of the benefits from such an approach. Public administration is important so as to avoid excessive administrative burdens and red tape affecting enterprises. Indeed, and for what it is worth, there are some signs of correlation between trends in broad MFP growth across countries and indicators of the regulatory burden in the administrative and market competition fields (figure 11, panels A and B).²⁾ Likewise, excessive or strongly distortive taxation is also detrimental to entrepreneurship. And basic legal aspects of the enterprise environment such as company and bankruptcy laws need to strike the right balance between encouraging entrepreneurial behaviour and the interests of those saving and lending the money to finance new investment. Finally, a particular issue concerning ICT is that barriers to network access are likely to have detrimental effects and may often be the result

1 See OECD, *Implementing the OECD Jobs Strategy – Assessing Performance and Policy*, Paris, 1999.

2 These indicators have been elaborated as part of the OECD project on regulatory reform. For an introduction see OECD (1999a) and for a detailed description Nicoletti et al. (1999).

Figure 11

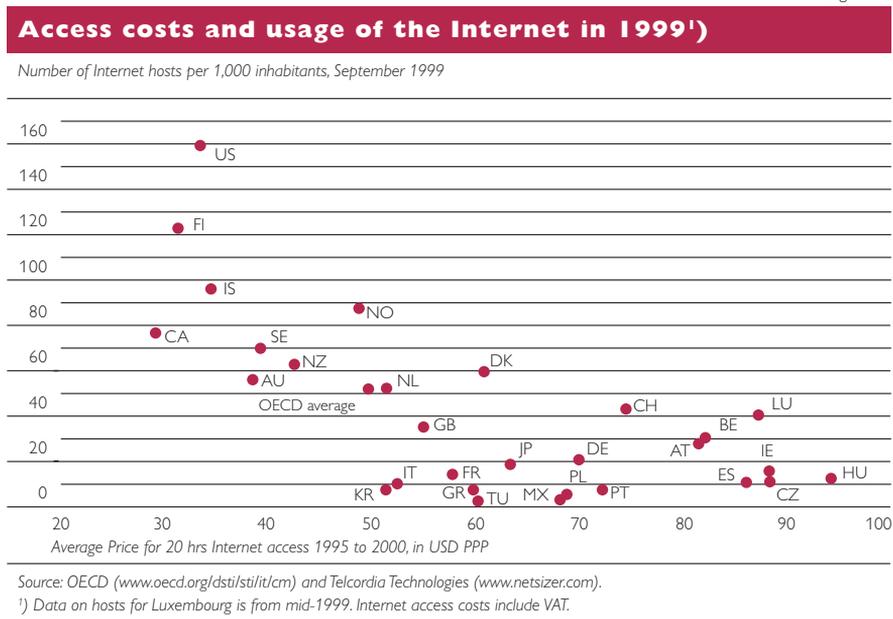


of inappropriate government intervention, the effects of which seem to linger on even after liberalisation such as in the case of Internet access costs (figure 12).

Financial systems have important roles to play. They mobilise and pool

individual saving to finance investment. They allocate finance to the activities generating the highest return. They diversify and reallocate risk among individual investors. And, in the context of wider corporate governance arrangements they

Figure 12



act to monitor and discipline managers of existing enterprises. A particular focus in the context of the New Economy has been the financing of new, innovative enterprises. Equity is a better source of finance than traditional debt in many of these cases, given the often limited cash flow, the absence of collateral, and the high risk (the upside of which does not benefit lenders). The success of venture capital in nurturing the growth of the US ICT industry have led to efforts in many European countries to stimulate venture finance. Whether public support can be effective in this field is not quite clear. Moreover, policies can provide the right framework conditions for venture capital, such as ensuring easy exit possibilities through stock market listing.

An efficient labour market is also important so as to achieve a swift reallocation of labour between enterprises. Reaping the efficiency gains of ICT may require the shedding of

labour. Exits of low-productive enterprises and plants sets labour free to be redeployed in more effective uses.¹⁾ Across countries, and again meant mainly as an illustration, trends in broad MFP growth seem to be negatively correlated with the strictness of job protection (figure 11, panel C).

7 Concluding remarks

This paper provides evidence that faster growth of output and labour productivity in the United States over the 1990s was associated with significant technological change, as estimated by faster growth rates of MFP – especially in the most recent years. Evidence is accumulating that most of the productivity acceleration results from the spread of ICT. Steeply rising productivity in the ICT-producing industry itself made a significant contribution to the speed-up of labour and multi-factor productivity at the macro level in the 1990s. Moreover, ICT capital

¹ In a recent study based on enterprise data for the UK manufacturing industry, Disney et al. (2000) finds that a very large part of overall MFP growth originates from enterprises closing low-productive units.

deepening in other industries made a contribution to aggregate output and productivity growth, rising in the most recent years. In addition, some scattered evidence suggests a rapid growth in “network” aspects of ICT in the United States via the penetration of Internet and e-commerce, although its impact on MFP growth is yet to be unequivocally demonstrated, and is complicated by measurement problems. Some of these trends are likely to continue and could signal a move towards relatively higher potential growth rates for some time to come.

There is also evidence of a speed-up in ICT investment and a growing role of the ICT-producing industry in other OECD countries, though generally starting from a lower level than in the United States. Likewise, ICT-related networks have spread in most countries, rendering possible substantial changes in the way businesses operate and potentially creating new opportunities for growth.

But ICT is only part of the story behind diverging growth trends between Europe and the United States. Weak employment, especially among traditional outsider groups, also contributed. And in terms of levels of GDP per capita, low utilisation of labour is the main component of the large, and now widening, gap between the European Union and the United States. Even if closing the employment gap should come at the price of some decline in average productivity, as low-skilled get a foothold in the labour market, it represents an enormous growth potential for Europe.

In these conditions, it may be appropriate to focus the policy effort in Europe on raising employment levels. The policy requirements in this field are reasonably well understood and, indeed, a number of

countries are taking steps in the right direction. Moreover, more flexible labour markets are, if anything, likely to help reaping the gains from ICT.

The appropriate policy settings to reap the full benefits from ICT are generally less well understood. However, they likely include framework conditions that allow a flexible reallocation of resources within economies. This will help the processes of identifying new business opportunities, starting new enterprises and changing the organisation of existing ones. 

References

- Bartelsman, E. J., Doms, M. (2000).** Understanding Productivity: Lessons from Longitudinal Microdata. In: *Journal of Economic Literature*, forthcoming.
- Bassanini, A., Scarpetta, S., Visco, I. (2000).** Knowledge, Technology and Growth: Recent Evidence from OECD Countries. In: National Bank of Belgium, Working Papers Series, May, forthcoming.
- Blöndal, S., Scarpetta, S. (1998).** The retirement decision in OECD countries. In: OECD Economic Department Working Papers, No. 202.
- Bureau of Labor Statistics (1993).** Labor Composition and U.S. Productivity Growth, 1948–90. In: U.S. Department of Labor, Bureau of Labor Statistics, Bulletin 2426. December.
- Council of Economic Advisers (2000).** Economic Report of the President – 2000, February.
- Disney, R., Haskel, J., Heden, Y. (2000).** Restructuring and productivity growth in UK manufacturing, mimeo.
- Elmeskov, J., Martin, J. P., Scarpetta, S. (1998).** Key lessons for labour market reforms: evidence from OECD countries' experiences. In: *Swedish Economic Policy Review*, Vol. 5/2.
- Gordon, R. J. (1999).** Has the “New Economy” Rendered the Productivity Slowdown Obsolete? Northwestern University, mimeo.

- Gordon, R. J. (2000).** Does the “New Economy” measure up to the great inventions of the past? In: *Journal of Economic Perspectives* (forthcoming).
- Grubb, D. (2000).** Eligibility criteria for unemployment benefits. In: *OECD Economic Studies*, 31.
- Hodrick, R. J., Prescott, E. C. (1997).** Post-War U.S. Business Cycles: An Empirical Investigation. In: *Journal of Money, Credit and Banking*, Vol. 29, No. 1.
- Jorgenson, D. W., Stiroh, K. J. (2000).** Raising the Speed Limit: U.S. Economic Growth in the Information Age. May, mimeo.
- Nicoletti, G., Scarpetta, S., Boylaud, O. (1999).** Summary indicators of product market regulation with an extension to employment protection legislation. In: *OECD Economics Department Working Papers*, No. 226.
- OECD (1998).** *Employment Outlook*, Paris.
- OECD (1999 a).** *Economic Outlook 66*, Paris.
- OECD (1999 b).** *The OECD Jobs Strategy: Assessing Performance and Policy*, Paris.
- OECD (1999 c).** *OECD Economic Surveys – Ireland*, Paris.
- OECD (2000 a).** *Economic Outlook 67*, forthcoming, Paris.
- OECD (2000 b).** *OECD Economic Surveys – United States*, Paris.
- Oliner, S. D., Sichel, D. E. (2000).** The Resurgence of Growth in the late 1990s: Are Computers the Story? In: *Journal of Economic Perspectives*, forthcoming.
- Scarpetta, S., Bassanini, A., Pilat, D., Schreyer, P. (2000).** Economic Growth in the OECD Area: Recent Trends at the Aggregate and Sectoral Level. In: *OECD Economics Department Working Paper*, forthcoming.
- Schreyer, P. (2000).** The Contribution of Information and Communication Technology to Output Growth: A Study of the G-7 Countries. In: *OECD STI Working Paper 2000/2*.
- Solow, R. M. (1957).** Technical Change and the Aggregate Production Function. In: *Review of Economics and Statistics*, Vol. 39, pp. 312–320.
- Whelan, K. (2000).** Computers, Obsolescence and Productivity. February, mimeo.

Annex

Table A1

Growth performance in OECD countries

	Actual growth of GDP				Actual growth of GDP per capita				Trend growth of GDP per capita		Trend growth of GDP per person employed	
	1970 to 1980	1980 to 1990	1990 ¹⁾ to 1998	1999	1970 to 1980	1980 to 1990	1990 ¹⁾ to 1998	1999	1980 to 1990	1990 to 1998	1980 to 1990	1990 to 1998
	Average annual rate of change in %											
US	+3.2	+3.2	+3.0	+ 4.2	+2.1	+2.3	+2.0	+3.2	+2.0	+2.2	+1.1	+1.7
JP	+4.4	+4.0	+1.4	+ 0.3	+3.3	+3.4	+1.1	+0.1	+3.3	+1.6	+2.6	+1.3
DK	+2.7	+2.2	+1.4	+ 1.5	+2.6	+2.0	+1.0	+1.4	+1.9	+0.9	+1.6	+1.9
FR	+3.3	+2.4	+1.4	+ 2.9	+2.7	+1.8	+0.9	+2.5	+1.6	+1.2	+1.9	+1.4
IT	+3.6	+2.2	+1.3	+ 1.4	+3.1	+2.2	+1.2	+1.3	+2.3	+1.3	+2.2	+1.9
GB	+1.9	+2.7	+2.0	+ 2.1	+1.8	+2.5	+1.7	+1.7	+2.2	+1.8	+1.9	+1.8
CA	+4.3	+2.8	+2.2	+ 4.2	+2.8	+1.6	+1.1	+3.4	+1.5	+1.2	+1.0	+1.1
AU	+3.3	+3.3	+3.5	+ 4.4	+1.9	+1.7	+2.3	+3.1	+1.6	+2.4	+1.2	+2.0
AT	+3.7	+2.3	+1.9	+ 2.2	+3.5	+2.1	+1.3	+2.1	+2.1	+1.7	+2.0	+1.8
BE	+3.4	+2.0	+1.8	+ 2.5	+3.2	+1.9	+1.5	+2.3	+1.9	+1.7	+1.8	+1.7
CZ	..	..	+0.4	- 0.2	..	..	+0.4	-0.1	..	..	..	..
DK	+2.2	+1.9	+2.3	+ 1.6	+1.8	+1.9	+1.9	+1.2	+2.0	+2.1	+1.5	+2.4
FI	+3.4	+3.1	+1.5	+ 3.5	+3.1	+2.6	+1.0	+3.2	+2.2	+1.3	+2.4	+2.9
GR	+4.7	+1.6	+2.0	+ 3.2	+3.7	+1.1	+1.4	+2.9	+1.3	+1.3	+0.9	+1.0
HU	..	..	-0.2	+ 4.5	..	..	+0.1	+4.9	..	..	..	..
IS	+6.3	+2.7	+2.2	+ 4.4	+5.2	+1.6	+1.3	+3.3	+1.7	+0.8	+1.3	+1.2
IE	+4.7	+3.6	+6.3	+ 8.7	+3.3	+3.3	+5.5	+7.4	+3.0	+5.6	+3.5	+3.2
KR	+7.6	+8.9	+5.2	+10.7	+5.8	+7.6	+4.1	+9.7	+7.2	+5.3	+5.6	+4.0
LU	+2.6	+4.5	+5.3	+ 4.9	+1.9	+3.9	+3.9	+3.6	+4.0	+4.0	+2.8	+2.4
MX	+6.6	+1.8	+3.0	+ 3.7	+3.4	+0.0	+1.3	+1.4	+0.3	+1.2	..	-0.2
NL	+2.9	+2.2	+2.6	+ 3.6	+2.1	+1.6	+2.0	+3.0	+1.6	+2.1	+1.1	+0.8
NZ	+1.6	+2.4	+2.2	+ 3.9	+0.5	+1.7	+0.7	+3.4	+1.2	+0.8	+1.6	+0.4
NO ²⁾	+4.2	+1.5	+3.1	+ 0.8	+3.6	+1.1	+2.6	+0.2	+1.4	+2.2	+2.1	+2.5
PL	..	..	+3.5	+ 4.0	..	..	+3.4	+4.0	..	..	..	..
PT	+4.7	+2.9	+2.4	+ 3.0	+3.4	+2.9	+2.3	+2.7	+2.9	+2.5	+1.6	+1.7
ES	+3.5	+3.0	+2.1	+ 3.7	+2.4	+2.6	+1.9	+3.6	+2.3	+2.2	+2.4	+1.7
SE	+1.9	+2.1	+1.1	+ 3.8	+1.6	+1.8	+0.6	+3.7	+1.5	+0.9	+1.6	+2.4
CH	+1.9	+2.1	+0.5	+ 1.7	+1.7	+1.5	-0.3	+1.5	+1.6	+0.1	+0.4	+0.4
TU	+4.1	+5.2	+4.2	- 5.0	+1.8	+2.8	+2.4	-6.6	+2.0	+2.3	+2.8	+2.6
EU	+3.0	+2.4	+1.7	+ 2.3	+2.6	+2.1	+1.3	+2.1	+2.0	+1.5	+2.3	+1.8
OECD ³⁾	+3.4	+3.0	+2.3	+ 2.7	+2.5	+2.3	+1.6	+2.1	+2.1	+1.8	+2.8	+2.4

Coefficients of variation of trend series⁴⁾

	GDP		GDP per capita		GDP per person employed		GDP per hours worked	
	1980 to 1990	1990 to 1998	1980 to 1990	1990 to 1998	1980 to 1990	1990 to 1998	1980 to 1990	1990 to 1998
	Coefficient							
OECD ³⁾	0.47	0.54	0.56	0.66				
EU	0.28	0.58	0.31	0.61	0.33	0.33	0.28	0.32
OECD 24 ⁵⁾	0.28	0.51	0.32	0.61	0.40	0.41	0.35	0.40

Source: OECD.

¹⁾ 1991 for Czech Republic and Germany.

²⁾ Mainland only.

³⁾ Excluding Czech Republic, Hungary and Poland.

⁴⁾ Calculated as the ratio of the standardised deviation to the mean of trend growth rates across countries.

⁵⁾ Excluding Czech Republic, Hungary, Korea, Mexico and Poland.

Table A2

Estimates of multi-factor productivity growth rates, smaller countries¹⁾

(based on trend series time-varying factor shares)

		1980 ²⁾ to 1990	1990 to 1998 ³⁾
		Average annual growth rate in %	
AU	MFP growth	+0.9	+2.1
	with control for human capital	+0.9	+2.0
BE	MFP growth	+1.4	+1.0
	with control for human capital	..	..
DK	MFP growth	+1.0	+1.8
	with control for human capital	+0.9	+1.9
FI	MFP growth	+2.4	+3.2
	with control for human capital	+2.2	+2.8
GR	MFP growth	+0.6	+0.3
	with control for human capital	..	..
IE	MFP growth	+3.9	+3.9
	with control for human capital	+3.8	+3.6
NL	MFP growth	+2.2	+1.7
	with control for human capital	+2.2	+1.7
NZ	MFP growth	+0.7	+1.1
	with control for human capital	+0.6	+1.2
NO ⁴⁾	MFP growth	+1.1	+2.1
	with control for human capital	+0.9	+1.9
PT	MFP growth	+1.9	+2.2
	with control for human capital	+1.9	..
ES	MFP growth	+2.2	+0.6
	with control for human capital	..	..
SE	MFP growth	+0.8	+1.3
	with control for human capital	+0.6	+1.0
CH	MFP growth	..	+0.2
	with control for human capital	..	+0.2

Source: OECD.

¹⁾ For each country, the first line shows estimated MFP growth rate without control for composition/quality changes in labour and capital; the second does control for changes in the composition of labour.

²⁾ 1984 for Denmark, 1986 for New Zealand and Portugal.

³⁾ 1997 for Australia, Belgium, Norway and Spain, 1996 for Finland, Greece, Ireland, New Zealand and Sweden, 1995 for Switzerland, 1992 for Portugal.

⁴⁾ Mainland only.

TIMO J. HÄMÄLÄINEN



TIMO J. HÄMÄLÄINEN
DEVELOPMENT MANAGER OF THE FINNISH NATIONAL FUND
FOR RESEARCH AND DEVELOPMENT, SITRA

Catching up
and forging ahead:
explaining
the postwar growth experience
in Finland

I Introduction¹⁾

The world economy is currently going through a major techno-economic paradigm shift. The rapid development and diffusion of new information technologies and organizational arrangements has challenged the old economic and social structures of industrialized countries. The rapid structural change, in turn, is calling into question long-established social theories and ideologies which were developed

1 The general parts of this paper are based on the author's dissertation which he defended in Rutgers University, New Jersey, last year. It will be published with the title "National Competitiveness and Economic Growth: The Changing determinants of Economic Performance in the World Economy" by Edward Elgar next winter.

in very different circumstances. Indeed, borrowing from Thomas Kuhn, there are clear signs of a paradigm crisis in many social sciences including economics, sociology and management science (see e.g. Heilbroner and Milberg, 1997; Beck, 1998). According to Kuhn, debates among different schools of thought, such as the one about the “New Economy”, are typical for periods of paradigm crisis (Kuhn, 1975). Indeed, the title of this conference, “The New Millennium –



Time for a New Economic paradigm?”, also reflects the increased uncertainty in social sciences and economic policy making.

The paradigm shift also calls into question the established growth theories. In particular, the systemic change that touches all parts of the society challenges simple theories which focus on few determinants of growth and competitiveness and neglect many other important factors. The neoclassical growth theories have tended to assume that the market mechanism organizes economies efficiently. This has led to an emphasis on the accumulation of different types of productive resources: natural, physical and human. This input-driven approach tends to gloss over the technological, organizational, political and institutional factors which determine the efficiency with which those inputs are used in the economy. This is problematic in the highly specialized, complex and knowledge-intensive modern economies where market imperfections are pervasive and productivity growth is a key determinant of economic growth (Stiglitz, 1989). No wonder the empirical studies of neoclassical scholars have left a large unexplained residual

(total or multifactor productivity growth) which Moses Abramovitz has called as a “measure of their ignorance” (1993).

The endogenous growth theories acknowledge the existence of market failures in modern economies and focus on the increasing returns related to education, R&D, learning-by-doing and knowledge spillovers. However, these models are quite difficult to test empirically. The operationalization of some key independent variables is hard and the assumption of increasing returns makes the use of standard regression analysis problematic. Moreover, from the perspective of institutional economics, the endogenous theories use a rather simple approach to economic organization – i.e. the traditional market-vs-government dichotomy. Clearly, modern economies include many other organizational arrangements (networks, associations, corporate hierarchies) which can be efficient in different situations.

Both neoclassical and endogenous growth scholars pay very little attention to the socio-cultural and institutional variables identified by their classical predecessors. Perhaps, these variables have been too difficult to model rigorously in mathematics. Moreover, neither of these two approaches pays sufficient attention to the characteristics of product markets and international business activities as determinants of growth. These factors have become increasingly important for growth as the innovation competition and globalization have become more intensive.

The OECD paper has a strong empirical basis and seems to belong to the neoclassical tradition. In this tradition, it provides a very good and comprehensive discussion about the growth impacts of modern ICT in OECD economies. However, like

other neoclassical models it tends to suffer from the scarcity of explanatory variables. This is problematic since the paradigm shift in the world economy involves a *systemic change* in many determinants of economic performance.

The systemic nature of the change creates other challenges, too. The adoption and use of new ICTs tends to have a high correlation with changes in other parts of the economic system: particularly in

- a) productive resources (increasing importance of created and advanced resources),
- b) organizational arrangements (from hierarchical to cooperative arrangements), and
- c) product market characteristics (increasing competition and differentiation and sophistication of demand) (see Hämmäläinen, 2000). In such a highly correlated system, it is hard to tell which independent factor(s) should deserve the credit for the growth impacts of the “New Economy”. Indeed, if tested separately, one could probably reach similar conclusions with any of the above growth factors.¹⁾

In the current paradigm shift, economic growth should be studied from a holistic perspective which can capture all key variables and their interdependencies. Otherwise growth researchers will resemble the famous blind men who were touching different parts of the same elephant without understanding the true nature of the beast. In the search for more holistic explanations, theories of long socio-economic waves can be particularly useful.²⁾

In the Marxian tradition, these theories emphasize the importance of systemic socio-institutional adjustment to the new technological and organizational innovations (e.g. Freeman and Perez, 1988; Boyer and Hollingsworth, 1997). In the following section, we will use our own version of the long wave theories to discuss the changing determinants of growth during a techno-economic paradigm shift.

2 A theory of catching up and forging ahead

The neoclassical growth theory suggests that, over time, poor countries will catch up to the wealthier ones because they can learn from the leading countries’ production methods and technologies. However, recent empirical evidence has supported this “catching up effect” only among the relatively wealthy countries, really poor developing countries have been falling further behind (Barro and Sala-I-Martin, 1995). Moreover, in recent years, even the differences among industrialized countries have tended to increase. In particular, the leading country of the new paradigm, the United States, seems to be leaving others behind. This suggests that the catching up phenomenon may be related to a particular phase in long socio-economic cycles. Indeed, after the First Industrial Revolution in the early 19th century, it was the United Kingdom that was forging ahead all the other developed countries (Freeman, 1995). Hence, there seems to be a need for a more sophisticated theory of

1 As an example, our own study of the OECD countries in the 1980s and early 1990s found product market conditions to be a far more important determinant of growth than technological competitiveness (which included the adoption of modern ICT). However, reflecting the systemic nature of change, there was a high correlation between product market conditions and technological competitiveness (Hämäläinen, 2000).

2 Long wave theorizing first emerged in the 1920s and 30s as the Second Industrial Revolution was challenging the structures and institutions inherited from the 19th century.

catching up and forging ahead for techno-economic paradigm shifts.

Historically, the catching up phenomenon has been related to the mature stages of a techno-economic paradigm (late 19th century and the post-Second World War period). At this stage, both the advance of the techno-economic frontier begins to slow down and the imitation of best practice becomes easier. The economic growth of the leading countries is slowed down by the fact that radical



innovations become increasingly difficult to make along the established technological trajectories and that these countries are the first to experience the growing problems of a mature paradigm (shortages of key resources, increasing organizational problems, changing patterns of demand, institutional rigidities, etc.). At the same time, the core production technologies and methods of the old paradigm become increasingly mature and standardized and, hence, easier to transfer across borders and to imitate. This is a period of decreasing returns in socio-economic development.

Once the techno-economic paradigm shift really begins, the catching up process is further facilitated by the fact that the leading economies have heavy investments in the structures of the old paradigm (established infrastructure, production equipment, personal skills, core technologies, organizational arrangements and market structures). These

“sunk costs” may slow down the diffusion of the new paradigm because individuals and organizations are unwilling to “cannibalize” their old assets by shifting to the new production paradigm. The resistance to change can also be increased by the leading societies’ long success with the old socio-economic paradigm which creates mental inertia and provides financial buffers against the accumulating problems of the old paradigm. As a result, these societies can easily become “locked into” the old paradigm (see also Freeman, 1995; Schienstock, 1999). Only strong incentives for change, such as highly competitive markets or an economic crisis, can break such mental rigidities for structural change.

Hence, a techno-economic paradigm shift gives the more flexible catching-up economies a “window of opportunity” to pass by and forge ahead the old leading economies (Abramovitz, 1986; Perez and Soete, 1988). The most advanced catching-up economies naturally have the best chance of becoming the leaders of the new paradigm. Societies further behind the techno-economic frontier will have greater difficulties in catching-up to the new paradigm.

During and after a major paradigm shift in the world economy, the competitiveness and growth of national economies depends upon their particular socio-economic *starting point* – their existing resources, technologies, organizational arrangements, product market structures, international business activities, institutions and government role – and their *adjustment capacity* vis-à-vis the emerging techno-economic and socio-institutional paradigms (Abramovitz, 1995; Lipsey, 1997).

A good starting point (close to the new “best practice” paradigm) and adjustment capacity give a soci-

ety a clear advantage in socio-economic development due to the “increasing returns” associated with the quick and balanced adjustment to the new paradigm. The increasing returns to adjustment stem from the systemic interdependencies and positive feedback loops within the new techno-economic paradigm. More specifically, they come from the (Arthur, 1994; Freeman, 1995; Lipsey, 1997):

- a) increasing specialization and scale of production within the new paradigm,
- b) rapid learning of producers and consumers (about the new products, production methods and organizational arrangements),
- c) growing external benefits in production (emergence, growth and clustering of complementary industries and activities) and consumption (network externalities), and
- d) the external economic benefits of socio-institutional adjustment.

The societies that are unable to adjust in the early stages of the new paradigm, or can only adjust in an unbalanced way, will not gain the increasing returns of the new paradigm and begin to fall behind the leading countries.

In the early stages of the new paradigm, the increasing returns associated with the rapidly advancing techno-economic frontier make catching-up very difficult to late-adjusting societies. The new resources, technologies and organizational innovations initially emerge in unstandardized form and, hence, are difficult to transfer, especially across borders. As a consequence, the new leaders of the world economy tend to forge ahead the other advanced economies after major technological revolutions. For example, the United States increased its economic lead to the other industri-

alized countries in the early part of the 20th century, just as Great Britain had done in the early 19th century (Freeman, 1995). As we have noted above, the same phenomenon seems to take place also in the current paradigm shift.

In the following section, we will use the growth experience of Finland to illustrate our theory in the present context of the world economy.

3 Postwar growth experience in Finland: catching up and forging ahead

The postwar growth experience of Finland resembles the contemporary growth miracles of Japan and West Germany. After the lost war and heavy war reparations the Finnish economy industrialized very rapidly on the back of heavy investments in export-oriented heavy industries such as paper and pulp, basic metals and chemicals. There was a national consensus on the investment-driven growth strategy which rapidly brought Finland closer to the world technological frontier and created new domestic technological capabilities (Pohjola, 1996). The acquisition of foreign machinery and equipment played a key role in the technological catching up process. Equally important was the determination with which the national education system was developed. The growth strategy was also supported by tightly regulated capital markets (low interest rates), generous tax exemptions for investments, flexible exchange rate policies and the highly profitable barter trade with the Soviet Union. The Finnish welfare state was modelled according to the successful Swedish example.

In the end of the 1980s, Finland had reached the league of the wealthiest countries in the world as measured by the GDP per capita. Her

catching up process was perhaps even more impressive than those of West Germany and Japan because Finland was *not* an industrialized economy before the war like these two other countries. However, at the same time, the structural inefficiencies and distortions created by the investment-driven growth strategy also began to emerge. The deregulation of financial markets (increasing real interest rates) and the collapse of the Soviet Union revealed the structural inefficiency of the Finnish economy. The fact that Finland was the most expensive OECD country both in 1989 and 1990 in PPP comparisons reflected this inefficiency.

In Fall 1990, the Finnish economy collapsed to the most severe depression in independent Finland's history. Numerous firms filed for bankruptcy, thousands of over-borrowed households defaulted on their debts and the banking system went into deep crisis. The unemployment rate reached a top at 20% and the state ran a massive budget deficit. Very soon, the state finances were at the mercy of international lenders. It became clear to all Finns that the old ways of doing things did not work anymore; the society was up for major structural changes.

In the early 1990s, Finnish firms laid off their workers *en masse*, re-organized their business processes, and considerably improved their productivity and competitiveness. And, all this nearly without new investments. The government made drastic cuts in public expenditures which had been impossible in better economic times. At the same time, the export competitiveness of Finnish firms was re-emphasized as a key policy goal. Also, individual citizens changed their behavioral patterns: people began to pay back their debts, work harder and many sought new training opportunities to upgrade

their skills. Hence, the economic crisis came with a silver lining: it reduced the society's mental rigidities to adjustment. Moreover, being a late-industrializing country, Finland had not become so deeply embedded in the old techno-economic paradigm as many older industrialized countries. Thus, the Finnish society has been relatively flexible in its adjustment to the new techno-economic environment.

A consensus on the new growth strategy began to emerge somewhere in the mid 1990s once the immediate problems of the economic crisis began to subside. Instead of inputs and investments, the new strategy emphasized economic efficiency and innovation. With the severe economic crisis in the background, such strategy was easy to understand. The Finnish economy was increasingly exposed to foreign competition and could not compete without world class efficiency, productivity and value-adding capacity. Having strong engineering orientation, the value-adding strategy was based on technological innovation. Policy makers wanted Finland to become a true knowledge-based society and the initial success of the telecommunications cluster provided support for this strategy. As a result, the role of technology policy became central in the new growth strategy. Perhaps reflecting a historical path-dependency, the goal of increasing national R&D inputs became central to technology policy in the late 1990s.

During the 1990s, Finland was very successful in its adjustment to the emerging techno-economic paradigm. In our study of 22 OECD countries, Finland jumped from the 14th position to the 5th place in terms of overall structural competitiveness (Hämäläinen, 2000). In the same study, we also found a strong link between the structural determinants

of competitiveness and economic performance (see also Porter, 1998). We used a holistic framework which included seven key determinants of competitiveness:

1. new productive resources (venture capital, human capital, scientific knowledge, ICT-infrastructure),
2. new technologies (R&D inputs, innovations, adoption of ICTs),
3. new organizational arrangements (allocative, technical, coordination and dynamic efficiencies),
4. new product market characteristics (sophistication of demand, product market institutions, user-producer cooperation),
5. degree of internationalization (extent of FDI, international trade, cross-border alliances),
6. institutional incentives (taxation, regulation, returns to education), and
7. the role of government (expenditure on efficiency vs. equity related tasks).

The competitiveness reports of the Swiss IMD and WEF suggest that the competitiveness of Finland continued to increase during the latter part of the 1990s. The increasing returns of systemic adjustment were also reflected in the high multifactor productivity growth rate in Finland during the 1990s. As we saw in the OECD paper, this rate, as adjusted for changes in the quality of human capital, jumped in Finland from 2.2% in the 1980s to 2.8% between 1990 and 1996, whereas the corresponding figures for the U.S. were 0.8 and 0.9%, for Germany 1.6 and 2.0%, and for France 1.9 and 0.5%. The rapid adjustment, increasing competitiveness and high MFP growth of the Finnish socio-economic system supported strong economic growth in the late 1990s.

4 Tentative conclusions

The recent success of the Finnish economy in general, and its telecommunications cluster in particular, has attracted a lot of foreign attention. Numerous delegations of foreign policy makers and researchers are visiting Finnish firms and authorities in order to find out the drivers of Finnish success. However, there seems to be many different success factors and no one can provide a comprehensive explanation. From the perspective of long socio-economic waves, it looks as if a small and culturally homogenous country like Finland could have a *competitive advantage in the systemic adjustment required by the new techno-economic paradigm*. The increasing returns of the new paradigm can more easily be reached when the key decision makers in different fields can easily be gathered around one table and their previous social relationships and mutual trust facilitates the coordination of complementary activities (see also Lundvall, 1999). Such systemic adjustment is likely to be more difficult in larger and culturally more diverse societies.

Despite this competitive advantage, the process of systemic adjustment in Finland is not unproblematic. Particularly, the social security system, labor market institutions and the role of government in the society still require reforms. There are strong vested interests and mental rigidities in these areas. However, as the challenges of the new paradigm become increasingly evident over time, the Finnish system of “negotiated order” is likely to find workable solutions for the remaining (and upcoming) adjustment problems.



References

- Abramovitz, M. (1993).** The search for the Sources of Growth: Areas of Ignorance, Old and New. In: *The Journal of Economic History*, Vol. 53, June, No. 2, 217–243.
- Abramovitz, M. (1995).** The Origins of the Postwar Catch-Up and Convergence Boom. In: Fagerberg, J., Verspagen, B., von Tunzelmann, N. (eds.). *The Dynamics of Technology, Trade and Growth*. Edward Elgar, Brookfield.
- Arthur, B. W. (1994).** Increasing Returns and Path Dependence in the Economy. In: University of Michigan Press, Ann Arbor.
- Barro, R., Sala-i-Martin, X. (1995).** *Economic Growth*. McGraw-Hill, New York.
- Beck, U. (1998).** Democracy without Enemies. In: Polity Press, Cambridge.
- Boyer, R., Hollingsworth, J. R. (eds.) (1997).** Contemporary Capitalism: The Embeddedness of Institutions. In: Cambridge University Press, New York.
- Freeman, C. (1995).** History, Co-Evolution and Economic Growth. In: IIASA WP-95-76, September.
- Freeman, C., Perez, C. (1988).** Structural Crises and Adjustment, Business Cycles and Investment Behaviour. In: Dosi, G., Freeman, C., Nelson, R., Silverberg, G., Soete, L. (eds.). *Technical Change and Economic Theory*. In: Pinter Publishers, London.
- Heilbroner, R., Milberg, W. (1997).** The Crisis of Vision in Modern Economic Thought. In: Cambridge University Press, New York.
- Hämäläinen, T. (2000).** National Competitiveness and Economic Growth: The Changing Determinants of Economic Performance in the World Economy, (forthcoming). Edward Elgar.
- Kuhn, T. S. (1975).** The Structure of Scientific Revolutions. In: University of Chicago Press, Chicago.
- Lipsey, R. G. (1997).** Globalization and National Government Policies: An Economist's View. In: Dunning J. H. (ed.). *Governments, Globalization, and International Business*. In: Oxford University Press, London.
- Lundvall, B.-Å. (1999).** Technology Policy in the Learning Economy. In: Arhibugi, D., Howells, J., Mitchie, J. (eds.). *Innovation Policy in a Global Economy*. In: Cambridge University Press, Cambridge.
- Pohjda, M. (1996).** Tehoton pääoma. WSOY, Helsinki.
- Porter, M. (1998).** Measuring Micro-economic Foundations of Economic Development. In: *Global Competitiveness Report*. World Economic Forum, Geneva.
- Schienstock, G. (1999).** Transformation and Learning: A New Perspective on National Innovation Systems. In: Schienstock, G., Kuusi, O. (eds.). *The Challenge for the Finnish Innovation System: Transformation Towards a Learning Economy*, Sitra 213, Helsinki.
- Stiglitz, J. E. (1989).** On the Economic Role of State. In: Stiglitz, J. E. (ed.). *The Economic Role of State*. Basil Blackwell, Oxford.



JØRGEN BIRK MORTENSEN



Comments on Jørgen Elmeskov
and Stefano Scarpetta:
New sources
of economic growth
in Europe?

Introduction

I can congratulate the authors on having presented a well-written and a well-argued paper on interesting issues. This is a very stimulating paper, which successfully combines theoretical ideas, empirical data and policy discussion. The discussion of data problems and the quality change problems related to the ICT sector is interesting.

I will organise my comments around some ideas from a chapter in a report from The Danish Economic Council 1998, which discuss “New Economics” and add some comment on the growth and labour market in Denmark related to policies to raise employment as one

action to enhance growth in Europe (discussed by Jørgen Elmeskov and Stefano Scarpetta). Low rather than high productivity growth may be part of this solution, which correspond to the Danish experience of raising employment but also relatively low productivity growth.

I New Economics

The concept of “New Economics” has emerged during the last few years. Advances in computer technology, increased globalization and other developments are supposed to have changed substantially the ways in which the economies of the industrialised countries function. In particular, “New Economics” implies a future characterised by high and stable economic growth, low unemployment, and low and stable inflation. Based on empirical analysis in the Danish Economic Council, the first part of this comment seeks to discuss and determine whether or not changes have indeed occurred in important economic relationships.

“New Economics” originates in the United States, where GDP has been expanding for more than nine years, but it has also gained popularity in countries such as Denmark and the United Kingdom, where recent economic developments have been similarly positive. However, other countries in, for example, Central Europe have experienced relatively slow growth and rising unemployment during the 1990s. In addition to Denmark, the United States and the United Kingdom, the analyses in The Danish Economic Council therefore include Germany as a representative of countries which are in a different phase of the business cycle.

Seven important phenomena characterise all of the four countries at the end of the 20th century, though to varying degrees.

- First, the service sector now dominates these economies.
- Second, there have been rapid advances in computer and information technology.
- Third, globalization means that countries are becoming ever more integrated through trade and capital flows.
- Fourth, liberalised financial markets have created new financial instruments and improved risk control.
- Fifth, many goods markets have been liberalised, e.g. transport and telecommunications.
- Sixth, labour market policies are increasingly aimed at ensuring flexible job rotation and wage formation.
- Seventh, the achievement of low inflation and small budget deficits has received a higher priority in macroeconomic policy.

Every one of these seven changes can potentially contribute to higher economic growth, lower inflation and unemployment, and reductions in the volatility of the business cycle. The aim of our discussion was to determine whether these potential effects have actually materialised.

Growth in the 1990s has been in line with the average growth rate for the post-war period in Denmark, West Germany, and the United States. The United Kingdom has in contrast experienced historically high growth rates, though this is more than anything a reflection of poor growth performance before the 1990s.

Even though growth in the 1990s has not been extraordinarily high in a historical perspective, tighter economic policies could have disguised the positive effects of “New Economics”. The new phenomena of the 1990s could therefore emerge as being a series of relatively large supply-side shocks on the economies

of these countries moderated by a series of negative demand shocks. But a structural VAR-analysis based on real growth and inflation – of the Blanchard and Quah type – reveals no such large supply-side shocks in the 1990s in the four countries. (Blanchard, O. J. and D. Quah, 1989: *The Dynamic Effects of Aggregate Demand and Supply Disturbances*. *American Economic Review* 79, 655–673.)

If international phenomena like globalization, the digital revolution, liberalisation of goods and capital markets etc. are important developments for the structure of economies in the 1990s, one would expect the economies to have become more open and thus more susceptible to external shocks. External shocks would to a greater extent be the same for all the economies. Accordingly, the level of correlation between shocks to the different economies should have increased. This has indeed been the case with respect to demand shocks for Denmark, the United Kingdom and the United States, but not for West Germany. This increased correlation is probably predominantly caused by the parallel upturn in growth in the former three countries. West Germany, on the other hand, started the decade with a reunion boom, followed by a slump from which it is just recovering. The correlation between supply-side shocks – the main channel for the changes in the 1990s – remains the same when data for the last decade are added.

The contrast between the strong expectations of high growth due to the seven phenomena listed above on the one hand, and actual growth rates that are moderate on the other, seems paradoxical. However, there appear to be natural explanations for the lack in growth. On the basis of neoclassical growth accounting, it

is estimated that computers are unlikely to have contributed more than ½ percentage point to annual US growth in recent years (up to 1997). This is primarily due to the fact that computers constitute a relatively small part of the total stock of productive equipment.

Globalization is another phenomena which is often expected to contribute substantially to economic growth and welfare. The existing evidence shows that global integration is beneficial for the countries involved, yet it is debatable whether the effects on annual growth in industrialised countries are actually very great. It is argued that the big gains from trade came in the 1950s and 1960s, when trade quotas and tariffs were reduced markedly, while the gains from more recent increases and changes in trade are more marginal. Similar arguments are presented for the other phenomena, which are also characterised by similar gradual growth.

One conclusion is therefore that the seven phenomena have contributed to economic growth in the four countries, but also that their effects have not been great enough to ensure historically high growth. Thus, the phenomena of the 1990s do not appear to be larger in relative terms than the phenomena that characterised earlier periods, e.g. the 1960s.

Inflation levels correlate closely for the four countries, and price increases have been low during the 1990s. Wage increases have been low as well, and it has been suggested that wage and price formation has changed fundamentally.

We have tested the wage formation by examining the wage equations included in a number of Danish



macroeconomic models and one international model. We have analysed how good the wage equations are at forecasting the wage increases. The conclusion is that there seems to be a structural break in the wage equation for the United States beginning in 1993. The other equations tend to forecast higher wage increases than were realised, but the differences between the expected and the actual changes are within the normal limits of statistical uncertainty. This indicates that the wage formation process has changed in the United States, while it seems to have remained stable in the other countries. Aggregate real wages in the United States have also been nearly constant since the 1970s, while they have increased in the other countries even when unemployment was high.¹⁾

Price formation might be affected by some of the major phenomena. Prices for computers and other IT products have fallen, international trade in goods has increased, and deregulation within, for example, the telecommunications sector has improved competition. Changes like these can reduce increases in consumer prices, but they are unlikely to have caused the large reductions in the level of inflation, since the effects of globalization, etc. affect prices gradually.

Inflation is also affected by changes in expected inflation. If a government announces a policy to reduce inflation, and the policy is considered credible by employers and workers, then it may be possible to reduce inflation without seriously harming growth. A number of

countries have followed a strategy aimed at achieving lower inflation, which is one of the qualifications countries have to fulfil in order to enter the EMU. One of the instruments has been to increase the central banks' independence of the government.

One way of determining expected inflation is to look at the interest rate level of long term government bonds, which partly reflects expectations of future price increases. A test of this hypothesis shows that it is possible to forecast inflation in this way in a number of countries, including the United Kingdom and Denmark, but not in the United States.

Our conclusion (in 1998) was that there have been a change in wage formation only in the United States, but the main reason for the low levels of wage and price increases in the 1990s in all countries has been a change in macroeconomic policy and price expectations.

"New Economics" could also be expected to change the business cycle. This is not because shocks to the economy have changed – they have not, as stated above – but because of a more flexible reaction of prices and quantities to shocks. Increased competition in goods and labour markets could have brought this about. One would then expect to see the impact effects of shocks on prices and quantities increase, and the rate of adjustment decrease, following a shock in an impulse-response analysis. However, the temporary effect on GDP of a demand shock is an exception, since it would be expected to decrease. Adjustment

1 The estimated wage increases have been calculated by dynamic simulation of the wage equations. The wage equation for Denmark is a former version of the wage equation of the macroeconomic model MONA of the Danish central bank. The wage equations used for the United States, the United Kingdom and Germany are nearly the same as those in Turner, D., Richardson, P., Rauffet, S. (1996): *Modelling the Supply Side of the seven major OECD Economies*, Working Paper No. 167, OECD Economics Department, Paris.

after supply shocks has indeed become faster in the 1990s in the United Kingdom and the United States, but the speed of adjustment to demand shocks has not increased. Neither Denmark nor West Germany has experienced any general increase in the rate of adjustment to shocks. All in all, the business cycle does not change consistently in the expected direction when data for the 1990s are included in the analysis.

Our analysis indicated that the economies of Denmark, the United States, the United Kingdom and Germany are working in almost the same way as they did in earlier decades. The optimistic view of the "New Economics" does not appear to be warranted. Consequently, there are no reasons to believe that the constraints on economic policy have decreased, and balanced and effective structural, fiscal and monetary policies are still required. Evidence from the most recent years showing an acceleration in trend GNP per capita could modify our conclusions. Our analyses did not examine new growth forces largely related to the ICED, which in my opinion is an interesting part of Jørgen Elmeskov and Stefano Scarpetta's paper.

2 Growth and labour markets in the Danish economy

Policies to raise employment is one action to enhance growth in Europe discussed by Jørgen Elmeskov and Stefano Scarpetta. Low rather than high productivity growth may be part of the solution to Europe's problem, because strong past growth of labour productivity has come as a result of not employing the least productive workers and of substitution towards capital forced by high labour costs. This correspond to the Danish

experience of raising employment but also relatively low productivity growth and discussion on future labour market reforms.

The Danish economy is entering the next millennium at a moderate pace. Domestic demand, which has driven growth for the last five years, is projected to show a fall for 1999. Only an improvement in exports has meant that GDP growth has not come to a halt; it is expected to be around 1% this year. Next year, domestic demand is expected to recover, so that growth will temporarily reach almost 2%. In 2001, growth will slow down again. Slow economic growth implies that private sector employment will decline. However, unemployment is only expected to increase slightly, thanks to continued increases in public sector employment. The low level of unemployment (the lowest in 20 years) is beneficial for the public budget, and a substantial surplus of around 2% of GDP is expected for 1999.

The slowdown in the Danish economy is primarily due to the tightening of economic policy, a tightening which has been instituted in order to prevent overheating. In addition the decline in interest rates, which encouraged consumption, has now been reversed; interest rates have risen over the last six months, helping to restrain demand. It is expected that house prices will start falling because of the fiscal tightening and the rise in interest rates. However, while private consumption is now considerably weaker, public consumption is still growing, although more slowly than in the past six years.

Prospects for Danish exports are somewhat better now after a bad year in 1998, when exports were negatively affected by a general strike. A pickup in growth abroad

means that exports will increase over the next couple of years. Weaker domestic demand will lead to a reduction in imports. Furthermore, imports are currently being dampened by the strong stock building which took place in 1998, making it possible to satisfy demand by drawing from stocks. The development in foreign trade will lead to a current account surplus of around 0.5% of GDP in 1999, compared to a deficit in the previous year amounting to 1.3%. This improvement is primarily due to a lower level of investments, since savings are largely unchanged. The current account will improve further in 2000 and 2001 because private savings can be expected to increase slightly. This reflects a falling propensity to consume, which will be mainly caused by lower house prices.

The growth in employment this year, together with a reduction in the size of the labour force, has caused unemployment to fall below 160,000 persons, corresponding to 5.5% of the labour force (national definition). Unemployment is expected to increase slightly in the forecast period. Because of this, wage pressure will abate somewhat, but wages will still grow at a higher rate than abroad – although the differential will be smaller. Inflation will show an increase for both 1999 and 2000, particularly because of increases in raw material prices. The low level of productivity in 1999 without a corresponding fall in wages also contributes to higher inflation. In addition, green taxes will add to inflation. In 2001, however, inflation is expected to fall.

The level of employment is higher than ever, and the number of unemployed has been reduced dramatically during the latest seven years with high growth. These facts must not overshadow that a large

number of persons have not benefited from the economic upturn. However, the positive economic outlook and the relatively small youth cohorts offer a unique possibility for reducing the entrance to the group of outsiders and to the group of persons expelled from the labour market.

The outsiders are defined as those, who are absent from the labour market for more than 80% of the time due to unemployment etc. over three years. The absence is due to unemployment, participation in active labour market programmes, leave from unemployment or rehabilitation. The outsiders are employed in less than 20% of the time and must be considered as being at the margin of the labour market. We estimate the number of outsiders to around 85,000 persons in 1998 which was equivalent to 2.5% of the population between 20 and 64 years. In 1994 the number of outsiders was approximately 145,000 (4.5%).

The expelled are those who have left the labour market against their will. A large share of these receive disability pension, labour market against their will. A large while some of those on early retirement schemes would have preferred to be employed if possible. There are 270,000 persons (8.3%) on disability pension and 175,000 (5.4%) on early retirement.

Further, some expelled are to be found within the other groups outside the labour market receiving social assistance or without public income support. These two groups account for more than 6% of the population between 20 and 64 years, and even though there is a large flow in and out of these two groups, some of the persons there are on their way out of the labour market or have in practice been expelled from it.

Some of the outsiders are disqualified by firms due to bad health, abuse, high age or too low qualifications compared to the going wage level, and others make it difficult to attain employment because they only want favourable jobs. Particularly unskilled workers and immigrants are relatively often among the outsiders.

There has been a shift in demand for labour towards people with an education at the expense of unskilled labour. New technology is probably the main reason for this shift as new technology can be seen as a substitute for unskilled labour and has emerged widely in the whole economy. Globalization has to some degree lead to a lower demand for unskilled labour, but the consequences of globalization are much smaller than of new technology.

Immigrants have particular troubles in getting a job. These problems are particularly severe among refugees and immigrants from countries with a low level of income per capita. Especially immigrants coming to Denmark too late for attending primary school seldom have a job as few manage to take an education and they have difficulties in learning the language and the culture. The higher unemployment among immigrants can only partly be explained by their level of education, though discrimination is likely to be a problem, too.

Poor health can on the one hand be due to traffic-accidents, lifestyle or are inheritable and on the other hand due to working conditions causing accidents, sickness or disorder provoked from physical or psychological strain on the job. The kind of working environment with the highest risk of getting unemployed or expelled is found to be jobs characterised by uncertain job security, low degree of influence, physical

strain and where activities are repeated over and over again. These factors are most frequent among unskilled workers. Poor working environment is costly to society as it leads to expensive treatment in hospitals etc. and to a lower production because injured workers are unable to work for some time. Somehow the incentives of the firms to improve the working environment should be increased as the firms only pay private costs of injuries and reduced ability which are a small part of the social cost through insurance towards sickness and accidents on the job. The incentives could be improved by imposing a tax on the insurance premiums paid on industrial accidents and sickness.

People expelled from the labour market are first of all those receiving disability pension. This group is dominated by unskilled workers. Estimations have shown, that unskilled workers in their mid-thirties in 1980 had a much larger likelihood of receiving disability pension by 1997 than people with a formal education. It is likely that the increased probability of being disabled is related to the characteristics of unskilled jobs, but at the same time unskilled workers have a lifestyle which helps to explain the increased risk of disability. This lifestyle is partly due to lower income related to unskilled jobs. Further those who did not have a job among the unskilled in 1980 had the largest risk of getting expelled. This indicates that the argument of poor working environment should not be carried out too far.

The Government and a number of parties are planning a reform of the disability pension legislation. It is suggested that the municipality should be obliged to test a person's working capability and the possibilities of returning to a job, possibly

on special conditions (fewer hours, special equipment etc.) independently of the person's education and earlier career. This demands a more flexible labour market where firms create jobs for persons who are found to have a limited ability to work. In order to meet these demands it is the ambition of the Government that there are established 40,000 jobs in the private and public sector with wage subsidies to the employer. There is, however, a risk that these jobs with subsidy will rule out jobs without subsidy made voluntarily between the employer and the employee. The Chairmanship thus recommends an intensified use of jobs on special conditions made locally on the firms without subsidies. To reduce the number of new outsiders firms should be made responsible for forming an action programme to ensure that persons return to their jobs after a period of sickness. This should take place in coordination with trade unions, employers' organizations and regional authorities.

The labour market policy has been changed to a more active strategy since 1994 where unemployed at an earlier stage are offered and forced to engage in either job training or education. Several programmes have been launched to integrate unemployed into the labour market. The most successful programme is job training in the private sector, but most of the other programmes also increase the participants' chances of returning to employment.

Rehabilitation is a special programme which is used both for rehabilitating disabled persons and for integrating persons who have not been on the labour market before and experience severe problems entering the labour market. The advantages of this programme are

that participants are allowed to get public income support for up to five years and that they are even allowed to take an academic education. Our estimations show that the success of the programme depends on both the basic educational level before starting and the final educational level after the rehabilitation. If the participant finishes an education the probability of success increases significantly.

One basic problem is that the programmes to help outsiders and prevent persons from being expelled from the labour market are initiated and financed by different authorities. The institutions involved are the Employment Service, the municipality and the unemployment funds. The Employment Service is a State institution while the unemployment funds are closely related to the trade unions. Both the Employment Service and the municipality are engaged in active labour market policy including education and job training. Both the Employment Service and the unemployment funds register when an insured person becomes unemployed. The municipality is the only authority which is allowed to start a rehabilitation process and the authority also has to contact persons who receive sickness benefit for more than eight weeks even though the person's employer might be situated in another municipality.

The problems are that several authorities are involved in the same type of programmes without coordinating them, and persons who move around between employment, unemployment, sickness benefit and rehabilitation are contacted by several institutions which have no idea about their past history.

In the light of these problems and some new experiments it is advised to consider the advantages from uniting the Employment Service, the

unemployment funds and the municipalities' labour market activities. A united authority would have better opportunities to initiate the necessary actions at an earlier stage which could lead to fewer outsiders and reduce the number of persons who are expelled from the labour market.

3 A final remark

Policies to raise employment is one action to enhance growth in Europe discussed by Jørgen Elmeskov and Stefano Scarpetta. Low rather than high productivity growth may be part of the solution to Europe's problem, because strong past growth of labour productivity has come as a result of not employing the least pro-

ductive workers and of substitution towards capital forced by high labour costs. This correspond to the Danish experience of raising employment but also relatively low productivity growth and discussion on reform to increase the labour supply. 🐼

References

- The Danish Economic Council (1998 – Spring).** The Danish Economy. Copenhagen.
- The Danish Economic Council (2000 – Spring).** The Danish Economy. Copenhagen.
- Blanchard, O. J., Quah, D. (1989).** The Dynamic Effects of Aggregate Demand and Supply Disturbances. *American Economic Review* 79, 655–673.

WOLFGANG POLT



WOLFGANG POLT
HEAD, INSTITUTE FOR TECHNOLOGY
AND REGIONAL POLICY – JOANNEUM RESEARCH
HELMUT GASSLER
RESEARCH ASSOCIATE, INSTITUTE FOR TECHNOLOGY
AND REGIONAL POLICY – JOANNEUM RESEARCH

Austria –
a case
for a new economic
paradigm?

I Introduction

There is a widespread perception (see e.g. Cohen et al., 2000) that we are entering a “new economic paradigm” or a “new economy”. Yet, what exactly is to be understood by the notion of a “new economy” and whether this phenomenon really exists is not yet clear and still a hotly debated matter.

The basis for the perception of fundamental changes in economic development has been the recent phase of high and sustained economic growth which was accompanied by low rates of inflation – notably in the United States. It is argued by supporters of the notion of a “new economy” that this development is mainly due to the massive investments in information and communication technologies (ICTs) that have occurred in the past decades and that are now beginning to pay-off.

The effects of ICTs on economic development can take different forms and these different forms are often – in various combinations – cited as empirical evidence in support of the hypothesis of the advent of the “new economy”:

- The first is a presumed rise in productivity growth, spurred by ICTs. This effect is also a central link between the phenomena of sustained economic growth and low rates of inflation: A high underlying growth of productivity would ease inflationary pressures throughout the business cycle.
- The second is an effect on growth itself, by enabling the supply of new goods and services (“new growth industries”), e.g. hardware and software sales and related services, the build-up of new communications infrastructure and services etc.

Other effects are more subtle and hence even more difficult to capture than the above mentioned (for an overview of the state of discussion on productivity measurement: OECD, 1999):

- These effects increase the efficiency of markets (making them function more like the “ideal markets” of economic textbooks):
 - The use of ICTs is assumed to lower the costs of information gathering, retrieval and processing, reducing “search costs”.
 - As information (about characteristics of goods, the conditions of their availability, including prices etc.) is becoming more easily accessible and more widespread, the restriction of “incomplete information” for the market agents is alleviated.
- Efficient forms of market transactions (e.g. auctions) become feasible for a greater number of transactions and accessible for a large number of market participants.
- Further, the increase of knowledge and information, rather than being parts of the inputs to the production of (other) goods and services, might also be seen as part of the output (e.g. of teaching, news services, entertainment). An increase in knowledge and information must – in this view – be added to the visible part of the output captured in the GDP statistics.
- In addition, “informational goods” (the “bits”) are said to differ in essential of a distinctive nature from “traditional goods” (the “atoms”):
 - marginal costs of production and distribution are very low, sometimes close to zero,
 - asymmetric information is an inherent dimension of the exchange of information (one can only value the utility of a certain piece of information after consuming it; see Varian and Shapiro, 1999).

Also the latter aspects are likely to affect the ways markets function: they might be the source of “market failure” – making markets functioning less like a perfect neoclassical market. Thus, we see forces at work which act in very different directions, the net effect being unclear yet.

This paper will not be able to touch upon these issues, as there are today hardly valid data to capture these effects. Rather, its goal is more modest: It will briefly outline the debate on the “new economy” in chapter 2 and will go on to ask whether signs of the “new economy” can also be depicted in Austria.

Thus, the main part of this paper constitutes an empirical discussion of certain indicators for a “new economy” (chapter 3) in which we discuss recent developments on a macro-, meso- as well as on a microlevel in an international comparison focusing on the position of Austria. Finally, some tentative conclusions are discussed in chapter 4.

2 What is new in the “new economy”?

There are numerous ways in which the notion of a “new economy” is used. Below, we cite two of the probably more conservative (meaning not falling victim to some present hypes) and authoritative ones. In Alan Greenspan’s words “a perceptible quickening in the pace at which technological innovations are applied argues for the hypothesis that the recent acceleration in labor productivity is not just a cyclical phenomenon of a statistical aberration, but reflects, at least in part, a more deep-seated, still developing, shift in our economic landscape”.¹⁾ Another authoritative source, the OECD links the phenomenon more closely to a specific kind of technologies, namely information and communication technologies (ICTs): “A striking feature of the past decade or so has been the increased role of new technologies, especially in the information and communication technologies (ICT). Investment in ICT equipment is becoming a major driver of labour productivity growth, particularly in the United States and some other countries, and new

technologies have the capacity to increase countries’ potential output significantly, especially if associated with reorganisations of firms, industries and markets. At this stage, however, perhaps also reflecting measurement problems, there still appears to be little empirical evidence of important economy-wide effects linked to the widespread diffusion of these technologies. On the other hand, microeconomic and anecdotal evidence does indicate that businesses are achieving substantial productivity improvements arising from organisational changes”.²⁾

The performance of the U.S. economy over the past decade and especially over the last half of this decade has helped to establish commonly the thinking that the US are some sort of a role model of the emerging “new economy”. Thus, many observers look at the recent development and try to learn from the experiences US businesses as well as employees gained in the early stages of the emergence of the “new economy”.³⁾

Although the GDP growth rate in the USA was remarkable throughout the 1990s (or at least since the recession at the beginning of the 1990s), it was not outstanding in international comparison (see section 3.1 below). Nevertheless a growing number of empirical, growth accounting studies indicate that the contribution of ICTs investments and the ICTs sector in partic-



1 Speech given by Alan Greenspan at the Federal Reserve Bank of Chicago, May 6, 1999, quoted after Gordon (2000).

2 OECD (2000, *Economic Outlook*).

3 The US is not only regarded as being the role model of the “new economy”. It is for sure the nation with the most research efforts in trying to understand the “new economy”. Hence, there exists a huge range of valuable data on de facto every picture of the “new economy”.

Table 1

**Contribution from computer hardware to output growth:
a comparison of recent studies**

Author(s)	Previous period		Current period	
	Years covered	Contribution	Years covered	Contribution
Jorgenson and Stiroh (2000)	1974 to 1995	0.17	1996 to 1998	0.36
Oliner and Sichel (2000)	1975 to 1995	0.27	1996 to 1999	0.62
Whelan (1999)	1980 to 1995	0.37	1996 to 1998	0.82

ular to output and productivity growth was significant and growing compared to previous experiences (see table 1). This encouraged some authors to state that, now at least, the well-known productivity paradox has been diminished.¹⁾

Cohen et al. (2000) argue that ICTs are not just constituting a new “leading sector” (just like air transport in the 1960s or automobiles in the 1920s). In their view ICTs do not only lead to productivity growth and new possibilities (new products, new processes) in just one sector but they offer new “tools” to the economy as a whole. Hence, productivity of the whole economy increases and entirely new products and services lead to higher output.

Yet, this position is not unchallenged: Other economists take a more sceptical stance towards the “new economy”, e.g. Paul Krugman (May 7, NYT): *“Exactly why the old speed limits on the economy were so suddenly repealed remains something of a mystery. Productivity growth suddenly accelerated, probably because businesses started to make effective use of information technology, though we can only guess why infotech paid off so much in the late 1990s after producing such disappointing results in the previous 15 years. At the same time – and therefore presumably for the same reason, though the connection is far from clear – the*

economy developed a new immunity to inflation”.

For a more sceptical view see also Robert Gordon (2000, in this volume). He argues that computers and internet are not in the range of the five great “macroinventions” (electricity, internal combustion engine, chemicals, communication and entertainment, and sanitation infrastructure) of the Second Industrial Revolution around 1870 to 1900, as their impact to other sectors (especially their spillover effects on productivity) remains limited.

Nevertheless, there seems to be a growing agreement among economists that there is a substantial impact of ICTs investments, as the sector itself is fast growing both in production and in productivity and impacts on many other sectors – even though it is not yet sure how far – reaching this impact might be.

Probably – even after two decades of massive ICTs investments in the most advanced countries – we are still at the beginning of the development towards a “new economy”. Or as Richard Lipsey (2000) has put it: *“When computers were initially introduced they entered structures designed for the paper world, merely substituting for human hands and minds. Before they could really pay off, administration and production facilities had to be redesigned both physically and in their*

¹ The productivity paradox refers to the fact, that, despite large investments in new technologies like ICTs, the productivity growth slowed down since around 1973 compared to the 1950s and 1960s. This paradox is highlighted by Solow (1987): *“We can see computers everywhere but in the productivity statistics”.*

command structures. Slowly, again as it was with electricity, the whole process of producing, designing, delivering and marketing goods and services was, and is still being, reorganised along lines dominated by computing technologies. As more and more of the needed changes in the facilitating structure are identified and accomplished, we can expect that, as with electricity, the latent power of the new technology to raise productivity will be seen in measured productivity growth – as it is in many sectors already”.

3 Austria on the road to the “new economy”? Some comparisons

In the following chapters we will describe the Austrian performance in terms of growth and productivity change, offer some explanations for this development and go on to identify whether the production, diffusion and use of ICTs in Austria has already reached a level which would one lead to expect to see signs of a “new economy”. As of yet, there are no more elaborate studies available for Austria, which would look closer into the causal relationship between ICTs and economic per-

formance. Thus the figures we give might only serve as an indication that there is – in terms of ICTs investments and use – a basis laid for a “new economy”.

3.1 Macrolevel

On the macrolevel, we compare growth rates of GDP, productivity and inflation between OECD countries and Austria. Despite the fact that the United States have recently gained the status as a “growth miracle” in the popular press, the overall pattern of growth within the OECD area is characterised by a significant catching up process. Hence, the last three decades were marked by a significant convergence process within the OECD area. The poorer a country has been at the beginning of the 1970s the higher the growth rate between 1970 and 1998 (see Barro and Sala-I-Martin, 1995). Figure 1 shows the empirical evidence of this catching-up process. The idea behind the catching-up thesis is that lagging countries have some generic advantages due to their possibility to benefit from technology, innovations, know-how and experiences

Figure 1

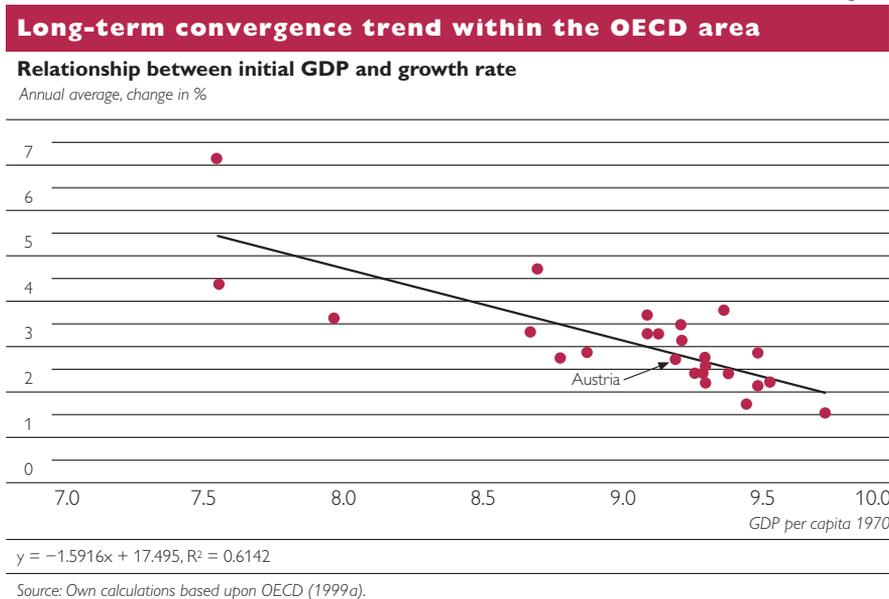


Table 2

GDP growth rates in the OECD**Comparison between different time periods**

	1970 to 1998	1970 to 1979	1980 to 1989	1990 to 1998	1995 to 1998
	Annual average rate in %				
AU	3.3	3.3	3.5	3.3	4.0
AT	2.7	3.7	2.0	2.1	2.6
BE	2.4	3.2	1.8	1.8	2.3
CA	3.1	4.5	3.0	2.2	2.9
CZ	–	–	–	0.5	0.6
DK	2.2	2.5	2.0	2.7	3.1
FI	2.7	3.2	3.4	1.4	4.6
FR	2.4	3.4	2.3	1.4	2.1
DE	–	–	–	1.3	1.6
West DE	2.1	2.9	1.9	1.3	1.6
GR	2.7	4.9	1.8	1.7	2.6
HU	–	–	–	–0.6	2.4
IS	3.7	6.2	2.9	2.0	4.3
IE	4.7	4.8	3.1	6.1	8.7
IT	2.4	3.5	2.2	1.2	1.2
JP	3.3	4.5	3.8	1.3	1.2
KR	7.1	8.4	8.6	5.2	1.8
LU	3.8	2.7	4.6	4.6	3.3
MX	3.6	6.2	1.4	2.6	5.4
NL	2.5	3.1	2.0	2.5	3.1
NZ	2.0	1.7	2.6	2.1	1.5
NO	3.5	4.6	2.4	3.6	3.7
PL	–	–	–	3.7	6.3
PT	3.3	4.6	2.7	2.3	3.2
ES	2.9	3.7	2.9	2.1	3.3
SE	1.7	2.0	2.1	1.0	1.9
CH	1.5	1.0	1.8	0.5	1.3
TR	4.4	4.7	4.7	4.1	5.6
GB	2.2	2.4	2.9	2.0	2.7
US	2.9	3.4	3.0	2.6	3.7

Source: OECD (1999 a).

of the leading countries without having to pay the full costs. Thus they are able (at least under certain circumstances, see Abramowitz, 1991 for a detailed discussion) to raise their growth (and productivity growth) rates at a comparatively rapid rate. From table 1 it can be obtained that poorer countries were able to sustain growth which are (on the average) significantly higher than growth rates of already (in 1970) rich countries.

Though there is some empirical evidence that the rise in output and productivity growth is at least to a certain extent associated with technological development and investment in ICTs in some countries (notably in the US, UK and Canada, see Schreyer, 2000) the overall picture is certainly not clear.

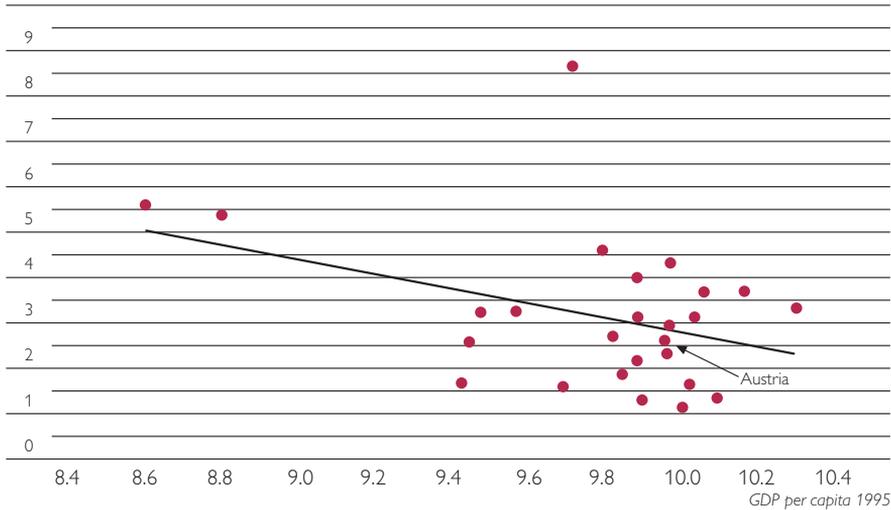
While the pace of growth slowed down generally in the 1990s compared to the 1980s, the spread of growth rates between countries within the OECD area increased in the same period (see table 2). There are some notable exceptions of the trend towards reduced growth rates (especially Ireland). Nevertheless, there seems to be a general trend of rising growth rates in the second half of the 1990s. Only 4 of 30 countries of the OECD area had lower growth rates in the period 1995 to 1998 as in the whole period 1990 to 1998. Among these notable outsiders are Japan and Korea, both heavily affected by the Asian financial crisis of the late 1990s. In terms of productivity (measured as private business sector output per employed person or per

Figure 2

The short run: convergence vanished

Relationship between initial GDP and growth rate, 1995 to 1998

Annual average, change in %



$$y = -1.6032x + 18.893, R^2 = 0.138$$

Source: Own calculations based upon OECD (1999a).

working hour) the pattern is even more diverse. Austria was doing quite well, with an average annual GDP growth rate of 2.6% between 1995 to 1998, it was in the range of the median.

Though we demonstrated that in the long run a catching-up process within the OECD is observable, during recent years this catching-up tendency might be vanished. This is shown in figure 2. Between 1995 and 1998 there was only a very weak negative relationship between the growth rate and the initial GDP per capita. This indicates that poor countries were not able to grow much faster than the rich countries.

Labour productivity growth

In table 3 the development of the growth of labour productivity of the OECD countries is given. Con-

trary to the thesis that ICTs enhance productivity in a couple of countries the productivity performance (measured as output growth per employed person and per working hour, respectively) was worse during 1995 to 1998 than 1990 to 1995 (and in some countries even worse than 1980 to 1990). Notable exceptions are the US, Australia, Switzerland, Iceland, Greece, and Austria.¹) (In Ireland only output per employed person has grown faster but not output per working hour.)

Inflation

One of the main arguments of the proponents of the “new economy” is that the interplay between rising productivity, falling (or at least only moderately growing) producer costs and the higher competitive pressure leads to falling inflation rates.

¹ Although for Austria no information on output growth per working hour for previous periods is reported by the OECD, it is very likely that this figure has grown. The growth between 1995 and 1998 was very pronounced and given the fact that output per employed person has grown faster than in previous periods and working hours did not change that much the output per working hour must have grown faster either.

Table 3

Productivity development in the OECD area

Comparison between the 1980s and the 1990s

	Output (business sector GDP)			Output per employed person			Output per hour		
	1980 to 1990	1990 to 1995	1995 to 1998	1980 to 1990	1990 to 1995	1995 to 1998	1980 to 1990	1990 to 1995	1995 to 1998
US	0.02	2.5	4.5	1.2	1.2	2.1	1.3	1.0	2.2
JP	4.1	1.5	1.1	2.8	0.9	0.9	3.3	2.4	1.6
DE	2.4	1.6	1.8	1.9	2.4	1.9	2.6	2.2	1.9
FR	2.4	1.0	2.5	2.5	1.6	1.6	3.3	2.1	1.9
IT	2.3	1.4	1.4	1.9	2.5	1.1	2.2	3.0	0.8
GB	3.2	2.6	3.0	2.5	1.9	1.3	3.0	2.1	1.6
CA	2.8	1.8	3.3	1.2	1.4	0.9	1.3	1.5	1.1
AU	3.6	3.3	4.8	1.2	2.2	3.2	1.3	2.1	3.5
AT	2.3	1.9	3.0	2.4	1.5	2.8	–	–	6.2
BE	2.0	1.5	2.5	2.0	1.7	1.2	–	2.4	1.3
CH	2.1	–0.2	1.5	0.5	0.8	1.2	–	0.7	2.3
CZ	–	4.3	0.5	–	3.3	1.3	–	–	1.2
DK	1.9	3.0	3.2	1.7	3.7	1.2	–	3.6	0.6
ES	2.7	1.3	3.5	2.6	2.7	0.8	3.5	2.8	0.7
FI	3.0	–0.5	5.8	3.1	4.3	3.3	3.6	4.1	3.6
GR	1.3	1.4	3.3	0.6	0.8	2.6	–	0.7	2.5
HU	–	0.2	3.8	–	6.1	3.2	–	4.9	2.8
IE	4.3	4.9	9.7	4.5	2.9	3.0	–	3.9	3.7
IS	–	0.5	5.5	–	1.0	3.3	–	1.1	3.6
KR	9.4	7.5	1.9	6.5	5.2	2.8	7.2	5.5	4.1
LU	–	5.3	4.9	–	2.9	1.7	–	3.5	2.3
MX	–	0.9	5.6	–	–1.7	2.0	–	–2.1	1.2
NL	2.2	2.2	3.7	1.6	1.4	0.7	3.3	2.9	0.2
NO	1.0	2.4	4.2	1.1	2.8	1.4	–	3.0	1.7
NZ	1.8	3.3	1.8	1.5	0.3	0.6	–	0.0	0.9
PL	–	5.5	6.7	–	7.5	5.4	–	7.7	5.7
PT	2.7	1.5	3.8	1.6	3.7	2.2	–	4.3	3.9
SE	2.3	1.0	2.4	1.7	3.2	2.1	1.5	2.3	1.9
TR	5.3	3.2	5.7	4.1	1.2	3.8	–	–	–

Source: OECD (1999 a).

Indeed, the 1990s have been a decade of an impressive reduction of inflation rates, even to such a level, that fears of an era of deflation have been raised, at least in some coun-

tries, like for instance Japan. The reduction in inflation rates is observable throughout the whole EU area (and this holds true for the USA and Japan as well). Even former

Table 4

Recent inflation rates in EU Member States

	1994	1995	1996	1997	1998
	Annual change in %				
BE	+ 2.4	+1.4	+1.8	+1.5	+0.9
DK	+ 2.0	+2.3	+2.1	+1.9	+1.3
DE	+ 2.7	+1.6	+1.2	+1.5	+0.6
FI	+ 1.1	+1.0	+1.1	+1.2	+1.4
FR	+ 1.7	+1.7	+2.1	+1.3	+0.7
GR	+10.9	+9.0	+7.9	+5.4	+4.5
IE	+ 2.4	+2.4	+2.2	+1.2	+2.1
IT	+ 3.9	+5.4	+4.0	+1.9	+2.0
LU	+ 2.2	+1.9	+1.2	+1.4	+1.0
NL	+ 2.7	+1.1	+1.4	+1.9	+1.8
AT	+ 3.0	+2.0	+1.8	+1.2	+0.8
PT	+ 5.2	+3.8	+2.9	+1.9	+2.2
SE	+ 2.5	+2.9	+0.8	+1.8	+1.0
ES	+ 4.8	+4.7	+3.6	+1.9	+1.8
GB	+ 2.5	+3.0	+2.5	+1.8	+1.5

Source: Statistics Austria, 2000.

“problem countries” with historically high inflation rates like Greece or Italy experienced a remarkable decrease of their inflation rates (see table 4). Countries with traditionally “hard” currencies like Germany and Austria were even able to reduce their inflation rates below 1 percentage point. A point where some observers argue that, due to rising product qualities, which are not measured directly, inflation is actually come to a halt.

The figures show that relatively high rates of growth of GDP and productivity (sometimes also in combination with moderate inflation) is achieved by a number of countries. However, not all of these countries can really be labelled as “role models of the emerging new economy”. This leads us to the believe, that even in the present “ICTs revolution”, there are a great number of other factors affecting GDP and productivity growth and inflation (e.g. tight monetary policies in the EU countries, sustained catching-up phenomena in other OECD countries) – and hence of possible alternative growth trajectories for the various countries. This is not to deny that for countries at the “tech-

nological frontier” – like the US, Japan and some European countries – the most probable growth trajectory would be one based on the growth of ICTs (and the related changes in the structure and functioning of the economy described in chapter 1).

3.2 Mesolevel

On the mesolevel, we describe employment, turnover, investments etc. in ICTs (and some selected components of ICTs) and the spillover effects of ICTs into other sectors. The variation of the economic importance of the ICTs sector is very high within the OECD area (see figure 3). The USA remains the leading country, Europe on the average (as well as Japan) is still lagging in regard of ICTs/GDP. However, within Europe the disparities are large as well, with the Nordic countries (plus Switzerland) being on the top position. Austria is in a somewhat lagging position.

Table 5 shows the number of employment, the growth rate as well as the relative importance of various ICTs sectors. With about 155,000 employees the share of ICTs on total employment is 5.1% which

Figure 3

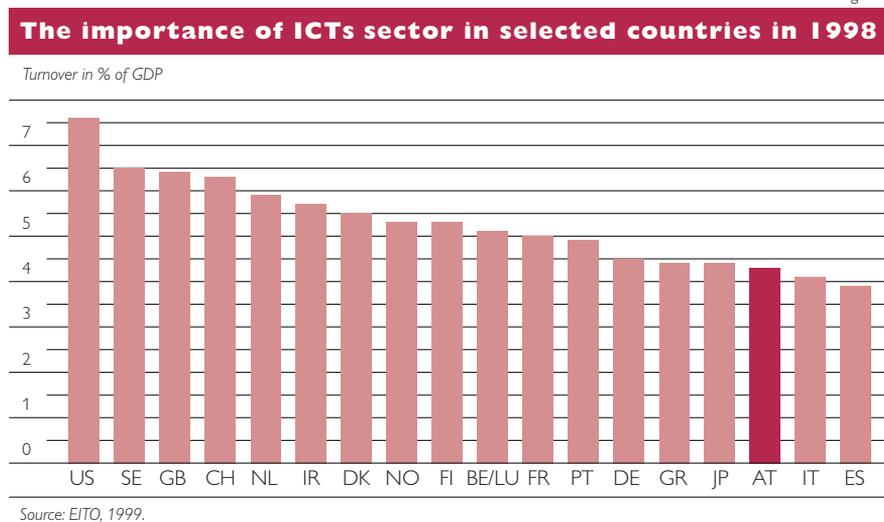


Table 5

NACE	Employment in the ICTs Sector in Austria				
	1997	1999	change in %	1997	1999
	Persons			% of total employment	
30 Office machinery and computers	1,680	1,268	-24.52	0.1	0.0
31 Electrical machinery and apparatus n.e.c.	21,878	20,316	- 7.14	0.7	0.7
32 Radio, television and communication equipment	30,973	32,892	+ 6.20	1.0	1.1
33 Medical, precision and optical instruments	14,774	14,299	- 3.22	0.5	0.5
64 Post and telecommunications	64,435	66,250	+ 2.82	2.1	2.1
72 Computer and related activities	13,610	20,369	+49.66	0.4	0.7
Total	147,350	155,394	+ 5.46	4.8	5.1

Source: Leo (2000) based on HV data.

is remarkable.¹⁾ Employment is growing in recent years both in absolute terms (increase of 5.5% between 1997 and 1999) as well as in relative terms. Somewhat surprisingly, the ICTs share of employment is higher in Austria than in the USA²⁾ and slightly higher than in Europe (EU-10). However, this must not be interpreted as an competitive advantage for Austria since it may reflect inefficiencies, for example in the telecom sector, where the former incumbent still has to adopt to the already opened markets (Leo, 2000). Indeed, the share of post and telecommunications in Austria is twice as high than in the US.

The sectoral distribution is dominated mainly by services like post and telecommunications and computer and related activities, respectively. These service-oriented activities account for 55.7% and their share of ICTs employment increased by 2.8 percentage points from 1997 to 1999. Computer and related activities experienced a rapid expansion of employment (+50% within three years!). Despite the ongoing rationalisation process of the state owned postal and telecom

operator, employment of the subgroup post and telecommunications increased too (of course, with 2.8% on a very lower scale) indicating that the rapid entry of new telecom providers has already significant employment effects. With the exception of radio, TV and communication equipment, the hardware sector is decreasing in terms of employment.

In figure 4 we demonstrate the position of various manufacturing sectors in Austria concerning R & D and share of value added in comparison with the OECD average. Therefore we graphed a portfolio in which the x-axis depicts the share of GERD³⁾ (relative difference to the OECD average) and the y-axis depicts the share of value added of a certain industrial sector (again the difference to the OECD average). The size of the circle indicates the absolute amount of value added of a particular industrial sector. Hence, sectors in the north-eastern quadrant of the portfolio are both above the OECD level of GERD as well as of the average OECD share of value added. Sectors belonging in this quadrant are sectors which Austria is specialised (compared to the

1 For comparison, the tourism sector, a sector which Austria is very specialised in, accounts for about 6% of total employment.

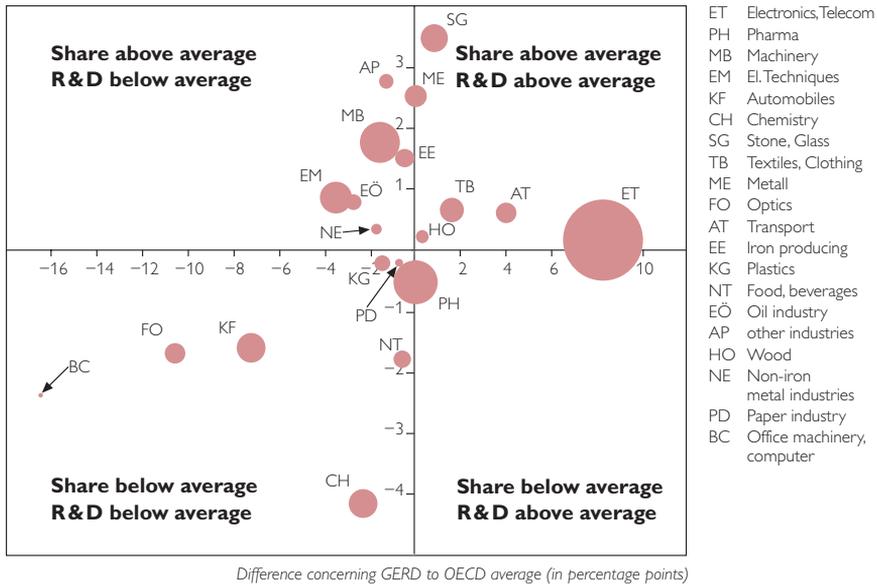
2 Though the data for the USA and EU-10 are for 1996.

3 GERD is the acronym for gross expenditures on research and development. Here, GERD is measured as share of total value added in each industrial sector.

Figure 4

Portfolio of R&D and value added in Austrian manufacturing

Difference to OECD average (in percentage points)



Source: Gassler, Polt, Rammer (1999).

OECD average) in and with a higher GERD/value added ratio.

It can be obtained that especially one sector, office machinery and computers, has only a tiny share of manufacturing value added in Austria and, additionally a very bad R&D performance compared to the OECD average. However, one sector, which is (at least partly) associated with ICTs, namely electronics

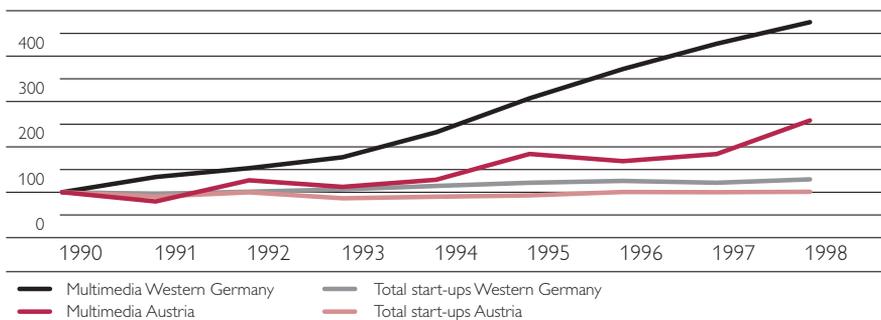
& telecom has a quite strong position, both concerning value added as well as R & D.

One new emerging sector, namely multimedia, has gained increasing interest during recent years (see Warta, Peneder, Knoll, 1997, for a detailed discussion of the Austrian situation concerning multimedia). In figure 5 we give some evidence of the recent develop-

Figure 5

New firm formation in the multimedia sector: a comparison of Austria and Western Germany

Index 1990 = 100



Source: Almus et al. (2000).

ment of this new emerging sector in Austria in comparison with Germany. Using firm formation (number of new start-ups) as a measure of the dynamics, it can be obtained from figure 5 that Austria is somewhat a laggard. Since 1990 multimedia firm formation has spurred in Western Germany, the number of start-ups in 1998 was fivefold higher than in 1990. This means that the average annual growth was as high as about 23%! Though firm formation in multi-



media experienced a take off in 1994 in Austria, too, the growth is by far lower than in Germany. The index of the number of start-ups in Austria reaches a value of about 260. Of course, this is remarkable as well, but in comparison to Germany a little bit disappointing. In addition, growth in Austria was not smooth, in some years the number of start-ups even declined.

Thus, in terms of ICTs production, Austria seems to lag the development of the most advanced countries. Behind this general positioning there is hidden a very diverse specialisation pattern of Austrian manufacturing, with weak positions in “Office machinery and computing” and some strongholds in “Telecommunication” and “Electrical equipment”. But even in sectors where Austria is relatively weak, there have been encouraging signs of growth recently (e.g. multimedia).

3.3 Microlevel

On the microlevel, we present data from various sources (e.g. OECD, 2000; EITO, 1999, 2000) on the use of different ICTs (PCs, internet access, mobile phones etc.) as well as their development over time. We

consider these indicators as especially important. First, as it is only with the widespread diffusion of ICTs that one could expect to see substantial economic effects. Second, it is the use of ICTs e.g. for internet-based services and e-commerce that lay the basis for most of the changes in the functioning of markets associated with the “new economy”. Hence, these technologies are the “infrastructure” of the markets of the “new economy”.

Austria was traditionally a late adopter in most parts of ICTs among the rich industrial countries. However, recent evidence shows that Austria cannot be depicted anymore as being a laggard concerning diffusion and adoption of ICTs. In the last couple of years, Austria experienced a rapid catching-up process and was even able to leapfrog some countries.

Mobile phones

The number of mobile phone users skyrocketed in Austria during the last couple of years. The adoption rate was traditionally below the European average but gained momentum after the full scale liberalisation of the mobile phone market in the middle of the 1990s. Newest estimates indicate that the penetration rate will exceed 70% throughout the year 2000. Thus, Austria is now (first quarter 2000), behind the Nordic countries, one of the most densely connected countries concerning mobile phone penetration (see figure 6).

PCs

Traditionally, Europe lags behind the United States concerning the penetration rate of personal computers, measured for example in PCs per inhabitants. In 1998 in EU-14 (excluding Ireland for which data are not available) there were 27.7 PCs per 100 inhabitants while in

Figure 6

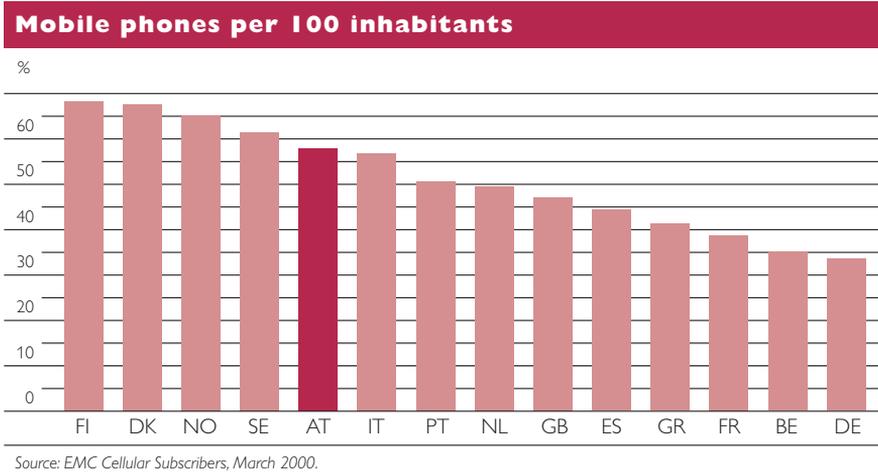
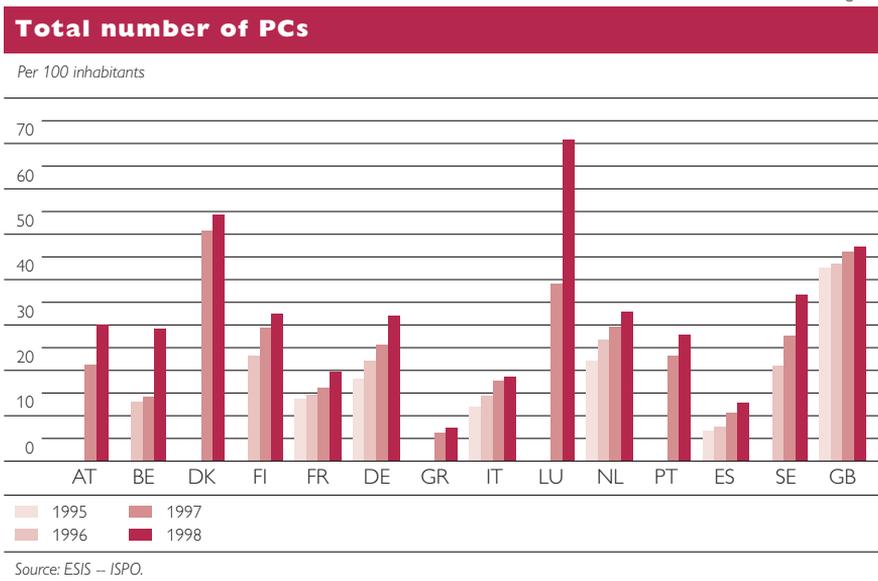


Figure 7



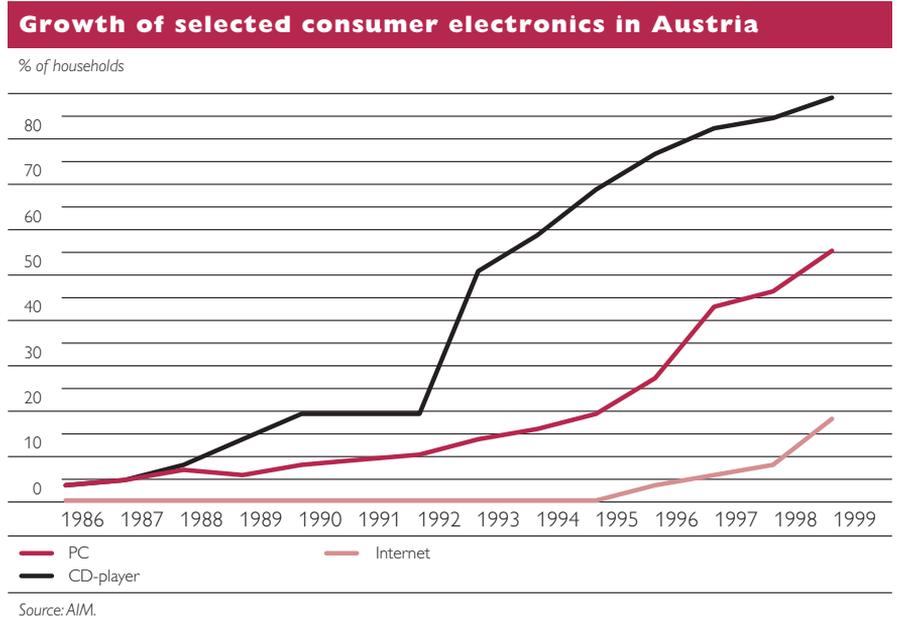
the United States the same measure amounts to 47 (and this is for the year 1997). However, at least in some countries, there are high growth rates and reached comparatively high levels of PC penetration (see figure 7). In 1998 Luxembourg, the United Kingdom, Finland and Sweden are on the top concerning the number of PCs per 100 inhabitants. With 30 PCs per 100 inhabitants Austria is already above the EU-14 average and was able to achieve a high growth rate between 1997 and 1998 as well (50% or about

10 percentage points). Factual evidence (obtained for example from market polls published frequently in popular media) indicates that this strong growth process concerning PC penetration in Austria continued during the last two years and it is very likely that this trend will continue throughout the next years (see figure 8).

Access to internet

Due to severe measurement problems and differences between the measurement methods international

Figure 8



comparisons of access to internet are notoriously difficult. Hence, the data given in table 6 should be read with caution. Nevertheless a broad picture can be obtained, though the exact ranking of the countries should be taken not too seriously. The nordic countries still take the lead in

internet adoption with penetration rates well over 50%. These countries are now quite in the same league (or even above that level) as the US Generally, there seems to be a somewhat North-South divide concerning internet adoption within Europe. Austria, regarded as a laggard by

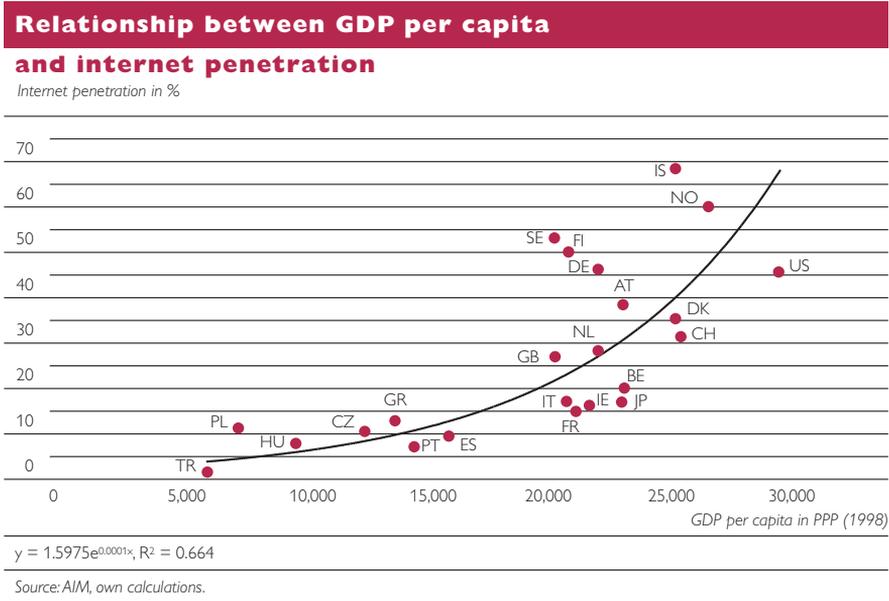
Table 6

Number of internet users

State	Date	No. (in 1,000)	Surveyed age group	% of total
IS	1999 Nov.	134.3	16-75	68.9
NO	2000 March	2,224	13+	60.2
SE	2000 April	3,813	Dec. 99	53.6
FI	2000 Feb.	1,950	15-74	50.1
DE	2000 Jan	24,300	14-69	45.8
AT	2000 1 st Quarter	2,570	14+	39.0
DK	1999 Oct.	1,900	0+	35.5
CH	1999 Sep.	1,761	14+	31.5
NL	2000 Feb.	4,500	0+	28.5
GB	2000 Jan.	15,700	0+	26.6
SI	1999 July	460	15+	26.0
BE	2000 Jan.	2,000	12+	19.6
IT	2000 March	9,300	0+	16.4
IE	2000 March	592	0+	16.3
FR	2000 March	9,000	0+	15.3
GR	1999 Oct.	1,330	0+	12.4
PL	1999 Aug.	3,345	15+	11.0
CZ	1999 Nov.	840	15-79	10.3
ES	1999 Dec.	3,625	..	9.3
HU	1999 Jan.	669	15+	8.0
PT	1999 Oct.	565	0+	5.7
US	2000 Feb.	123,600	0+	45.3
JP	2000 March	21,210	0+	16.8

Source: AIM.

Figure 9



many observers, is now with a penetration rate of almost 40% among the leading countries. In the first quarter of 2000 the total number of internet users is estimated of astonishing around 2.6 million.

There is a clear cut relationship between GDP per capita and internet penetration. However, this relationship tends to be of non-linear nature. In figure 9 we demonstrate the exponential relationship between wealth and internet penetration. Since Austria, as well as the Nordic states, are above the trend curve, it can be suggested that Austria is a country with a surprisingly high level of internet penetration.

EDI

Within the business sector EDI use increased formidable, especially in certain sectors. Although the penetration rate in Austria is with 2.6% quite low (especially in comparison with some leading countries like for example Denmark [40%] or the United Kingdom [33%]), the growth rate is remarkable (46% between

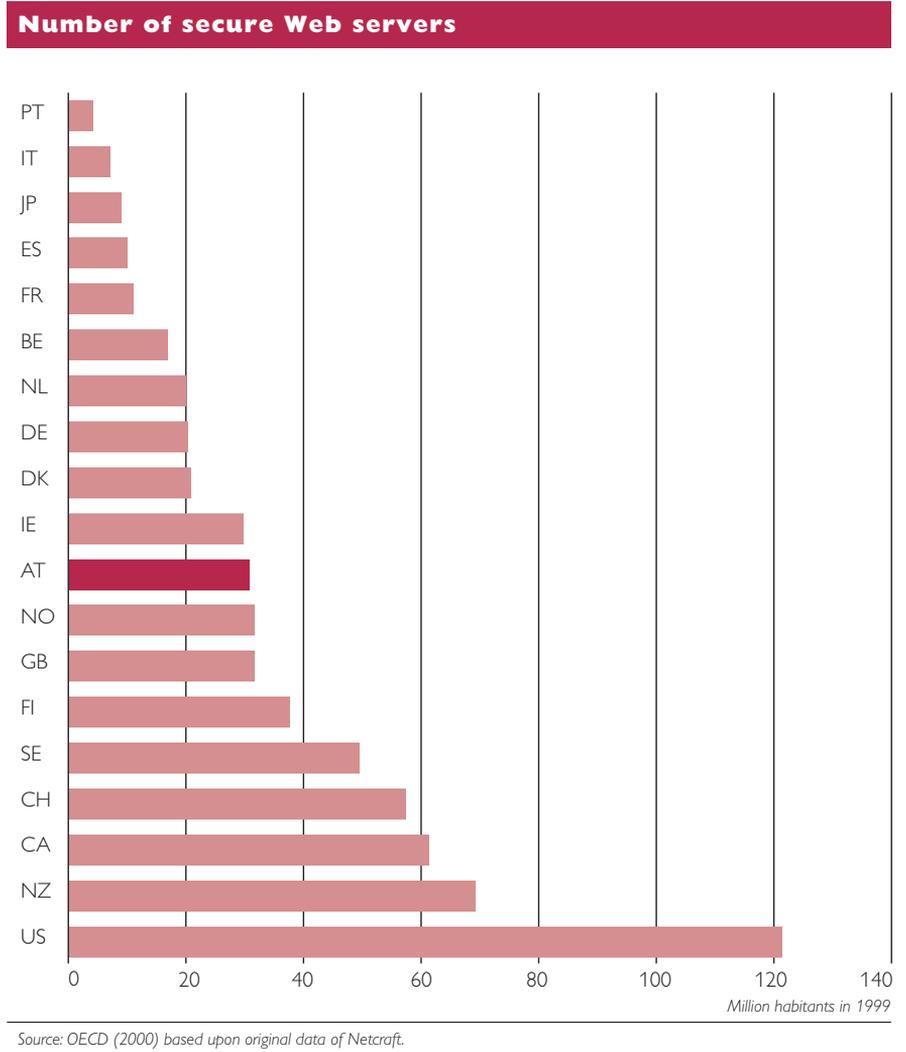
1997 and 1998). About 8000 companies, mainly medium- and large-sized, use EDI. The favoured sectors are trade & consumer goods, banking, automobile, building construction (source: ESIS – ISPO).

E-commerce

Contrary to widespread popular belief, business-to-business e-commerce (B2B) is and will be certainly for the next future outgrowing the much hyped business-to-consumer (B2C) market in terms of turnover or value added. Estimates from the US suggest that B2B is about 5 (Gartner Group) up to 10 to 20 times larger than B2C (Coltman et al., 2000).¹⁾ The reasons why businesses are much more willing to negotiate, buy and sell online than private consumers are multiple, among them the better equipment, the real cost reduction possibilities of online procurement, the fact that most business transactions had been conducted already over distance in the past, strong network externalities etc. Informa-

1 Of course this is by no means surprising, since the volume of trade between companies dwarfs consumer spending.

Figure 10



tion about the volume of B2B in Austria is rare. Based on the (somewhat crude) assumption that the ratio of B2B to B2C is the same in Austria as in the US the current estimated volume might be in the range of about ATS 40 billion to ATS 80 billion. Using the ratio estimated by Gartner Group the volume of B2B would be reduced to ATS 20 billion.

One method to estimate the importance of e-commerce (B2C) is to count the number of secure Web servers. An international com-

parison for selected OECD countries of the number of secure Web servers per million inhabitants is given in figure 10. The US is in a definite leading position. Austria is in the middle range, indicating that although Austria is not on the forefront of e-commerce supply but nevertheless outperforms such countries like Denmark, Germany, Belgium, Japan or Italy.

A recent study by Latzer and Schmitz (2000) based upon a survey of 1,000 regular internet users¹⁾ tries to estimate the total volume of B2C

1 The survey was a special part of the regular Austrian Internet Monitor (AIM) conducted by Fessel-GfK/Integral.

in Austria. Using average annual online spending of ATS 7,457.– and a percentage of 34.4% (or 543,520 persons) of online users who actually buy online, the authors estimate a total volume of about ATS 4.05 billion. This amounts to the rather tiny share of total retail trade of 0.76%. Nevertheless the growth prospect is huge. This is due to the following reasons:

- As online users become more experienced and the online supply grows the amount of average annual spending will increase.
- Two thirds of internet users do not buy online. Empirical work (Schwarz, 1999) shows that the propensity to buy online grows significantly with internet experience. Hence, it is to be expected that the share of online buyers will grow over time.
- PC penetration and internet usage is growing rapidly in Austria. Therefor the number of potential buyers grows as well. A certain share of these new internet users will buy online as well.

To sum up, it seems that Austria has been catching up very rapidly in the use of ICTs in most recent years. This development might lay the basis for an intensive exploitation of the potential benefits of the ICTs in terms of new services, increased market efficiencies and new ways of doing business – for which Austria seems at no disadvantage in comparison to many other developed countries.

4 Conclusions

We tried to show that relatively high rates of growth of GDP and productivity (sometimes also in combination with moderate inflation) are achieved by a number of countries. However, not all of these countries can really be labelled as “role models of the emerging new economy”. This leads us to believe, that even in the present “ICTs revolution”, there are a *great number* of other factors affecting GDP and productivity growth and inflation (e.g. tight monetary



policies in the EU countries, sustained catching-up phenomena in other OECD countries) – and hence of *possible growth trajectories* for the various countries. This is not to deny that for countries at the “technological frontier” – like the US, Japan and some European countries – the most probable growth trajectory would be one based on ICTs.

In terms of *ICTs production*, Austria seems to lag the development of the most advanced countries. Behind this general positioning there is hidden a very diverse specialisation pattern of Austrian manufacturing, with weak positions in “Office machinery and computing” and some strongholds in “Telecommunication” and “Electrical equipment”. But even in sectors where Austria is relatively weak, there have been encouraging signs of growth recently (e.g. multimedia).

During recent years, Austria experienced a rapid catch up concerning ICT use, e.g. in terms of

mobile telephony, where Austria is now a member of the top countries, but also concerning PC penetration and internet use. This development might lay a good basis for the exploitation of the potential benefits of the ICTs in terms of new services, increased market efficiencies and new ways of doing business – for which Austria seems at no disadvantage in comparison to many other developed countries. In our perception, the advanced use of ICT is at least as important to benefit from “new economy” phenomena as their production.



Thus, one can conclude by extending Keith Pavitt’s words to include Austria when he says: “Today, there is concern about European backwardness in ICT,

reflected in its relatively poor performance in trade, output, R&D and international patenting in electronics and office machinery, compared to the USA, Japan and other countries in East Asia. However, the evidence and policy implications need to be interpreted with care. As in the early stages of all revolutions, the signals are incomplete, confusing and sometimes misleading. In particular, it is ... important to distinguish ICT as an industry from ICT as a knowledge base.” (Pavitt, 1998, 565)

References

- Abramowitz, A. (1991).** The postwar productivity spurt and slowdown. Factors of potential and realization. In: OECD (ed.): Technology and Productivity. The Challenge for Economic Policy. Paris.
- Almus, M., Egelin, J., Engel, D., Gassler, H. (2000).** Berichterstattung zum Unternehmensgründungsgeschehen in Österreich bis 1998. In: ZEW Dokumentationen, Nr. 00–06.
- Barro, R. J., Sala-I-Martin, X. (1995).** Economic growth. Mc Graw-Hill. New York et al.
- Brynjolfsson, E., Hitt, L. M. (1998).** Beyond the Productivity Paradox: Computers are the Catalyst for Bigger Changes. Communications of the ACM.
- Cohen, S., DeLong, B., Zysman, J. (2000).** Tools for Thought: What is New and Important About the “E-conomy”, In: BRIE Working Paper, No. 138.
- Coltman, T., Devinney, T. M., Midgley, D. F. (2000).** E-Business: Revolution, Evolution or Hype? Manuscript, Center for Corporate Change, Australian Graduate School of Management, Sidney.
- EITO (1999).** European Information Technology Observatory 1999, EITO, Frankfurt.
- EITO (2000).** European Information Technology Observatory 2000, EITO, Frankfurt.
- Gassler, H., Polt, W., Rammer, Ch. (1999).** Erhöhung der österreichischen F&E-Quote bis 2005: Modellrechnungen. OEFZS-S-0032, Seibersdorf.
- Gordon, R. J. (1998).** Monetary Policy in the Age of Information Technology: Computers and the Solow Paradox, In: NBER Working Paper, June.
- Gordon, R. J. (1999).** Has the “New Economy” rendered the Productivity Slowdown Obsolete? In: NBER Working Paper, June.
- Gordon, R. J. (2000).** Does the “New Economy” Measure up to the Great Inventions of the Past? In: Journal of Economic Perspectives (forthcoming).
- Jorgenson, D. W., Stiroh, K. J. (2000).** Raising the Speed Limit: U.S. Economic Growth in the Information Age. In: Brookings Papers on Economic Activity, 31:1, (forthcoming).
- Lipsey, R. G. (2000).** Sources of Continued Long-run Economic Dynamism in the 21st Century. In: OECD (ed.): The Future of the Global Economy. Towards a Long Boom? pp. 33–76, Paris.
- Latzer, M., Schmitz, S. W. (2000).** Business-to-Consumer eCommerce in Österreich: eine empirische Untersuchung. In: Latzer, M. (ed.): Mediamatikpolitik für die Digitale Ökonomie. eCommerce, Qualifikation und Marktmacht in der Informations-

- gesellschaft, 286–306. StudienVerlag, Innsbruck.
- Leo, H. (2000).** Arbeits- und Qualifikationsnachfrage im Telekom- und Mediensektor. WIFO: Vienna.
- OECD (2000).** OECD Information Technology Outlook, ICTs, E-Commerce and the Information Society, Paris.
- OECD (1999 a).** Economic growth in the OECD area: are the disparities growing? DSTI/EAS/IND/SWP(99)3, Paris.
- OECD (1999 b).** The Economic and Social Impact of Electronic Commerce. Preliminary Findings and Research Agenda, Paris.
- Oliner, S. D., Sichel, D. E. (2000).** The Resurgence of Growth in the Late 1990s: Is Information Technology the Story? In: Journal of Economic Perspectives (forthcoming).
- Schwarz, W. (1999).** Electronic commerce in österreichischen Betrieben: Nutzen und Leistungsqualität aus wirtschaftsgeographischer Sicht. Unpublished Master Thesis, Johannes Kepler Universität, Linz.
- Schreyer, P. (2000).** The contribution of information and communication technology to output growth: a study of the G7 countries. In: STI working paper 2000/2.
- Smith, M. D., Bailey, J., Brynjolfsson, E. (1999).** Understanding Digital Markets: Review and Assessment. In: Brynjolfsson, Kahin, B. (eds.): Understanding the Digital Economy, MIT Press, Cambridge, Mass.
- Varian, H., Shapiro (1999).** Information rules. A strategic Guide to the Network Economy. In: Harvard Business School Press, Boston.
- Warta, K., Peneder, M., Knoll, N. (1997).** Multimedia, Kultur und Konvergenz: Perspektiven einer Clusterbildung in Österreich. In: tip-report, Vienna.

VICENTE SALAS FUMÁS



The growth prospects of the Spanish economy

Introduction

The paper “New sources of economic growth in Europe” presents detailed evidence on recent trends in GDP growth per capita among OECD countries, with an underlying objective in mind: To find out if the extraordinary growth trends of the US economy during the nineties are likely to be sustainable in the future, and if one can expect that such robust growth trends will also emerge in Europe. The paper concludes that growth of the US economy can be basically explained by the dynamic total factor productivity growth driven by the spread of the information and communication technologies (ICT). As soon ICT starts to boom also in the European countries, we should observe the same growth pattern as in the United States. But the paper also makes the point that Europe has a high growth potential by just getting more people to work, that is by increasing current employment levels and approaching them to those prevailing in the USA. As we shall see below, Spain is a country which has just contributed to European’s growth by increasing employment, not by increasing productivity.

In my opinion the paper provides useful information and a very up-to-date analysis of the contribution of ICT to economic growth, especially in the most developed countries (G-7). One important limitation to rounding off the paper with the Spanish experience is the lack of reliable statistics about the spread of ICT in the Spanish economy. Therefore my exposition can only address this issue indirectly by looking at the structural conditions which may influence the diffusion of ICT in



the Spanish economy, in particular human and technological capital endowments, and institutional reforms. These topics will complement the main paper in a different way, since this will allow me to introduce some remarks on the differences in R & D efforts across countries (not considered in the main paper) and to point towards some institutional factors that may affect European economic growth.

Section one looks at the recent performance of the Spanish economy in terms of the convergence of its GDP per capita to GDP per capita in the European Union. In section two the exposition focuses on two of the main sources of long-term economic growth, human and technological capital accumulation. The last section considers the institutional conditions that may affect the economic development of the country in the future and how such conditions interact with institutional development at the European level.

The recent performance of the Spanish economy

During the second half of the nineties, the Spanish economy performed very well compared with previous periods and compared with the performance of the European Union as a whole. For example, Spanish GDP grew at an average annual rate of 3.8 to 4%, while in the European Union GDP growth came only to 2.5%. Unemployment, which represented 20.8% of the active population in 1997, declined to 15.8% in 1999, and forecasts predict that it will be only 12.7% in the year 2001. The unemployment rate in the European Union declined from 10.8% in 1997 to 9.4% in 1999. During the years 1997 and 1998 the number of employed people increased in 400.000 persons per year (2.64% of the employed population) and in 1999 the number of employed people was 3.3% higher than in the year before. The year 2000 forecasts indicate GDP growth of 4% and employment growth of 3% (500,000 new jobs in the year). This helped bring Spain's income per capita 2 percentage points closer to real convergence with the income per capita of the European Union (up to almost 84%). Only inflation and the balance of trade have shown an under-performance compared with the inflation rate in the Euro-zone: The average annual increase in the consumer price index since Spain joined the euro area has been 2.4%, over 1 percentage point higher than the price level increase in the area.

We strongly believe that an important part of the recent performance of the Spanish economy can be explained by the lower real interest rates, as a result of adopting the euro as the national currency. For example, real long-term interest rates in 1997 were 4.3% p.a., while

in 1999 they were down to 2.4%: a reduction of 2 percentage points. The lower interest rates have stimulated consumption and investment, to the point that construction has been an engine of growth. Secondly, lower interest rates and lower capital costs created a wealth effect as the shares prices of firms quoted in the Stock Market almost doubled due to the lower discount rate of current and future profits. Since this occurred during a period of privatisation of public monopolies and many families purchased shares of the privatised firms, the wealth effect has spread (unevenly) among millions of people.

The government deficit has been kept under control, also helped by the lower interest rates, even though income taxes were cut, a factor that increased internal consumption and raised imports substantially.

Long-term factors of growth

A closer look at the Spanish data on economic growth reveals that GDP and employment have both grown at high rates. This means that labour productivity grew at a relatively low rate during this period. Output grows because idle resources, especially labour, are put to work. Some analysts even question that a substantial part of this growth is “real”, since it would result from the normalisation of activities that until very recently were part of the underground economy. Since those activities are likely to be highly labour intensive, the true increase in labour productivity during this period is likely to have been higher than the increase obtained from the statistics on the evolution of GDP and employment. But there is a wide consensus among analysts of the Spanish economy on the fact that the potential contribution of the

information technologies to productivity growth has not yet materialised.

How and when the technological developments within the so-called “new economy” will penetrate the Spanish economy, is hard to know. However, one could expect that the absorptive capabilities of the country with respect to the deployment of these technologies will be positively related with the country’s endowment of human and technological capital. In fact, these two forms of



capital are a precondition for any product or process innovation, necessary to assure sustainable productivity growth. We now present some evidence on human capital and R & D activity in the Spanish economy.

Human capital

The most common indicator of human capital in an economy is the level of education achieved by its working population. In Spain, 70% of the population within the age interval of 25 to 64 years has completed *elementary school*; 13% of the population has a *secondary school education*, 5% has a *high education degree* from non-university institutions, and 13% has a *university degree*. These percentages indicate that, on average, the stock of human capital among the Spanish population is lower than in other European countries with a comparable productive structure. For example in Ireland the percentages are, respectively,

50, 28, 12 and 12%, and in France, 40, 41, 9 and 10%. The averages for the OECD countries are: 40% of the population has an elementary degree, 40% a secondary degree, 10% a higher education degree and 13% has a university degree. Spain is in the average in terms of people with a university degree, but above average in terms of people who have completed no other education besides elementary school.

The information on the stock can be completed with information on flows which tells us about the possible convergence trends across countries. The economic effort on education in Spain is slightly below OECD averages. Total private and public expenditures on education as a percentage of GDP was 5.2% in 1995, compared with the 5.3% average of OECD countries in the same year. The most important part of this percentage goes to elementary and secondary school, 4.1% (compared with average OECD of 3.8%), and the rest, 1.1% to university education or similar (1.5% average for the OECD).

If the expenditures on public and private education are weighted by the number of students, in the mid-nineties Spain spent USD 2,580 per student on primary education, USD 3,270 on secondary education and USD 4,944 on high education (university). These figures are less than half of the expenditures per student in Austria, USD 5,480, USD 7,100 and USD 7,943, respectively, and quite below the OECD averages of USD 3,310, USD 4,670 and USD 8,134. It is true that the differences tend to be reduced over time (for example in 1985 expenditures per student in higher education were 36% of such expenditures on average for the OECD countries while in 1995 they represented 60.8%), but they are still important and Spain

has a long way to go towards closing the gap.

The low expenditures on education in Spain, compared with other European and OECD countries, can be explained partly by a high number of students per teacher and a considerably lower remuneration of teachers and professors. In Spain the number of students per teacher in higher education is 17 (16 in the OECD average) and the salary of a university professor is USD 27,025 per year, much lower than the USD 56,917 in Belgium, USD 54,336 in Ireland and USD 44,404 in Italy, countries with an income per capita not very different from the income per capita of Spain. These indicators imply that the quality of education in Spain may be lower than in other comparable countries, as a professor has to deal with more students and the low salary is likely to be attractive only for those that do not have good opportunities in other economic activities.

In a period of technological and organisational change as the one in which we are now, the number of higher education students that graduate in Science and Technology, as well as the number of persons with such degrees in the total population, may make a difference when it comes to adopting and implementing such technologies. In this respect, in the mid-nineties, 21 out of 100 graduates in the year got a Science or Technology degree, quite below the 33% of Ireland and the 28% of the average OECD countries. These figures also explain that in the same period, the number of persons aged between 25 and 34 years with a Science and Technology degree was of 794 per 100,000 persons in Spain, 1,436 per 100,000 persons in Ireland and 831 per 100,000 persons in the whole OECD. The current estimated deficit of persons trained in ICT is 80,000.

R & D investment

The innovation capabilities of an economy are often measured in terms of the resources invested in research and development, together with the output, for example number of patents, that results from such investment.

Since the early sixties, when the first reliable official statistics appeared, the R & D expenditure of the Spanish economy increased steadily until 1992 when it reached 0.91% of our GDP. After that year, GDP grew at a higher rate than R & D expenditures, and the innovation effort declined until 1998 when the R & D effort had come back to 1991 figures.

If we consider the annual growth of the total R & D budget, during the period 1992 to 1998 this growth came to 1.63% every year, much lower than the 11.46% registered during the period 1985 to 1992. The decline in growth rates was less in the number of researchers, 4.67% growth in the period 1992 to 1998 compared with 9.95% growth in 1985 to 1992, which implies that during the recent years, the R & D expenditures per person employed in R & D activities has declined in real terms, both in the corporate sector and in the sector of public administration, with the exception of Universities where it has remained stable.

The comparison of the Spanish figures with those of other developed countries makes clear our relatively low endowment of technological capital. The R & D effort in the European Union was 1.83% of the GDP in 1997, also lower than the 1.92% figure in 1992, but twice the Spanish ratio. Both figures contrast sharply with those of the US where R & D expenditures represent 2.79% of the GDP in 1998 and grow annually at a rate of 5.48%, com-

pared with the 3.06% grow in the European Union as a whole. The average growth rate in the Spanish R & D budget during the period is barely higher than the European Union average, 3.47% compared with 3.06%. In terms of R & D expenditures per researcher the figures are 60% higher in the European Union and there is no catching-up trend.

The experience of certain countries is particularly revealing of the fact that Spain has not followed an effective strategy in R & D. In 1990, Spain and Ireland were both having an R & D effort of 0.85%; seven years later Ireland spent the equivalent of 1.41% of its GDP on R & D, while Spain was still at its 0.85% level. A closer look at the figures reveals that the relatively low effort on R & D activities in Spain and its stability over time is the result of the freeze of R & D activities executed in the public sector, together with the stagnation of R & D activities in the private sector (firms), besides the public incentives to stimulate private R & D expending.

Looking at research and development from the output side does not change the conclusions drawn from by looking at the input side. On the positive side we have the evidence that the share of Spanish scientific publications in the world's total publication went up from 1.6% in 1990 to 2.5% in 1995. Within the European Union, the Spanish share of scientific publication was 5.1% in 1990 and 6.8% in 1995. In the first half of the nineties, Spain was the 11th in the ranking of countries according to scientific publications, with a little over 2% of the total publications, compared to 35.8% for the USA



and 7.42% for Germany. Spain is among the 10 leading countries world-wide in the fields of Chemistry, Biology, Biomedicine and Mathematics. All these figures confirm that Spain does comparatively better in scientific research than could be predicted from the comparative figures on resources devoted to R & D. However, one should keep in mind that the gain in market share took place mostly during the period 1982 to 1991 when the R & D expenditures grew at very high rates and the starting share was particularly low. Second, when publications are adjusted for their impact on the scientific community, the importance of Spanish publications is clearly lower.

The reasonable figures in scientific research points towards applied research as the Achilles heel of the Spanish R & D activities. The Spanish economy is the fifth in size within the European Union, but in 1997, for example, the number of applications for patents by Spaniards represented only the 2.3% of total applications in the European Union. In Spain, the number of applications per 1 million of habitants was only 69, very far from the 653 applications from Germany or the 555 from Sweden. Moreover, the number of innovations from Spain are particularly low in technologies which are considered to have the highest potential for future development, electronics, computers and the Internet. Even in fields such as Chemistry or Biology where Spanish basic research is relatively strong, the number of patents is relatively low compared with the number of applications in the European Union as a whole. The patent applications in Electronics, Chemistry and Biology in Spain represent a little over the 14% of the total applications; in the European Union the percentage is around 22.

The low innovation activity of Spain explains the high technologic deficit of the country, as royalty payments are USD 1,000 million higher than the income from them.

The under-performance in innovation activity is explained by the relatively low research and development effort (0.9% of the GDP in Spain compared with almost 1.9% in the European Union) as well as by other institutional features. For example, the high proportion that military equipment represents in the R & D budget (almost 50%); the fact that the private sector executes less than 50% of the research and development (compared with 70% average in OECD countries); and the low percentage of firms performing regular R & D activities (less than 0.2%).

Looking into the future

Spain's income per capita is getting closer to the average income per capita of the European Union (real convergence) as over 400,000 persons are being added to the payroll every year. This has been possible because the country has still a relatively high unemployment rate, and a low participation rate (specially among women). Productivity growth, however, has been and it is now very low. It is our conjecture that the process of job creation has been possible thanks to the lower interest rates (nominal and real) paid by firms and consumers after the country joined the euro, and thanks to the very moderate wage increases during these recent years. If the Spanish unemployment rate converges to the average rate in the European Union, Spain's income per capita will be approximately 90% of the average income per capita of the European Union. To complete the process of real convergence it will be necessary to improve human and

technological capital endowments, now quite below European averages. This is particularly true if we take into account that factors contributing to short-term growth are reversing: Real interest rates are going up world-wide and labour costs are under pressure from trade unions given our currently high inflation rate (3.1% annual increase in consumer prices) and labour shortages that start to appear in some regions of the country. Not to mention the rising trends in energy (oil) prices.

At the present time, the education level of the Spanish population and the innovation capabilities of the Spanish firms are far below the relative importance of the country in terms of GDP or even in terms of GDP per capita. Spain sustains its production capacity in imported capital goods with incorporated technological advances, and in the management know-how transferred to the Spanish subsidiaries of foreign multinationals. Although there have been some examples in recent years of multinational activities by Spanish firms, it has to be taken into account that most of these firms were until shortly ago public or regulated monopolies, with a lot of slack resources and free cash-flows invested in buying business in Latin American countries. Growth by acquisitions (many cases paying unjustifiable prices), not by product or process innovations.

To gain share in the innovation activities world-wide, Spain will have to invest more resources in education and R&D, and expect that among the more educated population there will be the managerial talent necessary to assemble people, money and technology, and produce goods and services in sectors of high value added.

A very positive, but not totally unrealistic, scenario would be that a

new generation of young entrepreneurs much more educated than their parents, inherit and take control of the family firms. Since they have been to university they have the “language” to communicate with university researchers and collaborate in developing new technologies. The stock market provides these firms the complementary financial resources necessary to finance the productive and commercial investments required to expand to foreign markets. The returns from these investments will be reinvested in more technological activities. In other words, entrepreneurial culture and talent, skills to undertake collaborations between Universities and firms, efficient capital markets in risk absorption, are necessary ingredients for innovation and productivity growth.

There is a general agreement in that the US is very much ahead of Europe in entrepreneurial culture, flourishing University-firms relationships, venture capital institutions and capital markets development. If we add to this the fact that the US is more advanced than Europe in terms of markets integration and the level of effective competition and in the level of flexibility in labour relations, there are reasonable doubts that the spread of ICT in Europe will follow a similar path and it will have the same consequences as in the US. We believe that in order to properly calibrate the economic impact of ICT in Europe, and in general to properly evaluate the prospects of economic growth, it would be necessary to have a better knowledge of the interactions between institutions and growth, even in countries with high economic and social development.



Europe is far from being an integrated market. This is especially true in labour and in basic products and services such as energy and telecommunications. Spain, for example, it is having difficulties to introduce competition in electricity generation and gasoline distribution since the number of firms that can operate in these markets is very low, given the economies of scale and the size of the market. There are growing examples of mergers and take-over operations among European firms that are stopped by nationalistic interests (therefore there is no market for corporate control at the European level or it is very limited). There are reasons to believe that the dominant role of banks in the European economies may have been negative for the development of venture capital initiatives in Europe. There is no such thing as a European system of science and technology, in the sense of a network of interrelations between research centres, universities and industries. All this explains past patterns of growth and will continue to affect the growth rates in the future. It is important to advance in achieving as soon as possible a higher degree of economic integration among European countries, since then it will be possible to take better advantage of the enlargement of markets for goods and services made possible by the euro.

We therefore agree with the idea that to take full advantage of the

growth potential provided by the ICT, Europe has to undertake some institutional changes in the lines indicated above. But there is also evidence that suggests that Europe will have to invest more resources in critical activities of the “knowledge economy”, to catch-up with the USA. In particular, during the nineties, the expenditures in R & D in the European Union have growth at an average annual rate of 3.06%, compared with a growth rate of 5.48% in the USA and 4.04% in Japan. The R & D expenditures in Europe represent 1.83% of GDP, compared with 2.79% in the USA and 2.92% in Japan. Secondly, in 1995, the expenditures per university student in the USA were 11,684 euros, almost double the expenditures per university student in the European Union (6,434 euros). These figures should not be ignored when it comes to comparing growth records and prospects among the most developed areas of the world. ❧

References

- European Commission (1999).** Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions: Towards a European Research Area. Brussels.
- COTEC (1999).** Informe Cotec 1999: Tecnología e Innovación en España. Fundación Cotec. Madrid.
- OECD (1999).** Education at a Glance. Paris.



GERTRUDE TUMPEL-GUGERELL, MODERATION

CLAUS J. RAIDL

JOE ROONEY

ANDREAS TREICHL

STEFAN K. ZAPOTOCKY

JOSEF ZECHNER



Technologischer Wandel,
Aktienmärkte
und Firmenbewertung

Podiumsdiskussion

Challenges for economic policy from the perspective of a central bank¹⁾

Introduction

The possible emergence of a New Economy in the United States has aroused the interest of academics and policymakers. It is obvious why central bankers are interested in this topic: The correct assessment of whether an observed acceleration of



output growth will be transient or of a longer duration is crucial for the effective conduct of monetary policy. If uncertainty prevails, strategies relying on simple rules that are explicitly or implicitly based on estimates of the output gap are less appropriate.

The correct assessment of potential growth is one side of the story, understanding the driving forces behind growth the other. Finding suitable strategies to enhance the capacity of the European economy to generate high rates of noninflationary growth over a prolonged period is of crucial importance to safeguard social welfare. It is well understood that monetary policy may best contribute to achieving this goal by providing a low-inflation environment. We must further our knowledge about the determinants of growth and draw conclusions about the best mix of structural and

macroeconomic policies. What is also not very well understood is how social factors and institutions influence economic growth. Before discussing this point, I will elaborate on how the effectiveness of monetary policy is affected by higher uncertainty about potential growth.

Monetary policy rules and the new economy

In case a New Economy emerged, monetary policy is influenced in various ways. It is common knowledge that monetary policymakers are confronted with limitations on the information on which they base their policies. Having to design policies based on information that is at best incomplete is a special challenge in view of uncertainty about potential growth. The renewed interest in monetary policy rules (Gali and Gertler, 1999) has recently been complemented by studies considering monetary policy rules with uncertainty in general, and uncertainty with respect to potential growth specifically (Smets, 1998).

It is widely recognized that monetary policy rules, such as monetary targeting or inflation targeting, reduce the inflationary bias by directing expectations toward low inflation. Complying with rules that underpin credibility may be seen as a strong commitment to price stability. However, it has also been argued that monetary rules are superior to discretion only if the gains from dynamic consistency are higher than the loss of flexibility implied by a strict rule. A rule, it is argued,

¹ I wish to thank Helene Schuberth for valuable comments.

implies reduced flexibility, above all in the reaction to shocks. While the traditional literature on monetary policy rules assumes that the model of the economy is known, recent literature, based on Brainard (1967), shows that optimal policy in the presence of specific kinds of uncertainty differs significantly from that in a world of certainty. Accordingly, the optimal policy response in the presence of uncertainty cannot be determined per se but differs with respect to the various types of uncertainty (Srouf, 1999).

In the case of inflation targeting, model uncertainty of different kinds in most cases implies a more gradual adjustment of the conditional inflation forecast toward the inflation target.

One kind of uncertainty that has attracted a lot of attention is uncertainty about potential output growth. The different methods that are used to estimate potential output fall short of the underlying complex theoretical concepts. In particular, Orphanides (1999) has argued against monetary rules that are based on the estimation of the output gap: Real-time measurements of the output gap are flawed, since monetary policy cannot perfectly distinguish between cyclical and trend movements in output. Infrequent and sizable changes in the output trend will lead the monetary authority to systematically misinterpret the output gap and therefore to introduce an inflationary or disinflationary bias.

It should be noted, however, that uncertainty about whether the growth path of potential output has shifted upward makes monetary policymaking a difficult task, irrespective of whether the monetary policy rule relies on the output gap or not. The ongoing debate about whether in the 1990s the U.S. economy shifted towards an accelerated

growth path and whether the relationship between wages, prices and productivity changed fundamentally exemplifies policymakers' difficulties in relying on growth forecasts based on past structural relationships between macroeconomic variables.

Monetary policy and the New Economy

One line of reasoning explaining high noninflationary growth is based on the New Economy view. Its proponents state that the rapid growth of high-tech products has rendered obsolete previous capacity constraints associated with the Phillips curve, while globalization has provided low-tech products at low prices. Hence, high productivity growth is not a temporary cyclical, but a structural, long-lasting phenomenon. Conversely, Gordon (1999) argues that about a third of the productivity improvement since 1995 was due to measurement errors; a third to cyclical factors, and a third to productivity improvements in computer manufacturing. Outside computer manufacturing business, he found that productivity had actually fallen.

We may conclude that adherence to a strict monetary policy rule may be less appropriate if we consider uncertainty about potential growth. From this perspective, the Eurosystem's strategy is well suited to dealing with such uncertainty. The strategy rests on two pillars: First, money is given a prominent role by announcing a reference value for monetary growth M3. Prolonged deviations of current monetary growth from the reference value would, under normal circumstances, signal risks to price stability. Second,



risks to price stability are considered on the basis of a wide range of economic and financial variables. Unlike simple rules that rely on only a few variables, this second pillar of the strategy allows policymakers to base their decisions on the information content of many variables. Hence, the Eurosystem clearly decided against a strict rule. This is also expressed by the statement that “the concept of a reference value does not imply a commitment to mechanistically correct deviations over the short term.”

In a situation that is characterized by uncertainty about potential growth the federal structure of the Eurosystem can be seen as an advantage. The Eurosystem can benefit from the economic expertise of individual national central banks, which have a profound knowledge of their economies’ institutions, structures and data.

Fostering the growth potential in the European Union

Irrespective of whether a New Economy exists in the United States, we are well aware that Europe has to strengthen its growth potential. Over the last decade, the European Union has significantly fostered economic integration and has started to create a sound framework for the conduct of economic policies. However, the European Union lags behind the United States both in terms of innovative capacity, with the gap having increased since the mid-1990s, and in the production and spread of information and communication technologies. Based on the notion of some new growth models that capital should incorporate not only physical and human capital, but also the accumulation of knowledge, several initiatives have been taken at the Union

level to promote the transition to a knowledge-driven economy.

The policy recommendations comprise several measures to improve innovative capacity, such as adequate incentives to increase the involvement of the private sector in the financing of research and development expenditures, raising the level of competition in product and capital markets and ensuring public support for the funding of basic research.

There is now agreement at the political level that those recommendations should be part of a broader reform process envisaged in the area of product, capital and labor markets. Competition and well functioning financial markets are essential conditions for increased innovation and a better diffusion of technology. Though unemployment rates are now declining throughout the European Union, the implementation of structural reforms and of proactive measures aimed at increasing the low rates of employment, particularly among women and older working-age people, is still incomplete and unevenly distributed among European Union countries. There is agreement that labor market reforms are crucial to fully reap the benefits of a knowledge-driven economy. Less agreement can be found, however, about what type of measure should be taken to deregulate the labor market, and how these particular measures should look. Interestingly, the few countries that are subject to New Economy phenomena are endowed with different labor market structures. Whereas the U.S. economy, with its deregulated and flexible labor markets, is often cited as a model for Europe, it appears worthwhile to study the Finnish experience more thoroughly: In Finland, the information and technology sector began to grow in the

mid-1990s, with the consequence that employment and productivity increased. Like Austria, Finland is a country with a long-standing corporatist tradition, strong unions and labor representation, and centralized wage bargaining mechanisms (Ministry of Labour, 2000). Finland is an especially interesting example because it has succeeded in promoting the growth of the information technology sector and it has been able to take advantage of the effects for employment.

There seems to be no uniform “optimal” institutional framework condition for high and sustainable growth. The Finnish example shows that we should avoid too simplistic explanations of growth. Currently available growth models are increasingly being challenged by studies which highlight the very complex interaction between the social, political and institutional environment and economic growth.

Conclusions

In Europe, New Economy phenomena might rapidly emerge, even if no hard facts are observable yet: Information technologies are available worldwide and can be transferred easily. For monetary policy to be optimal, it is crucial to identify New Economy phenomena early. The monetary policy strategy of the Eurosystem is well suited to complying with this challenge: It safeguards low inflation and at the same time allows some degree of flexibility to react to technology-based shifts in permanent growth. The adequate interpretation of whether observed

output growth is of a permanent or transitory nature is one of the main challenges monetary policy is facing in an environment of uncertainty about potential growth.

Another concern for central banks is the fact that Europe’s innovative capacity is lagging behind that of the United States. Promising steps have been undertaken at the European Union level to promote the transition to a knowledge-driven economy, above all, steps toward enhancing education and human capital formation. Specifically, structural reforms of the labor markets are important to fully reap the benefits of those measures. 

References

- Brainard, W. (1967).** Uncertainty and the Effectiveness of Policy. In: *American Economic Review* 57, Papers and Proceedings, 411–425.
- Gali, J., Gertler, M. (1999).** Inflation Dynamics: A Structural Econometric Analysis. In: *Journal of Monetary Economics* 44 (2), 195–222.
- Gordon, R. (1999).** Has the “New Economy” Rendered the Productivity Slowdown Obsolete? Northwestern University and NBER, mimeo.
- Ministry of Labour (2000).** Finland’s National Action Plan for Employment, April.
- Orphanides, A. (1999).** The Quest for Prosperity without Inflation. In: Working Paper Series 93, Sveriges Riksbank.
- Srouf, G. (1999).** Inflation Targeting under Uncertainty. Bank of Canada, mimeo.
- Smets, F. (1998).** Output Gap Uncertainty: Does It Matter for the Taylor Rule? In: Working Paper No. 60, Bank for International Settlements.

Financial markets: technological changes, stock markets and the evaluation of firms

The topic I deal with implies various aspects:

1. Evaluation of firms – do we need a “new thinking” for valuing the “new economy”?
2. How do stock markets respond?
3. The effect on the individual stock exchanges.

lion this year and net assets of GBP 50 million. Hopes for the potential of its technology have carried Baltimore’s valuation from GBP 78 million at the start of last year to more than GBP 4 billion today”.

The similarities of today’s “Internet and IT companies” and the beginning of venture capitalism seem very obvious. In the early days of venture capitalism an entrepreneur had an idea and he tried to find investors to finance his ideas. If the original

idea proved to be successful and the investor could show a product (hardware, software, services etc.) he then tried to go public. In case that the idea did not materialise the investor lost his money. The profit for the investor was in most cases realised when the company – financed through venture capital – went public. In venture capitalism nobody ever tried to value these ideas – the question for the venture capitalist was not: “what would be the value of the company” (where he invested), the main question was “how much money does this investment need”. The venture capitalist had then to decide by himself “do I take the risk or don’t I?”. When one regards stock introductions and valuations of these Internet and IT companies, one gets the feeling that these stock introductions are venture capital on a large scale, namely on the stock exchange. In economic terms this would mean that the risk taking venture capitalist is substituted by



Evaluation of firms – do we need a “new thinking” for valuing the “new economy”

Financial Times, February 19, 2000: “Knock-down stocks:”

“Whitbread, the brewing, restaurant and leisure group, is one of Britain’s business giants. It has an annual turnover of nearly GBP 3 billion (USD 4.8 billion), pre-tax profits of GBP 366 million and assets of more than GBP 2.5 billion.

But Whitbread is in danger of dropping out of the FTSE 100 index of the UK’s largest companies when the components are next changed; even after a recovery in its share price late this week, its market capitalisation is close to the relegation zone.

One strong candidate to replace Whitbread will be Baltimore Technologies, a software group that has annualised turnover of GBP 21 million, an expected loss of GBP 20 mil-

shareholders, because nowadays you go to the stock market with ideas and not with products.

When some weeks ago amazon.com published the results of the previous period and at the same time had to admit that losses were higher than expected, the share price went up although even the announcement for the future said that there still would be losses but they could be reduced. With our classical methods for the valuation of companies one cannot explain this procedure. Obviously, we need a new approach to these valuations. This new way of thinking can mean that the main factor for the value of a company is:

- growth,
- human capital (how many Ivy League alumni),
- market position,
- level of losses,
- marketing expenses, and
- unique visitors and page hits (for e-business companies).

Therefore we may ask: Is the idea of making profit obsolete? I still believe that these new methods are only taken as an indication that in the long run a company with the above described position (growth, many Ivy League alumni, market position, level of losses, marketing expenses, unique visitors) will eventually make profit and that the investor will see dividends and has a chance to get his money back in cash when he sells his shares. We must not forget that at the end of the period (how ever long it may be) the investor (particularly the institutional investor) needs cash to pay a pension, to pay medical bills or to cover other expenses for his clients (for example insurance payments).

How do stock markets respond?

The answer to this question would be in short: The response of the stock market to these new companies and to these technological changes is irrational. This collective irrationality is nourished by the bonus system for investment bankers and by the stock options for the management (at least from a conservative point of view). On the other hand there are also good reasons for this approach:

- The capital market is the only global market. The commodity market is not a real global market yet. Both, the US and Japan have a trade share of only about 10% of GDP respectively. The countries of the European Monetary Union (11) have a slightly higher level of trade, the mark is around 12%, but if you count the United Kingdom (which is outside the EMU-countries) as a member, the figure would even be lower. This globalisation of the international capital market can channel enough money into these Internet and IT companies. Furthermore globalisation has increased the amount of capital looking for investments as a whole.
- When governments start producing budget surpluses (especially in Europe they are achieving it under the pressure of the Maastricht criterias) more money is available for new investments.
- The investment behaviour of the private sector in Europe will change as well. Private investors will buy more shares and funds invested in shares. When I take Austria as an example, the saving rate of the last five years was on the average around 9% p.a. (private saving rate defined as pri-

vate savings in percent of disposable personal incomes). The savings in absolute figures reach a level of around ATS 1,700 billion at the moment.

The message related to the second question is therefore: There is enough money around.

The effect on the individual stock exchanges

For the “new economy”, stock exchanges have only a chance when they have:

- a reputation for the “new economy”,
- enough liquidity for these high trading volumes and capital needs, and
- a sufficient number of domestic investors who need not take any currency risks or legal risks.

What does this mean for the Vienna Stock Exchange? The legal and organisational structure of the Vienna Stock Exchange is – after the reforms of the last two years – without any doubt on a high level compared to the other stock exchanges within the European Union. The introduction of the XETRA system (the link to the Deutsche Börse AG Frankfurt) helps to strengthen the position of the Vienna Stock Exchange. Further-

more Austria has a new take-over law which German does not have. In other countries take-over regulations are not stipulated by law but by some codes as can be seen in the case of the United Kingdom. Still the Vienna Stock Exchange suffers from some drawbacks: there is low liquidity, the lack of a domestic capital market and the lack of attractiveness for any special sector of the economy.

The Vienna Stock Exchange should either find a special niche (e.g. “old economy”, “new economy”, small caps, Eastern European shares etc.) or sooner or later will have to be fully merged with the Deutsche Börse AG Frankfurt.

One of the main problems for small companies in Austria is that the big investment bankers and the analysts have the tendency to stop coverage of a company when the stock exchange capitalisation is below USD 1.5 to 1 billion. Perhaps the Vienna Stock Exchange can offer analyst coverage for these smaller firms so that the attention of the institutional investors can be attracted. Such a strategy could be a niche policy for the Vienna Stock Exchange in order to encourage small- and medium-sized companies to be listed in Vienna. 

The ageing of the New Paradigm

The New Paradigm, as it applies to the global equity market, looks distinctly tired. The impact of information and communication technologies (ICTs) on equities falls into two distinct phases. In the first phase, running from the trough of the recession in the early 1990s through to around 1998, the effects of ICTs on those variables that influence equity prices were universally positive. In recent years, there have been clear signs of deterioration in those same variables. It would appear that the very success of the New Paradigm has sown the seeds of its current troubles. The focus of my comments is on how the fundamentals underpinning global equities have started to deteriorate, just as the level of speculative interest in equities was rising to its recent crescendo. Indeed, our sense is that events of the first half of the year 2000 will come to be seen as the turning point in the secular fortunes of this long equity cycle.

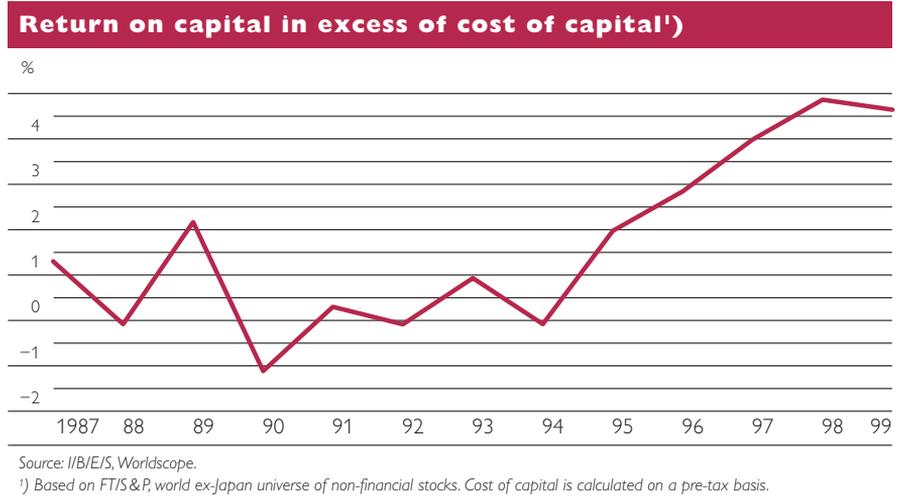
Below, we focus on a number of key variables, the very variables that drive our equity and asset allocation work, to illustrate the two phases of the equity market over the past 10 years. Much of our analysis is drawn from financial data covering the equity markets outside Japan (as given by the FT/S&P World Index). Japan's exclusion reflects a deficiency of data for that market, as well as the fact that Japan's economy has been operating on a different cycle from the rest of the world, through the course of the 1990s.

The mid to late 1990s was characterised by an improvement in corporate profitability as it applies to the investor (see figure 1). The return on capital employed in excess of the corporate sector's weighted average cost of capital rose continuously from the trough of the last recession through to 1998. Part of this improvement was a reflection of



the emergence of a very profitable quoted technology sector, and part was due to the beneficial impact on profitability that resulted from the application of ICTs to existing, or so-called "Old Economy" companies. In recent times, two not unrelated factors have started to weigh on profitability. The first factor is that the cost of capital, particularly the cost of debt capital to the corporate sector in the US, began to rise. (However, it is worth pointing out that through the last period of monetary tightening, in 1994 to 1995, the return on capital rose by more than enough to offset the rise in the cost of capital.) Second, the corporate sector is having to commit ever increasing amounts of capital to its businesses in order to compete within the New Paradigm. As recently as 1995 and 1996, the US non-financial sector was increasing its capital employed by 6% per annum. In 1999, the rate of growth had accelerated to 12%. Despite

Figure 1



the benefits of the strongest cyclical recovery in years, corporate profitability fell in 1999.

This deterioration in corporate profitability is mirrored in a decline in consensus estimates of the long-term growth rate for the corporate sector. Our measure of the long-term growth potential of the corporate sector is a profit-weighted aggregation of the consensus estimate of each company's earnings growth for the coming five years. To compensate for the trend towards disinflation through time, we have adjusted the nominal series for the current inflation rate (see figure 2). The expected rate of long-term growth, for the corporate sector, peaked in the middle of 1998 and

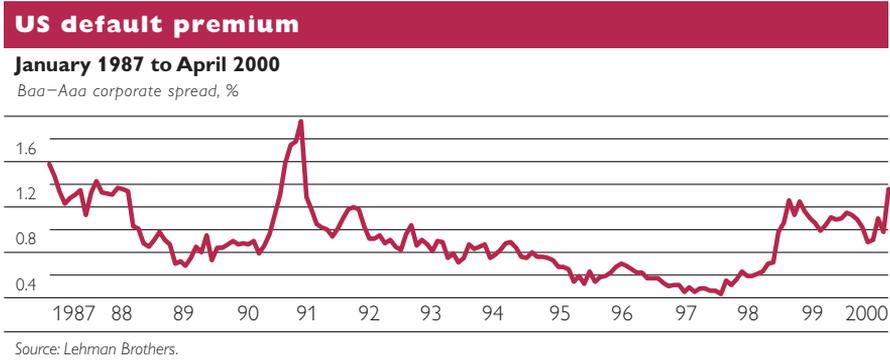
the current cyclical upswing, as strong as it undeniably is, has failed to lead to any improvement in long-term expectations for the corporate sector's earnings capability.

A key factor underpinning the upward trend since the early 1990s has been developments in the technology sector itself. The past eight years were characterised by the consensus consistently underestimating the long-term growth potential of the technology sector. That being said, recent estimates of the sector's long-term growth outlook are in line with the actual rate of growth achieved over the past eight years. Given the maturity of the technology sector's profit base in relation to where it was eight years ago, it is fair

Figure 2



Figure 3

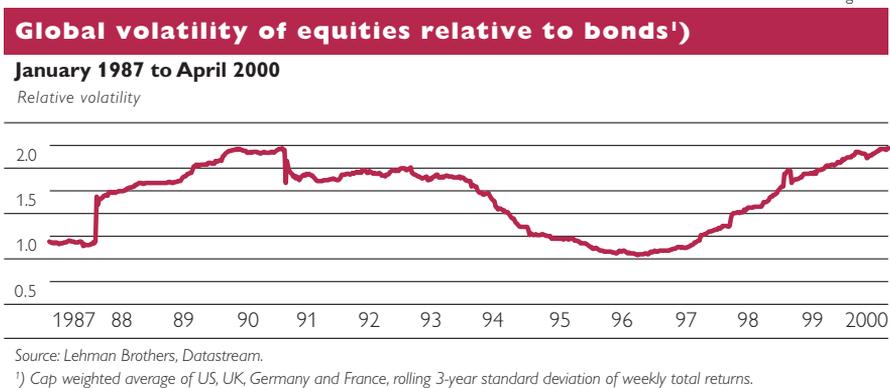


to assume that the future growth rate is unlikely to exceed that of the past for any sustained period. If we broadly accept this assumption while recognising the strength of the current economic upswing, it is fair to accept that secular rise in long-term corporate growth estimates peaked in 1998.

The corporate sector's increased appetite for capital has given rise to signs of stress in the capital markets. This is most visible in the US credit markets. One of the myths of the New Paradigm is that the building of the knowledge-based economy is not capital-intensive. Federal Reserve data for the US non-farm, non-financial corporate sector show the level of new funds raised in the capital markets running at just over 40% of internally generated funds in the four quarters to end-March 2000. Between 1988 and 1998, the

comparable figure was around 20%. In the past two quarters alone, this figure rose to 60%. Since the corporate sector has shown a strong preference for funding itself out of the credit markets, it is not surprising that the signs of stress should emerge there rather than in the equity market. The spread between Baa and Aaa credits recently widened to over 130 basis points, a level last seen when the recession and the S&L crisis weighed heavily on the US corporate sector (see figure 3). Since 1996, the credit quality trend, as given by the number of credit downgrades relative to upgrades, and the balance sheet structure, for the "Old Economy" sectors of the US market, have been deteriorating. Both of these trends stand in contrast to the experience of the early years of the New Paradigm and again it is noteworthy that through the last

Figure 4



round of Fed tightening credit spreads narrowed.

These signs of corporate stress have spilled over into the equity market, but to date they are to be found in the volatility of stock returns rather than in the level of market valuations. The trend volatility of global equities relative to debt, using a three-year, moving average of the standard deviation of weekly returns, has been on an upward trajectory for the past four years (see figure 4). Through the early stages of the ICT revolution, when productivity gains spurred higher expectant rates of corporate earnings growth and simultaneously dampened inflationary expectations, and when the structure of the corporate balance sheet was improving, equity returns became increasingly less volatile, relative to debt. In recent years, the trend level of relative volatility has regained the highs seen ahead of the last recession.

Relative stock volatility is the critical factor driving the valuation of equities, relative to debt. The lower the relative volatility on equities, the more willing investors are to accept higher equity valuations for a given discount rate: or, in other words, to accept a lower risk premium on equities. The above trend implies that the valuation on equities should become more attractive in

order to induce the marginal investor to shoulder the additional uncertainty, implied by the relative volatility between these two asset classes. However, that is not the case.

Our favoured measure of value for global equities is the earnings yield gap, as shown in figure 5. It is simply the difference between the forward earning yield on equities, or the reciprocal of the price earnings multiple based on the expected level of corporate earnings over the coming 12 months, and the relevant bond yield. For the so-called Anglo-Saxon economies, we use the 10-year swap rate as the relevant discount rate. One effect of the rising level of corporate yields and swap rates has been to raise the discount rate used for valuing equities. Insofar as equity valuations are looking more stretched than they have been at any time since 1987, the implication must be that the current level of equity markets is not consistent with the deterioration in the fundamentals seen in recent years.

We can interpret our valuation framework in another way. Each vertical bar, in the second of our valuation charts (see figure 6), tells us how equities performed, relative to debt, over the six months following any point on the earnings yield gap. By thus establishing a good correlation between this measure of value

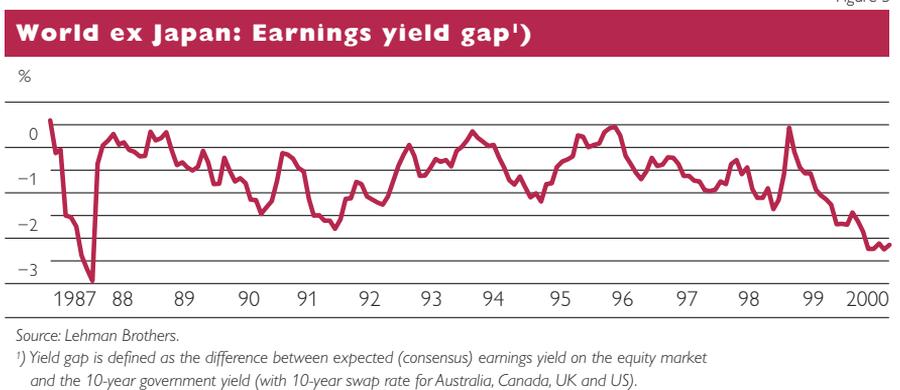
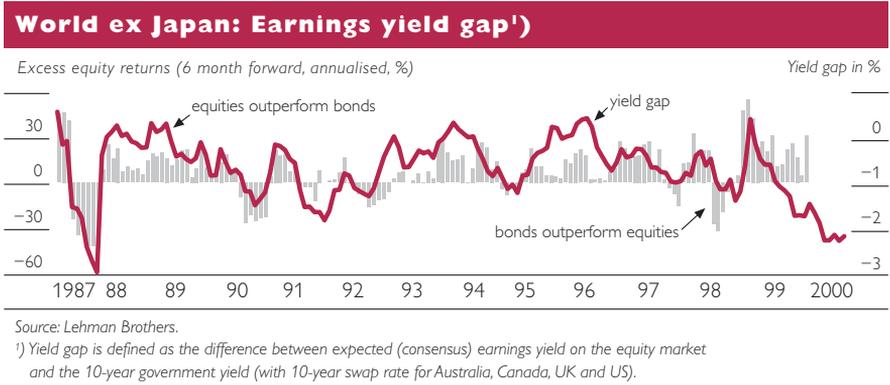


Figure 6



and the subsequent relative performance of equities, an obvious question emerges: Why has this relationship broken down in recent quarters? We would attribute the breakdown in this relationship to the increasing level of speculation in global equity markets.

The record level of inflows into equity mutual funds is of interest in itself, but it does not tell the full story. In figure 7, we show the inflow of money into equity mutual funds, deflated by the size of the global equity market, together with the year-on-year change in the OECD's leading indicator for global economic activity. The recent flows into equity mutual funds have exceeded previous cyclical peaks in demand. But of greater significance has been invest-

ors' appetite for growth. In our view, the unprecedented level of demand for technology and telecom stocks has been such as to distort the traditional pricing of risk within global equity markets.

In the past, it was typical for some 40% of all retail flows into domestic equity and bond funds to be directed at growth-oriented stocks (see figure 8). By the end of last year, the appetite for growth stocks was such that it could only be funded by the sale of non-growth-oriented equity funds and bond funds. By January 2000, the flow into domestic growth funds had reached nearly 350% of inflows into total domestic equity and bond funds: the polar opposite of the flight to safety that charac-

Figure 7

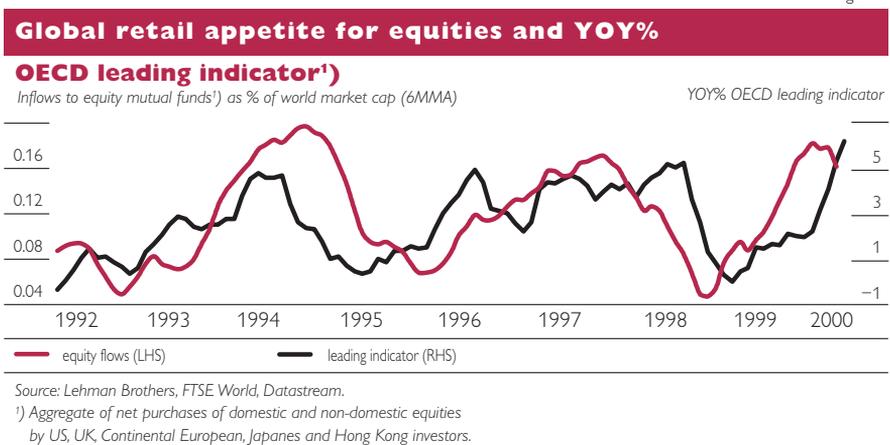
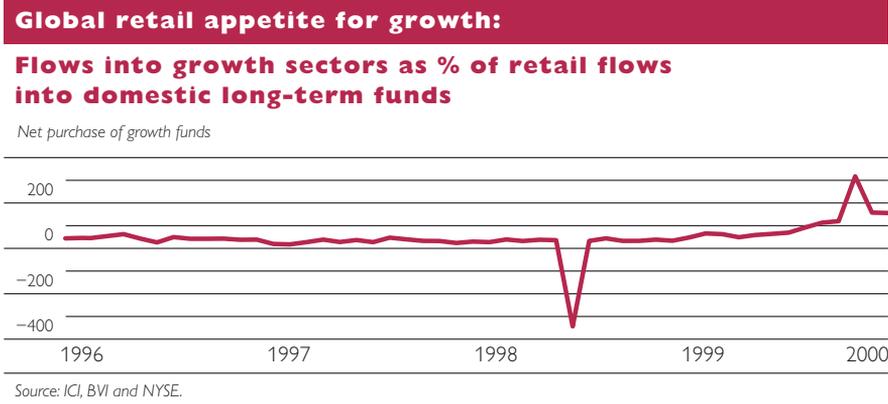


Figure 8



terised the Russian debacle of 1998.

If we add to these inflows the monthly net change in margin debt, the picture, as we show in figure 9, becomes even more extreme. In the US, the flows into growth stocks, as given by the change in margin debt and the purchase of domestic growth orientated mutual funds, in the first quarter of the current year, ran at an annualised USD 750 billion, i.e., some 11% of disposable income. Yet even this figure is an understatement

of the true appetite for growth stocks, as we have no way of calculating what individuals were doing with their own, non-leveraged positions. (By way of illustration, we know the above figures ignore the flows into overseas equity funds, which are a risky asset class. Were these to be included, the figure rises to 13.2% of US disposable income.) These flows are startling in their size and, in our view, they have distorted the pricing of risk in global equity markets.

Figure 9

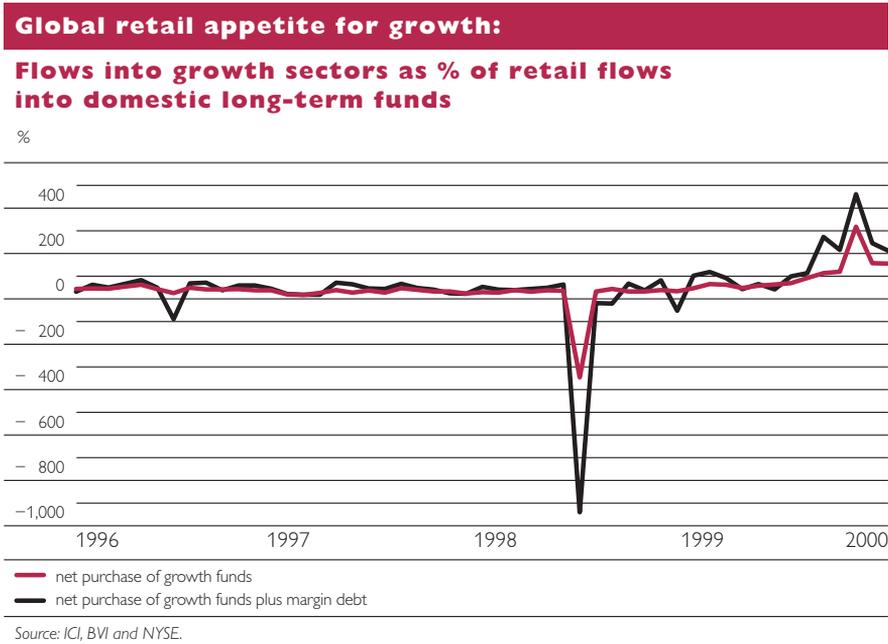
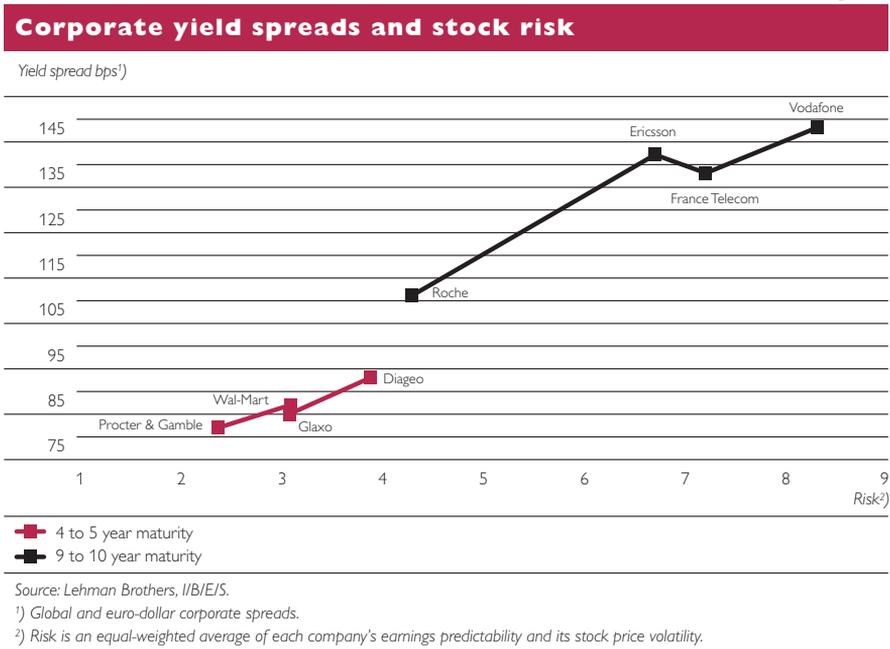


Figure 10



To illustrate the mispricing of risk, we looked at a number of companies with liquid debt instruments of comparable maturity and coupons. We show how the credit markets priced the risk of the companies, where we have used, deliberately, an equity-oriented measure of risk (see figure 10). The basic principle of capital asset pricing holds, in that investors are compen-

sated for taking on risk, with the yield spread over the benchmark rising with the greater levels of corporate risk.

Yet by March 2000, the equity ratings for these same companies show the relationship between valuations and risk had been reversed. (For the equity rating in figure 11, we use the ratio of the trailing price earnings multiple to the expected

Figure 11

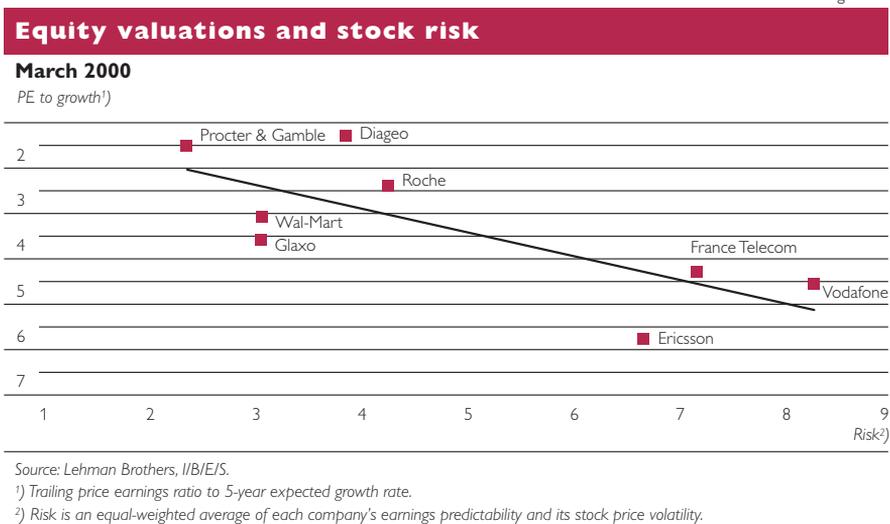
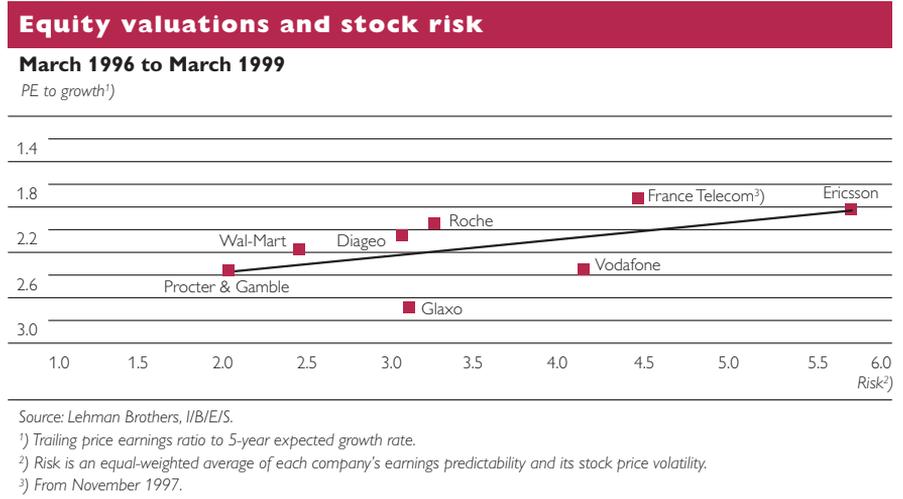


Figure 12



long-term growth rate. This allows us to take into account the different growth rates across companies.) To test that there is not a permanent disconnect between the equity and credit markets, we looked at the same equity rating to risk relationship, for the same stocks, based on data for the previous three years (see figure 12).

It is to be expected that the end of a long bull market in equities should be signalled by a rise in speculative activity. Yet this speculative activity has pushed equity valuations to levels which, in our view, are increasingly at odds with the deterioration in the market fundamentals. The process of adjustment is under way, but it has further to go. 🐘

An der Schwelle zum nächsten Jahrtausend geht ein technologischer Wandel vor sich, der Strukturen aufbricht, Arbeitsplätze einspart, gleichzeitig aber auch Tausende neue Stellen schafft und Jungunternehmen Chancen bietet wie schon lange nicht mehr. Der technologische Wandel hat einen dramatischen Umwälzungsprozess in der Wirtschaft in Gang gesetzt, der an andere bedeutende Erfindungen erinnert. Immer wieder hat es in der Geschichte Unternehmen gegeben, die im Mittelpunkt des Interesses von Investoren standen. Früher kontrollierten die wichtigsten Industriezweige die Morgans und Rockefellers. Heute sind es Visionäre wie Gates, Allen¹⁾ oder Ellison²⁾, welche das enorme Potenzial der neuen Technologien vorzeitig erkannt haben.

Hohe Erwartungen schaffen meist auch hohe Börsenurse. So hat der Nasdaq 100 Index seit 1998 über 180% an Wert zulegen können, während der industriellastige Dow Jones Industrial Index im Vergleichszeitraum 38% steigen konnte. Noch eindrucksvoller ist derselbe Vergleich in Deutschland. Hier kletterte der Neue Markt Index um 550%, während der DAX seit Jänner 1998 um „nur“ 56% stieg. Diese Entwicklung wurde durch historisch tiefe Zinsen und einen weltweit hohen Überschuss an Liquidität unterstützt. Da Blue Chips in den meisten großen Portefeuilles ausreichend vorhanden sind und kursmäßig als ausgereizt gelten, suchen Anleger nach Branchen und Gesellschaften mit besseren Wachstumsperspektiven. Enorme Wachstumsaussichten rechtfertigen diese Anstiege teilweise. Während beispielsweise vor 5 Jahren nur etwa 1% der US-Haushalte online waren, sind es derzeit rund

30% (50 Mio). Diese Zahl soll auf rund 96% (160 Mio) im Jahr 2003 anwachsen.

Doch sind fulminante Wachstumsperspektiven wirklich gerechtfertigt? Worin liegen die bedeutenden Veränderungen der letzten Zeit?

Die Technologie hat sich einmal mehr weiter entwickelt. Durch das Internet bekommt das Gut Information einen noch höheren Stellenwert, auch die Informationsgeschwindigkeit hat noch zusätzlich an Bedeutung gewonnen. Wirkte



sich der technologische Wandel zunächst nur auf High-Tech-Aktien aus, so beflügelt er jetzt die komplette Wirtschaft. Denn jeder Betrieb verarbeitet Wissen bzw. Information. Durch die Errungenschaften im IT- und Telekommunikationsbereich geschieht dies jetzt rascher und effizienter. Betrachtet man zum Beispiel den Automobilsektor näher, so erkennt man, dass sich Entwicklungszeiten neuer Fahrzeuge deutlich verkürzt haben. Dies ist auf die Verwendung leistungstärkerer Rechner zurückzuführen, auch eine Just-in-time-Fertigung wäre ohne den Fortschritt in der Informationstechnologie nicht zu realisieren.

Es profitiert also auch die Old Economy von den Errungenschaften im IT- und Telekommunikationsbereich der letzten Jahre, und es wird immer schwieriger, die Old

1 Paul Allen ist neben Bill Gates der Co-Gründer der Firma Microsoft.

2 Lawrence Joseph Ellison ist der Gründer der Firma Oracle, heute CEO.

Economy von der New Economy zu unterscheiden. Oft reichte für einen Kursanstieg auch nur die Nachricht, dass eine „traditionelle“ Firma plant, in die New Economy zu investieren.

Die wichtigsten Vorteile für die Old Economy sind:

- Durch die Verwendung neuer Technologien kann effizienter gearbeitet werden.
- Den Unternehmen steht eine neue wirkungsvolle Vertriebsform zur Verfügung.
- Generell steht ein neues effektives Medium zur Verfügung.
- Die Transaktionskosten werden drastisch günstiger.
- Es entsteht zusätzliche Nachfrage durch den Aufbau zahlreicher neuer Unternehmen.
- Es bestehen attraktive Allianzen zwischen den neuen und alten Sektoren (vgl. Time Warner und AOL).

Der größte Kostenvorteil für die Firmen liegt jedoch im B2B-Bereich. (Dieser liegt technisch weit vor dem B2C-Bereich, aber mittelfristig wird sich auch der Markt für den Konsumenten weiterentwickeln.) Früher mussten die Konzerne jeden einzelnen Lieferanten anschreiben, heute hat der Käufer die Möglichkeit, sich über Communities in Sekundärbruchteilen die verschiedensten Angebote vom gesamten Markt einzuholen. Der potenzielle Abnehmer wendet sich in Einkaufsportalen direkt an den Hersteller, wodurch Zeit und Administrationsaufwand eingespart werden. Den Höhepunkt hat der Markt vorläufig in Internet-Auktionen gefunden, wo die einzelnen Waren an den Bestbieter versteigert oder die Aufträge an den Billigstbieter vergeben werden. Durch diese Verkürzung der Supply Chain verliert der Zwischenhändler seine Berechtigung im Markt. Unternehmensberater gehen davon aus, dass das Einsparungspotenzial für

die Old Economy in Summe bis zu 20% beträgt. Hat der Käufer sich für einen Lieferanten entschieden, kann er neben umfangreichen Statistiken auch Daten wie Lagerbestand und Lieferstatus online abfragen.

Während die Einkäufer jubeln, bereitet dies den Zulieferern Bauchschmerzen. Diese sehen sich auf den großen Beschaffungsportalen einem immensen Preisdruck ausgesetzt. Natürlich werden nach wie vor Qualitäten wie Zuverlässigkeit und Kompetenz eine Rolle spielen. Die Margen werden aber auf jeden Fall stark zurückgehen, und der Kunde wird auf Grund der Vergleichsmöglichkeiten schneller den Anbieter wechseln als zuvor. Doch auch der Verkäufer profitiert durch das Internet, denn der Informationsfluss funktioniert natürlich nicht nur in eine Richtung, auch der Unternehmer ist wesentlich besser über seine Kunden informiert und kann zielgruppenspezifischer agieren. Alle Veränderungen bedeuten in letzter Konsequenz, dass die Märkte viel transparenter werden und der Preis ein noch bedeutenderer Faktor wird. Damit nähern wir uns in großen Schritten dem „perfekten Markt“, der bislang ausschließlich im Lehrbuch existierte.

Da das Internet zahlreiche Vorteile für beide Handelspartner darstellt, übertrumpfen sich die Unternehmensberatungen und Marktforschungsinstitute in ihren Aussagen, wieviel Geld die Konsumenten im Internet ausgeben werden. Die riesigen Beschaffungsvolumina der Großkonzerne in den Brancheneinkaufsportalen tragen ihres dazu bei.

Es ist zweifelsohne richtig, dass der technologische Wandel die gesamte Wirtschaft revolutionieren wird. Die enormen Kursanstiege der letzten Monate sind dadurch jedoch nur bedingt zu rechtfertigen.

Auch die großen Indizes haben dem Wachstum der Technologietitel Rechnung getragen. Kamen 1995 nur 9,9% aller Eurostoxx-Aktien¹⁾ aus den Bereichen Telekom und Technologie, waren es 1999 schon 33,6%²⁾. Die Performance der Indizes wurde also zu einem großen Teil von der New Economy getragen. Im letzten Jahr waren Wachstumswerte zu 14% der durchschnittlichen Unternehmensgewinne verantwortlich, 2001 werden es schon 16% sein.

Wie wir in den vergangenen Wochen gesehen haben, können Technologieaktien auf kurze Sicht sehr volatil sein, doch auf Sicht von 10 bis 20 Jahren werden sie der Schlüssel für gute Performance sein.

Man ist gut beraten, das Angebot an High-Tech-Aktien – besonders der Internet-Firmen – differenziert zu betrachten, da es nicht gerecht wäre, alle IT-verwandten Aktien in einen Topf zu werfen. Auf der einen Seite gibt es Firmen, die in diesem Bereich hoch profitabel sind (wie Cisco, 3com oder Check Point Technologies). Dann gibt es Firmen, die über gute Ideen verfügen, wo es aber einfach eine Zeit lang dauern wird, bis sich das Unternehmen rechnet. Zu guter Letzt gibt es Firmen, die nur auf den Internet-Zug aufspringen, weil es zeitweise den Anschein hat, dass alles gekauft wird, wenn nur ein „e-“ vor oder ein „dot-com“ hinter dem Namen steht. Es wird die Aufgabe guter Analysten sein, einzelne Gruppen voneinander zu trennen.

Es ist eine große Herausforderung, aus dem riesigen Angebot jene Aktien herauszufinden, die in Zukunft überdurchschnittliche Erträge erwirtschaften werden. Grundsätzlich sind Informationen als Output

schwieriger zu bewerten und zu vermitteln als herkömmliche Waren. Kenne ich bei Waren den Rohstoffpreis und kann ungefähr die Fertigungsdauer oder den Fertigungsaufwand abschätzen, ist dies bei Informationen schon wesentlich schwieriger. Fest steht, dass Informationen inflationär sind. Waren sie früher ein teures Gut, sind sie heute beinahe für alle zugänglich. Den Wettbewerbsvorteil hat der, der sich die für ihn entscheidende Information aus dem riesigen Angebot herausfiltern kann.

Die Internet-Branche lebt von Information. Sie kommt in allen Schattierungen vor. Sei es in Form von Daten-, Software-, Medien-, Bild-, Musik- oder Filmanbietern. Speziell die Software lässt einen breiten Raum für Spekulationen offen. Ist eine Software einmal entwickelt, kann sie beliebig oft – nahezu ohne zusätzliche Kosten – kopiert und mit entsprechenden Marktanstrengungen auch verkauft werden, sofern der Markt sich vom Produkt überzeugen lässt. Gelingt das Etablieren gegen die Konkurrenz, muss das Programm nur laufend an die Anforderungen des Marktes oder an neue Computerbetriebssysteme angepasst werden. Herkömmliche Kosten für Lagerhaltung fallen heute noch in geringem Maße und in Zukunft – wenn die Software über das Internet vertrieben wird – gar nicht mehr an.

Es erschwert die Unternehmensbewertung, dass zahlreiche Firmen noch keine schwarzen Zahlen schreiben. Aus diesem Grund können herkömmliche Bewertungszahlen wie PE und ROE nicht herangezogen



¹ Dow Jones Europe Stoxx 50.

² Nach Marktkapitalisierung.

gen werden. Also werden vom Gewinn unabhängige Kennzahlen wie Sales Growth, Price/Sales oder Price/Book verwendet. Weiteres Augenmerk gilt wie gewohnt der Verschuldung und der Lagerumschlagshäufigkeit. Besonders bedeutend sind bei schnelllebigen Technologien die Ausgaben für R & D. Der Unternehmenserfolg hängt immer stärker vom Innovationsgeist und Know-how der Mitarbeiter ab. Um zu beurteilen, wie effizient das R & D-Budget eingesetzt



wird, wird untersucht, welcher Teil des Umsatzes auf Produkte entfällt, die in den letzten Monaten entwickelt wurden.

Findet man hiermit nicht das Auslangen, verwendet man neu entwickelte Bewertungszahlen, die helfen, das Potenzial der Unternehmen zu bewerten. Hier haben sich zum Beispiel „page impressions“ (wie oft wird eine Seite aufgerufen), „unique users“ (misst die Anzahl der Besucher pro Web-Seite) und die Verweildauer auf den jeweiligen Web-Pages durchgesetzt. Bei diesen Kennzahlen wurde eigentlich nichts anderes gemacht, als schon Bewährtes für neue Wirtschaftsbereiche abgewandelt. Es werden lediglich verlässliche Größen zueinander in Beziehung gesetzt, und diese werden dann mit der jeweiligen Peer Group verglichen.

Man darf nicht vergessen, dass solche Hypes – wie momentan im IT-Bereich – in der Finanzwelt nicht ewig Bestand haben. Denken wir nur zurück an den Biotech-Boom oder an die Japan-Hausse. Manche der „hochgejubelten“ IT-Unternehmen werden sang- und klanglos untergehen – spätestens dann, wenn die Realität zeigt, dass die vor dem Börsegang verbreiteten Ertragsprojektionen nur Wunschdenken waren. Andere wiederum werden von größeren aufgekauft werden, sodass wir in der kommenden Zeit zahlreiche Akquisitionen sehen werden. Einige werden ihre hohe Aktienbewertung für Unternehmenskäufe einsetzen, dies wäre mit baren Mitteln nie möglich gewesen!

Fest steht, dass der technologische Wandel der letzten Jahre die Weltwirtschaft nachhaltig beflügeln wird. Wie sich IT-Unternehmen in der absehbaren Restrukturierung der Branche halten werden, ist aus heutiger Sicht schwer zu beurteilen. Sicher ist, dass nicht alle Marktteilnehmer überleben werden. Eine Differenzierung zwischen Unternehmen, die forschen und entwickeln, Werte schaffen und eine Marktstellung erlangt haben, und denen, die bislang nicht mehr als Hoffnung erzeugten, deren Börsewert sich aber wohl gerade deshalb weit von den fundamentalen Faktoren abgehoben hat, ist unabdingbar. ❧

Zur Positionierung der Wiener Börse AG im Neuemissionsgeschäft

Eine der wesentlichsten Herausforderungen und Aufgabenstellungen für eine effizient tätige Wertpapierbörse ist – neben der möglichst kostengünstigen Einrichtung und permanenten Gewährleistung der *Wertpapier-Handelsfunktionen* und der Wahrnehmung einer umfassenden *Informationsfunktion* bezüglich relevanter Marktdaten – die Gestaltung und laufende Weiterentwicklung der *Emissionsfunktion*; dies im Sinne der Gewährleistung entsprechender Rahmenbedingungen für die Beschaffung von Eigen- und Fremdkapital der an dieser jeweiligen Börse geleisteten Unternehmen als Emittenten derartiger Kapitalinstrumente.

Der wesentliche Beitrag effizienter Börsen – gerade in Bezug auf Eigenkapitalemissionen – ist es, durch ein liquides, transparentes Handelssystem jederzeit eine faire Marktpreisbildung und damit eine aktuelle Bewertung zu ermöglichen.

Für die Wiener Börse AG (WBAG) – als Finanzserviceunternehmung und Handelsplattform des österreichischen Kapitalmarktes – lässt sich dazu Folgendes feststellen:

Die Reformschritte der letzten drei Jahre mit der Integration von Kassa- und Terminmarkt in eine privatwirtschaftlich orientierte und vollständig privatisierte neue Börsengesellschaft mündeten zuletzt in den Anschluss des heimischen Kassamarktes an das XETRA-Handelssystem der Deutschen Börse. Dieser Schritt wurde insbesondere mit dem Ziel gesetzt, den auf dem österreichischen Markt vertretenen *Emittenten* den Zugang zum – ge-

messen an der am Handelssystem beteiligten Anzahl und Qualität der hier angeschlossenen internationalen Handelsteilnehmer – sicherlich leistungsfähigsten Börsesystem Europas zu verschaffen und damit die Liquidität des heimischen Marktes möglichst rasch zu verbessern.

Die jüngsten Vorhaben, auch die geplante Börse IX – als Fusion des Londoner und Frankfurter Börseplatzes – auf XETRA-Basis zu etablieren, bekräftigen die Richtigkeit dieser Maßnahmen, wenngleich – nach der nun erfolgten reibungslosen technischen Implementierung – mit einer intensivierten Aufnahme der Handelstätigkeit durch die für heuer zu erwartenden 30 bis 40 zusätzlichen internationalen neuen Handelsteilnehmer erst ab der zweiten Jahreshälfte zu rechnen ist.

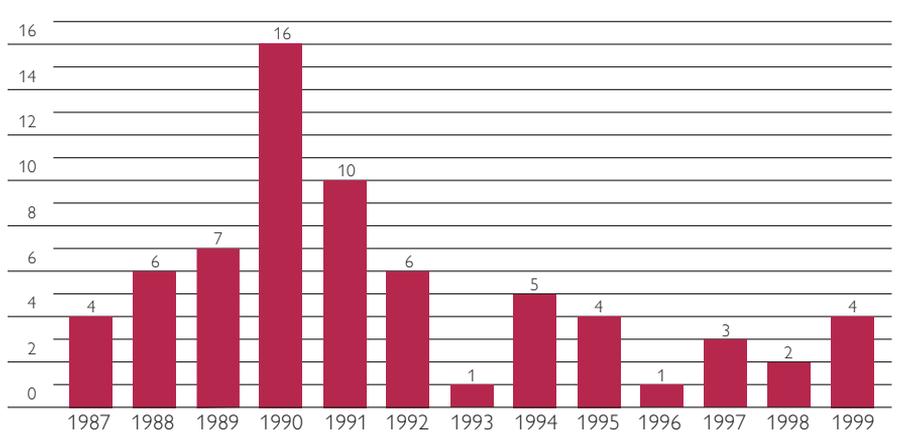
Die nach außen gerichteten Informationssysteme der Wiener Börse AG wurden ab Juni 1999 gezielt und so umfassend wie möglich in einer neuen Internet-Homepage zusammengefasst. Diese ist mit monatlich bis zu rund 1,8 Mio Aufrufen schon jetzt eines der wichtigsten Informationsmedien für den österreichischen Kapitalmarkt geworden. Auch hier wird an einer laufenden Verbesserung der abrufbaren Daten – wie Kurse oder Indizes und Unternehmensinformationen – sowie an einer weiteren optimierten zeitlichen Verfügbarkeit gearbeitet.

Zur dritten Hauptfunktion – der Emissionstätigkeit an der Wiener



Börsegänge in Österreich von 1987 bis 1999¹⁾

Anzahl



Quelle: Wiener Börse AG.

¹⁾ Nicht berücksichtigt wurden Umreibungen, Neuzulassungen nach Fusionen, Verschmelzungen und Abspaltungen sowie Listings verschiedener Wertpapierkategorien eines Unternehmens.

Börse AG – möchte ich zunächst die Entwicklung der Aktienemissionen im Bereich der Neueinführung der Jahre 1987 bis 1999 betrachten.

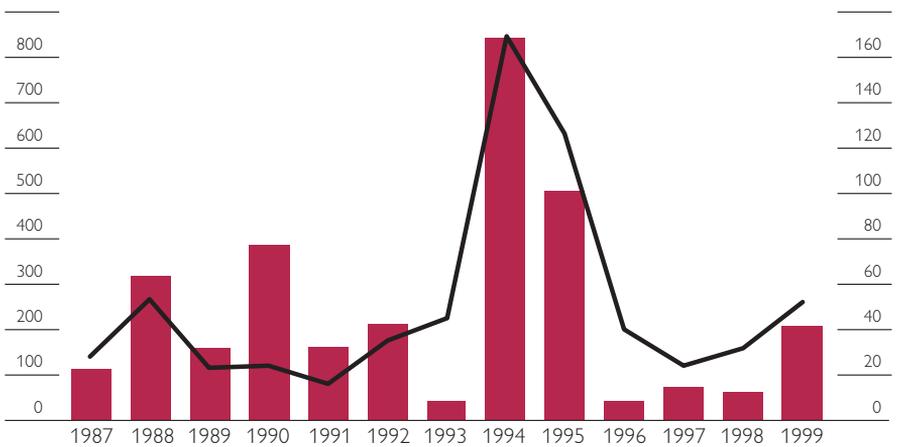
Wenn auch zahlreiche Emissionsprojekte – gerade auch die bisherigen Privatisierungstransaktionen der ÖIAG – als maßgeschneiderte Erfolge zu werten sind, so liegt dem österreichischen Aktienmarkt

mit einer aktuellen Gesamtkapitalisierung von rund 30 Mrd EUR – das entspricht nur rund 17% des BNP – weit hinter jedem anderen westeuropäischen Markt, wo im Schnitt über 50 bis 60% Anteil am BNP erzielt werden. Die jahrzehntelang zurückliegenden Ursachen für diese unbefriedigende Entwicklung sind gerade diesem geschätzten

Platziertes Volumen bei Neueinführungen

in Mio EUR

in Mio EUR



■ Platziertes Volumen der Börsegänge
 — Durchschnittlich platziertes Volumen pro Unternehmen

Quelle: Wiener Börse AG.

Nachhaltige Steigerung von Umsatz/Kapitalisierung



Auditorium bestens bekannt und sollen hier auch nicht weiter rückblickend analysiert werden.

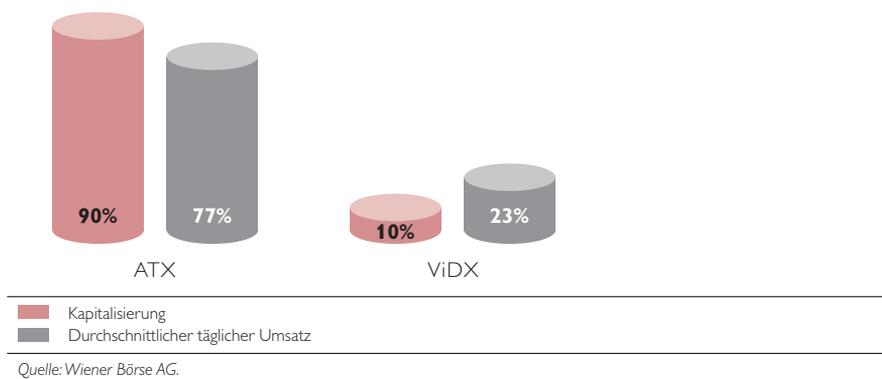
Die neue Wiener Börse AG hat sich jedenfalls im Dienste ihrer Aktionäre und als Kapitalmarktplattform für den gesamten österreichischen Markt zum Ziel gesetzt, zukünftig verstärkt für die Eigenkapitalbeschaffung der hier geführten Unternehmung bestmöglich zur Verfügung zu stehen und damit wieder zu einem starken Rückgrat für die gesamte Wirtschaft zu werden. Wir wollen seitens des Vorstands der WBAG mit unserem Team und allen engagierten Marktteilnehmern alles unternehmen, um innerhalb

der nächsten 2 bis 3 Jahre jedenfalls eine signifikante Erhöhung des Umsatzes (von täglich < 100 auf 250 bis 300 Mio EUR) und der Kapitalisierung (von derzeit 30 auf 50 bis 60 Mrd EUR) zu erzielen.

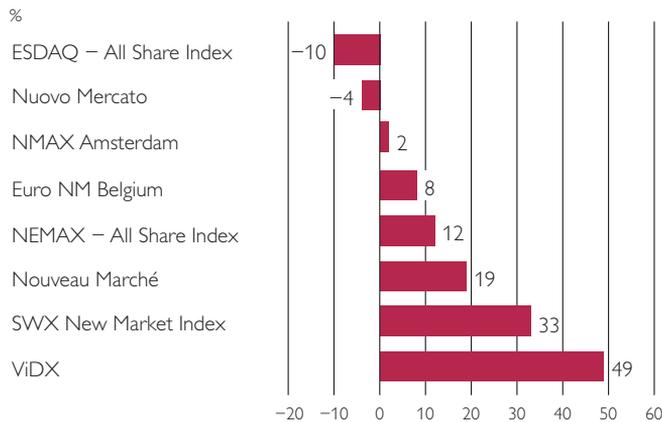
Wir sind überzeugt, dass mit der kommenden endgültigen Etablierung der europäischen Währungsunion die notwendige internationale Ausrichtung der österreichischen Unternehmen und damit auch eine – internationalen Wachstumserfordernissen gerecht werdende – Eigenkapitalpolitik umzusetzen sind.

Bisherige Möglichkeiten der Innenfinanzierung oder Eigenkapitalzuführung durch einen oder wenige

ATX, ViDX – Kapitalisierung und Umsatz



Vergleich der Performance europäischer Wachstumsindizes von Jänner bis Mai 2000



Quelle: Wiener Börse AG.

Hauptaktionäre werden tendenziell nicht mehr ausreichen, das erforderliche Wachstum zu finanzieren. Diese Tendenz wird durch die innovativen Unternehmensformen der so genannten New Economy und dem damit einhergehenden raschen Strukturwandel unserer Wirtschaft noch beschleunigt werden. Eigenkapitalbeschaffung über Börseninstrumente wird damit für viele erfolgreich wachsende Unternehmen zu einer absoluten Notwendigkeit.

Das heurige Jahr steht für uns im Zeichen der für den Herbst erwarteten neuen Privatisierungswelle der ÖIAG-Unternehmen und den verstärkten Börsengängen junger Wachstumsunternehmen. Gerade für dieses Marktsegment hat die Wiener Börse AG im Mai dieses Jahres bekanntlich einen neuen Index – den Vienna Dynamic Index (ViDX) – geschaffen. Dieser aus derzeit 10 wachstumsstarken bzw. innovationsorientierten Unternehmen umfasst rund 25% des Marktkapitals und rund 10% der Kapitalisierung der österreichischen Fließhandelswerte.

Gerechnet ab Jänner 2000 weist dieser heimische „Neue-Markt-Index“ eine Performance von höchstens 100 und derzeit YTD 52% auf.

Er liegt damit klar vor anderen vergleichbaren New-Economy-Indizes und stellt damit eindrucksvoll unter Beweis, dass der österreichische Kapitalmarkt mindestens ebenso attraktive Neuemissionen bringt wie andere international etablierte Märkte.

Wir sind überzeugt, dass unser Markt – bei entsprechend vorbereiteten Transaktionen – den heimischen Unternehmen eine wesentlich höhere Visibilität und Publizität ermöglicht als der Gang an Börseplätze mit einigen hundert anderen konkurrierenden Projekten.

Ähnlich wie bei unserem Hauptindex ATX wird die Aufnahme in den ViDX von einem aus Vertretern der Bankwirtschaft, der Großinvestoren, der Wissenschaft und der Börse zusammengesetzten Komitee entschieden. Die Einführung dieses Index als zweites wichtiges Indexinstrument unseres Marktes und als Benchmark für Wachstumsunternehmen hat bereits jetzt zu regem Interesse seitens neuer Emittenten geführt. Mehr als 10 attraktive österreichische Unternehmen sehen nun auf Grund dieser Entwicklung eine Notiz an der Wiener Börse AG wieder als zu bevorzugende Alter-

nativen gegenüber anderen New-Economy-Märkten.

Die Wiener Börse AG sieht diese Initiativen für eine verstärkte Emissionstätigkeit auf dem österreichischen Aktienmarkt klarerweise und explizit in Verbindung mit der Einhaltung und ständiger Beobachtung aller Qualitätsnormen bei der erstmaligen Prospekterstellung bzw. Neueinführung und entsprechender Publizitätserfordernisse aller Emittenten. In Zusammenarbeit mit dem Bundesministerium für Finanzen werden wir hier unsere Standards – etwa bei der Prospekterstellung an die jeweiligen internationalen Gepflogenheit, insbesondere im EU-Rahmen – so flexibel wie möglich anpassen, aber auch ihre Umsetzung so streng wie notwendig prüfen.

Was die nun kommenden großvolumigen Emissionsvorhaben betrifft, lassen Sie mich einige wesentliche Faktoren noch einmal klar aussprechen:

- Eine umfassende Durchführung der geplanten Privatisierungsvorhaben über die Börse wird für den österreichischen Kapitalmarkt mit hoher Wahrscheinlichkeit ähnlich positive Auswirkungen haben wie dies in Deutschland oder Frankreich und anderen westeuropäischen Staaten – ausgelöst durch die

Telekom-Transaktionen – der Fall war.

- Dabei wird nach unserer Erfahrung ein angebotener Streubesitz von jeweils über 50 bis 60% zum wesentlichen kritischen Erfolgsfaktor für angemessene Liquidität und effiziente bzw. optimale Preisbildung.

Die Wiener Börse AG hat aus unserer Sicht im Bereich der Handels- und Informationsinstrumente und der Rahmenbedingungen für das Emissionsgeschäft die wichtigs-



ten Vorkehrungen für einen nach internationalen Maßstäben modernen und effizienten Kapitalmarkt getroffen.

Wir laden alle in- und ausländischen Marktteilnehmer – Emittenten, Handelsteilnehmer und Investmentbanken sowie private und internationale Investoren – dringend ein, diesen eigenen heimischen Kapitalmarkt auch wieder im vollem Maße und zum Wohle der Gesamtwirtschaft zu nutzen. 🐾

Technological change and firms' choices of stock markets¹⁾

I Introduction

While local stock markets have traditionally had a virtual monopoly on the listings of domestic firms, technological change has created an active “market for stock markets.” Several specific developments have lead to the competitive struggle



for listings that we observe today.

First, firms in general but internet-based new economy firms in particular have become global in their product market strategies and, as a result, also in their financing strategies. Because these firms frequently have customers in several countries, they also have informational advantages in more than one capital market. Second, the choice of a stock market has become an important strategic decision for firms. In today's competitive environment it is essential for firms to have quick access to funding and to obtain the product market quality signal and the publicity associated with the right stock market listing. Also, since the technologies and strategies used

by firms preparing an IPO can only be evaluated by highly specialised analysts, the choice of the right stock market becomes even more important.²⁾ Fourth, investors also have much easier access to foreign financial markets through new internet-based technologies. This creates a situation, where stock exchanges must compete not only for the listing but – if a stock has multiple listings – also for trading volume. The distribution of trading volume across exchanges is highly volatile and depends crucially on the trading system and regulatory environment of the relevant stock exchanges.

Despite the importance of these issues, still little is known about how and why technological change has affected the relative success of stock markets. This paper provides a discussion of these questions. The plan of the paper is as follows. Section 2 provides a discussion of the technological changes affecting stock markets and the firms which are going public. In Subsection 3.1 we analyze the overall pattern of foreign listings and cross-listings from 1986 to 1997 in light of the technological changes outlined in Section 2. Subsection 3.2 discusses the relationship between stock market characteristics on firms' listing behavior. Subsection 3.3 analyses the difference in listing

¹ This presentation draws extensively from: Pagano, M., Roell, A., Zechner, J. *The Geography of Equity Listings: Where do European Companies Cross-List?* Working paper, University of Vienna and CEPR 2000. I have had numerous enlightening discussions on this topic with Marco Pagano, Ailsa Roell, Otto Randl, Alex Stomper and Alfred Lehar.

² For a theoretical model of product market motives for stock market listings see Stoughton and Zechner (1999). The competition for listing has recently been modelled theoretically by Chemmanur and Fulghieri (1999).

choices between high-tech and non high-tech companies. Section 4 concludes.

2 Technological change and stock markets

2.1 Technological change and competition between stock markets

Historically, stock exchanges were insulated from each other by geographical barriers. It was virtually impossible to trade, say, the stock of a European company in New York, because information on this company was largely anchored in Europe. As a result, the local exchange had a monopoly. Now, information is much cheaper and can be transmitted easily and instantaneously, for example through the internet.

Furthermore, information about current quotes, about the limit order book etc. is very valuable. This information is also potentially easy to get out. This allows competition for the exchange to emerge via other stock exchanges or via Electronic Communication Networks, or dealers.¹⁾

Technological change has also triggered new stock market microstructures. Floor-based trading systems are challenged by automated trading systems. Quote driven systems are competing with order driven systems and/or hybrid systems.²⁾ Thus, technological change has introduced a new dimension of competition across stock markets namely their microstructure. This becomes particularly relevant if the same stock is listed on several exchanges. Trading volume can therefore migrate from one exchange to another very quickly.

A good example for this type of competition is provided by the Daimler Chrysler stock. In this case trading volume has been substantially reduced in New York and is now concentrated in Frankfurt.³⁾

Finally, technological change has affected the characteristics of listed companies and thereby contributed to more competition between stock markets. Firms have in general become increasingly global when choosing their input and output markets. This has important implications for their financing strategies. Since a firm's products and services are frequently known not only in the domestic market, information about the firm's prospects in the product market is also generated in the foreign markets. Firms may therefore be able to take advantage of information already produced abroad by selling shares in the foreign capital market. Thus, global firms are less likely to rely solely on the domestic financial market and thus introduce more competition between markets.

2.2 Technological change and the services required from equity markets

Technological change has also altered the skills and services which firms require from equity markets. Many of the recent IPOs are by so-called internet firms. These firms are frequently characterized by platform investments and network externalities. An example for a platform is the DOS or Windows operating system. The company which controls the platform is in an advantageous position to subsequently develop applications which are compatible with the platform. Another example

¹ For a discussion of the competition between ECN's stock markets and market makers, see Benhamou and Serval (1999).

² See Domowitz and Lee (1998).

³ See Karolyi (1998).

for a platform are so-called horizontal internet portals¹) (see Perotti and Rosetto, 2000) such as Yahoo or AOL. These companies are essentially focal points in the internet and they obtain a lot of information from their customers and may provide other firms access to potential new customers.

Firms which are investing in a platform are difficult to value with traditional methods, such as discounting expected cash flows. To a large extent the value of these firms



is created by future investment opportunities which are based on the initial platform. The current debate about the monopoly position of Microsoft is therefore also mostly centered around its “unfair” usage of the Windows technology in distributing other products such as web browsers.

Such investments should be viewed as a bundle of options and must be valued accordingly. This approach has become known as the real options approach. The intuition behind these valuation techniques is to utilize the results from option pricing and apply them to price stocks. These valuation techniques are relatively new and require much more expertise than traditional accounting based methods or methods such as the discounting of expected cash flows mentioned above.

Network externalities frequently make new economy firms very risky and hard to evaluate – at least during the first few years of their history. In a very simplified sense, network externalities exist whenever the utility derived from a good is affected by the number of consumers who also purchase the same good. As a result network externalities frequently imply that few firms become very successful whereas many other firms fail altogether. To better assess the potential of these network externalities, valuation of internet stocks is frequently driven by the “number of eyeballs,” i.e. the number of site visits per unit of time. Correct interpretation and forecasting of these figures also requires very specialized know-how.²)

The time pattern of typical investment projects in the new economy seems to differ from that of typical old economy firms. Frequently the former require large capital infusions over a number of years before the uncertainty can be resolved. Thus, for these firms the main motive for a stock market listing is to raise capital at a stage where profits have not yet been realized. It has therefore been frequently argued that accounting information may be of limited use when valuing these firms. Indeed, Yahoo had a P/E ratio of 1,382 by the end of November 1999. The eBay’s P/E ratio was 3,351, and Amazon.com’s stock price amounted to a price to revenue multiple of 22.9 (see Trueman, Wong and Zhang, 2000).

The valuation of internet based firms becomes particularly difficult, since most firms have a very short history, and even if there were enough historical information, industry structures are changing so

¹ For an analysis of pricing portals as platforms of entry options see Perotti and Rosetto (2000).

² See Trueman, Wong and Zhang (2000), and Rajgopal, Kotha and Venkatachalam (2000).

rapidly, that historical information would not be very useful.

Thus, technological change has made stock valuation more difficult because

- a) companies with very short histories require relatively large investments for an extended period of time,
- b) network externalities make the value of internet companies very volatile and
- c) the value of internet companies frequently comes to a large extent from the flexibility of realizing future investment opportunities. This type of investment cannot be easily valued using traditional valuation techniques such as DCF-methods.

3 Technological change and firms' listing choices

The above discussion of technological changes motivates a number of questions. Most importantly, it would be interesting to know how firms' listing decisions have changed over the last decade or so. How successful were stock exchanges in attracting new listings? Which exchanges do companies choose to obtain foreign listings? Have companies become generally more or less likely to cross-list on a foreign stock exchange? Which stock exchanges have been most successful in attracting foreign listings? How does a foreign listing affect firm performance?

Empirical examination of these questions would in principle require data on firm characteristics before and after they go public. Since data for representative samples of non-public firms are difficult to obtain one can alternatively use information from already listed companies by focussing on their cross-listing decisions. Pagano, Roell and Zechner (PRZ) (2000) provide extensive

empirical analysis of firms' cross-listing decisions. In the remainder of this section we discuss some of the results in PRZ (2000) and specifically relate them to the questions of technological change.

3.1 The geography of cross-listings

The geographical pattern of foreign listings is analyzed in PRZ (2000) for the stock exchanges Amsterdam, Brussels, Frankfurt, Milan, London, Madrid, Paris, Stockholm, Vienna, Easdaq, Amex, Nasdaq, and NYSE. They find that the geography of European and U.S. cross-listings has changed significantly between 1986 and 1997.

Specifically the number of EU-9 companies listed abroad almost doubled and the total number of their foreign listings increased by 61%. Thus, the data seem to confirm the hypothesis discussed above, that technological change has generally made firms more global in their financing strategies, thereby creating additional competition for stock exchanges.

Now, turning to the destination stock markets, PRZ (2000) find that most European exchanges exhibit an inverse U-shaped time pattern over time: The total number of foreign listings on European stock exchanges increased very slightly from 1986 to 1991, and then declined in 1997.

By contrast, U.S. stock exchanges have been very successful in attracting more foreign listings from European companies. The listings of EU-9 companies in the U.S. almost quadrupled in the time period between 1986 to 1997.

3.2 Relationship between listing and characteristics of stock exchanges

PRZ (2000) also relate the changes in the firms' cross-listing behavior to the characteristics of stock

exchanges. Although their sample of stock markets is very small (12 exchanges and 10 countries) some interesting observations can be made.

The market characteristics are defined by accounting standards, degree of investor protection, market index performance, size of the market (as measured both by market capitalization and turnover) and trading costs. These market characteristics can be related to the normalized net change on cross listings.¹⁾

The normalized net change in cross-listings appears to correlate positively with accounting standards and investor protection and negatively with trading costs. The Netherlands, Belgium and Austria have relatively low values for the former two variables. Sweden and the U.S. have instead the highest rating on accounting standards; Sweden fares a fair degree of investor protection and the U.S. scores very highly on this front. In general, Europe – except for the U.K. – compares negatively with the U.S., both in terms of accounting standards and in terms of investor protection.

Relating these results to our focus on the role of technological change, one can summarize that the quality certification role of stock markets seems to have become increasingly important. During the period of technological change analyzed by PRZ (2000), it seems that those exchanges which have tough listing procedures, good accounting standards, and strong investor protection have in general been the most successful in attracting foreign listings. This accords well with the hypothesis, that especially firms of the new economy prefer exchanges, for which listing delivers a strong quality signal to the product market.

The winning stock exchanges, i.e. mainly U.S. exchanges, also seem to be the ones where there is the most sophisticated know-how to evaluate and analyze new technologies. This is consistent with Baker, Nofsinger and Weaver (1999) who find that listing on the NYSE induces higher analyst coverage than listing in London.

3.3 Where do high-tech companies cross-list?

We will now investigate which firm characteristics make it desirable for firms to obtain a foreign cross-listing either in Europe or in the U.S. Table 8 in PRZ (2000) summarizes the results of a multinomial logit analysis of the determinants of the probability of listing abroad for the first time in any given year.

The set of determinants includes beginning-of-year values of the logarithm of total assets, leverage, the domestic exchange's average market-to-book ratio, the average of the three highest foreign market-to-book ratios, the previous year's total asset growth, proportion of sales abroad, and return on assets. The regression also includes a privatization dummy, calendar year dummies and regional origin dummies for each company: South (France, Italy and Spain), East (Austria and Germany), North (Sweden, Belgium and Netherlands) and the default (United Kingdom).

Since we are especially interested in the influence of technological change on firms' financing strategies, we will focus special attention on an explanatory variable in PRZ (2000) which is constructed to measure whether or not a firm belongs to a high-tech sector. This is a dummy variable which is set equal to one for a given firm if its SIC code indi-

¹ See table 3 in PRZ (2000) for a precise definition of net change.

cates that the firm belongs to an industry such as the drug and pharmaceutical industry, computer hardware industry, computer software industry, telecommunication industry, etc.¹⁾ This variable is designed to pick up any differences in the listing behavior of high-tech firms vis-à-vis other firms.

The regression results in PRZ (2000) reveal that belonging to a high-tech industry makes it significantly more likely for European firms to obtain a second stock market listing in the U.S. The estimated relative risk coefficient for the high-tech dummy variable turns out to be 3,670. This can be interpreted in the following way: The probability that a high-tech firm cross-lists in the U.S. is 3.67 times as high as the probability that a firm in a non high-tech sector cross-lists in the U.S. The estimate is also statistically highly significant (at the 99% confidence level).²⁾

In sharp contrast to this result, PRZ (2000) find that belonging to a high-tech industry does not make it more likely to cross-list on a European exchange. The relative risk ratio for these firms is only 0.218. Thus, the probability of cross-listing in Europe for high-tech firms is only 21.8% of the equivalent probability for non high-tech companies. However, this relative risk ratio is imprecisely estimated and thus statistically not significant.

Another result in PRZ (2000) sheds light on the influence of technological change on firms' listing decisions. They find that the companies that cross-list in the U.S. experience an additional increase in total assets and in the number of employees. In contrast, companies that

cross-list within Europe end up with a permanent reduction of total assets relative to the control sample. This result is consistent with the interpretation that new economy firms which are frequently characterized by their substantial funding needs prefer U.S. exchanges.

Summarizing, the overall picture is that in the decade from 1986 to 1997 a U.S. listing was a more natural choice for high-tech companies. This result gives specific support to the hypothesis that high-tech compa-



nies prefer access to stock markets with a rigorous regulatory environment, with sufficient expertise to evaluate new technologies and with the liquidity to provide capital needed to realize growth opportunities.

4 Conclusions

Technological change has profoundly influenced the characteristics of stock markets' customers. Firms with publicly listed shares are increasingly global both in terms of their input and their output markets. As a consequence, their financing strategies have become global also.

This trend is paralleled by an outward orientation by investors as well. Although there is still a home bias when it comes to investors' equity investments, they are increasingly realizing portfolio performance

1 A precise definition of the high-tech dummy variable is provided in table 8 in PRZ (2000).

2 This is also consistent with the finding in Blass and Yafeh (1999) who find that high-tech Israeli firms tend to list in the U.S.

improvements by diversifying internationally. Investing in foreign securities has become much simpler through improved information flows across national borders and through the use of internet-based services.

Another major effect of the current technological change pertains to the characteristics of new firms which go public. Increasingly, these firms are internet-based and belong to the new economy. Frequently these firms' major asset is knowledge and they require investments for



extensive periods of time before they generate positive cash flows. We have argued that platform characteristics imply that these firms should be viewed as a bundle of options on future investment opportunities. Traditional

balance sheet or expected cash flow based valuation methods are therefore not well suited to calculate the market value of such firms.

The dynamics of competition among internet-based firms makes one aspect of a stock-market listing much more important: publicity and certification. Being accepted for listing on a reputable stock exchange may provide significant benefits in the product market. After the listing, the stock price provides a permanent, independent, and objective assessment of the firm's future prospects.

All these trends lead to more competition between stock exchanges. In this situation the characteristics of financial markets become increasingly important. The question is what makes stock markets succeed in this new technology environment?

The empirical evidence found by PRZ (2000) on firms' listing decisions is somewhat unsettling from a European perspective. European

stock exchanges have generally lost foreign listings over the last decade. European firms are more frequently obtaining listings in the U.S. whereas U.S. firms are less likely to apply for a listing on one of Europe's exchanges.

In addition PRZ (2000) present evidence that especially the more dynamic, high-tech, growth-oriented European companies prefer the U.S. as a location as a foreign listing. A second listing in the U.S. generally seems to have more desirable effects on leverage and growth compared to the effects of European cross-listings.

How can these results be explained? Although no definite answer to this question is possible, a couple of observations can be made. First, the U.S. stock markets may be better able to evaluate new economy firms thereby providing funds more cheaply. This accords well with the finding by Baker, Nofsinger and Weaver (1999) that listing on the NYSE induces higher analyst coverage than listing in London. Second, the more rigorous investor protection, disclosure and accounting standards are likely to give a stronger signal to the firms' product markets. Third, size of the capital market seems to matter. European equity markets are still fairly fragmented, especially when it comes to settlement procedures.

For a number of reasons the analysis of the decade from 1986 to 1997 may paint an excessively pessimistic picture for European stock exchanges. First, the recent listings of high-tech companies especially on the Neuer Markt in Frankfurt may have improved the relative performance of European equity markets vis-à-vis the U.S. in the years since 1998. More generally, an increasingly homogenous regulatory environment within the EU and the

increasing acceptance of IAS as a uniform accounting standard may introduce economies of scale so that the necessary investments in technology and human capital may become more viable for Europe.

Most importantly, however, one needs to keep in mind that a dynamic interplay between technological change and stock markets will continue. The main determinant of success in such an environment will be human capital and creativity. Those countries, companies and networks which can develop and attract these resources will ultimately succeed in attracting financial activity. ☛

References

- Baker, H., Kent, J., Nofsinger, R., Weaver, D. G. (1999).** International Cross-Listing and Visibility. In: NYSE Working paper no. 99–101.
- Blass, A., Yafeh, Y. (1999).** Vagabond Shoes Longing to Stray: Why Foreign Firms List in the United States. Hebrew University, unpublished manuscript.
- Benhamou, E., Serval, T. (1999).** On the Competition between ECNs, Stock Markets and Market Makers. Working paper.
- Chemmanur, T. J., Fulghieri, P. (1999).** Choosing an Exchange to List Equity: A Theory of Dual Listing, Listing Requirements, and Competition among Exchanges. INSEAD, unpublished manuscript.
- Domowitz, I., Lee, R. (1998).** The Legal Basis for Stock Exchanges: The Classification and Regulation of Automated Trading Systems. Working paper.
- Karolyi, G. A. (1998).** Why do companies list shares abroad? A survey of the evidence and its managerial implications. In: Financial Markets, Institutions & Instruments 7. New York University Salomon Center.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R. W. (1998).** Law and Finance. In: Journal of Political Economy 106, 1113–1155.
- Pagano, M., Roell, A., Zechner, J. (2000).** The Geography of Equity Listings: Why do European Companies List Abroad. CEPR working paper.
- Perotti, E., Rossetto, S. (2000).** The Pricing of Internet Stocks: Portals as Platforms of Entry Options. Working paper.
- Rajgopal, S., Kotha, S., Venkatachalam, M. (2000).** The Relevance of Web Traffic for Internet Stock Prices. Working paper.
- Stoughton, N., Wong, K. P., Zechner, J. (1999).** IPO's and Product Quality. Working paper. University of Vienna.
- Trueman, B., Wong M. H. F., Zhang, X. J. (2000).** The Eyeballs Have it: Searching for the Value in Internet Stocks. Working paper.

KARL-HEINZ GRASSER



Aktuelle österreichische Finanz- und Wirtschaftspolitik im europäischen Zusammenhang

Die neue österreichische Bundesregierung ist bereit, die Entscheidungen, die die frühere Bundesregierung vor sich her geschoben hat, zu treffen. Österreich ist in den verschiedensten Bereichen zu erneuern. Diese Aufgabe ist insbesondere dadurch möglich, dass diese Bundesregierung zwar aus zwei verschiedenen Parteien zusammengesetzt ist, diese aber als ein Ganzes, als eine Bundesregierung und wie ein Team wirken.

Das aktuelle Beispiel für dieses entschlossene Zusammenwirken ist die Lösung eines elfjährigen Problems, nämlich das der Anonymität der Sparbücher. Österreich wurde von der OECD-Arbeitsgruppe FATF, der 28 OECD-Staaten angehören, bereits auflösend bedingt ausgeschlossen, weil es mit der Konstruktion der Anonymität der Sparbücher nicht die Auflagen zur Bekämpfung der internationalen Kriminalität im Finanzbereich und im Sparbuchbereich erfüllt hatte. Fazit: Österreich wird in der FATF bleiben. Damit ist es dieser Bundesregierung gelungen, ein Problem in

einem Bereich, wo Österreich seit 1989 laufend gerügt wird – seit 1995 übrigens auch vor dem Europäischen Gerichtshof durch ein Vertragsverletzungsverfahren –, in den ersten vier Monaten ab Amtsantritt vom Tisch zu schaffen. Bei der gefundenen Lösung wurden die Interessen der österreichischen Sparer gewahrt und damit eine Balance zwischen bewährter Sparkultur einerseits und dem Erfüllen international bewährter Standards zur Bekämpfung der Kriminalität und der Geldwäsche andererseits zustande gebracht.



Die Erneuerung des Landes ist insbesondere auch an der Finanzpolitik ablesbar. Ich betone: Es geht hier um das Tun und nicht um das Reden. An der Finanzpolitik kann man ermes sen, welche Entscheidungen wirklich gefallen sind und welche Auswirkungen es tatsächlich auf die Bevölkerung hat.

In der Finanzpolitik bekenne ich mich ganz klar zu den Verpflichtungen aus dem Stabilitäts- und Wachstumspakt, nicht nur weil es hier EU-Regeln gibt, sondern weil die Einhaltung dieser Regeln auch das Beste für dieses Land ist. Auch hier gibt es ein Problem, das die frühere Bundesregierung nicht gelöst hat und das in den letzten Monaten offensichtlich wurde: Wir haben 1998/99 in Österreich keine weiteren Konsolidierungsbemühungen bei den öffentlichen Finanzen gehabt – wir sind mit der Konsolidierung stecken geblieben. Die Bundesregierung strebt für das Jahr 2000 ein gesamtstaatliches Defizit von 1,7% des Bruttoinlandsprodukts an. Zudem hat der Staat eine Finanzschuld in der Größenordnung von 64 bis 65% des Bruttoinlandsprodukts. In anderen Ländern der Europäischen

Union hat man hingegen in den Jahren 1998/99 bei der Konsolidierung der Haushalte massive Fortschritte machen können.

Die derzeit exzellente Hochkonjunktur hilft uns bei diesem Konsolidierungspfad. So war es zwar von der Dimension her ein bisschen überraschend, aber von der Richtung her zu erwarten, dass Anfang Juni beim ECOFIN-Rat alle Länder mit Ausnahme Deutschlands und Österreichs – in Deutschland verursacht durch die Steuerreform – bereit waren, den Stabilitäts- und Wachstumspakt, der eigentlich für das Jahr 2002 vorgesehen war, bereits 2001 voll zu erfüllen. Das bedeutet, bereits 2001 einen Budgetsaldo „close to balance“ oder „in surplus“ zu erreichen. Das wäre mit den österreichischen Zielsetzungen nicht vereinbar, die bisher nach Regierungsprogramm für heuer 1,7% anstreben und dann Senkungen um jeweils 0,1% des Defizits, also 1,6, 1,5 bzw. 1,4%. Österreich wird diesen alten Weg nicht gehen können, weil sonst die Kluft zwischen den Ergebnissen österreichischer Finanzpolitik und denen aller anderen Mitgliedsländer zu groß würde.

Ich kann jetzt der Entscheidung der Bundesregierung nicht vorgreifen, aber ich habe im ECOFIN-Rat versprochen, dass wir zumindest das erreichen werden, was Deutschland anstrebt, nämlich 1,5% für das Jahr 2001, 1% für 2002, 0,5% für 2003. Das ist eine Größenordnung, die plausibel mit „close to balance“ oder „in surplus“ interpretiert werden kann. Ich möchte betonen, diese Größen sind das Minimum dessen, was ich der Bundesregierung vorgeschlagen werde. Als Finanzminister muss ich dieser Bundesregierung sagen, dass die Staatsfinanzen in Ordnung zu bringen sind. (Hinweis: Diese Ziele wurden im Juli 2000 neu definiert: Bis zum Jahr 2002 soll –

erstmal seit 27 Jahren – ein ausgeglichenes Budget erreicht werden. Das gesamte öffentliche Defizit, also jenes von Bund, Ländern, Gemeinden, Sozialversicherung und Kammern zusammen, soll im Jahr 2001 nicht über 1,3% des BIP liegen und für die Jahre 2002 und 2003 jeweils auf null sinken.)

Österreich ist eines der reichsten Länder in Europa und weltweit. Es hat maßgebliche Investitionen in die Zukunft gegeben, damit sich die Bürger heute über diesen Wohlstand freuen können. Aber in jedem Unternehmen muss man irgendwann einmal damit beginnen, auch zurückzuzahlen. Diese Zeit ist in Österreich jetzt gekommen. Daher ist es mein persönliches Anliegen, auch vor die Bevölkerung hinzutreten und zu sagen: Wir ändern die Finanzpolitik dieses Landes grundsätzlich, weil es gilt, die Ziele der Wirtschaftspolitik abzusichern. Diese sind ein hoher Grad an Geldwertstabilität in Österreich, hohe Wachstumsraten und Vollbeschäftigung – wir haben zurzeit nur 3,3% Arbeitslosigkeit. Österreich hat im Jahr 2000 hervorragende ökonomische Eckdaten, mit Ausnahme eben der finanzpolitischen, und hier muss daher nachjustiert werden.

Das heißt, wir wollen die Staatsfinanzen in Ordnung bringen und werden das gemeinsam mit der Bevölkerung machen: Das, was an Leistungen in der Vergangenheit zustande gebracht wurde, muss jetzt fortgesetzt werden. Dazu gehört auch das Bekenntnis zur nächsten Generation, das Bekenntnis zu unseren Kindern. Wir dürfen nicht heute mit einer noch größeren Neigung zum Konsum das Geld ausgeben, das in Zukunft eine andere Generation belasten würde. Insofern ist es eine Notwendigkeit ohne Alternative.

Wir haben uns in den letzten Monaten nicht unbedingt über besondere europäische Unterstützung freuen können. Meine Aussagen zur Finanzpolitik sind im ECOFIN-Rat aber sehr wohl positiv aufgenommen worden. Meine europäischen Kollegen und ich stimmen überein, dass Österreich zwei Jahre leider nichts getan hat und jetzt daher umso stärker konsolidieren muss. Und mit dieser Unterstützung meiner europäischen Kollegen, des Internationalen Währungsfonds, der



OECD und nationaler Wirtschaftsforscher hat die Bundesregierung ein gerüttelt Maß an Kritik zu Recht aushalten müssen. Sie wird versuchen, das in positive Energie für umso größere Anstrengungen in der Finanzpolitik umzuwandeln.

Veränderungen müssen vor allem auf der Ausgabenseite der öffentlichen Haushalte vorgenommen werden. Durch Strukturreformen sollen teilweise tradierte Entwicklungen, manchmal auch noch eine monarchistisch geprägte Entwicklung gebrochen werden. Hier sind vor allem die Verwaltung und der öffentliche Bereich in Österreich zu nennen. Österreich leistet sich eine Verwaltung, die New Economy und Paradigmenwandel, wie sie heute international diskutiert werden, völlig negiert. Der Beitritt zur Europäischen Union ist spurlos an ihr vorübergegangen: Es gibt noch immer die Gemeindeebene, die Bezirkshauptmannschaften, die Landesebene, die Bundesebene und eben

auch zusätzlich die europäische Ebene und vieles mehr. Hier wird es also darum gehen, wirklich zu schlanken Strukturen zu finden.

Ich bedaure, dass privatwirtschaftliche Möglichkeiten dienstrechtlich nicht immer gegeben sind. Insofern muss man versuchen, den Sack oben ganz zuzumachen und überhaupt nicht nachzubeseetzen, um so noch stärkeren Druck machen zu können, damit Aufgabenreformen wirklich stattfinden. Ausgangspunkte der Reform haben folgende Fragestellungen zu sein:

Was nützt der Bevölkerung? Was macht ökonomisch Sinn in unserem Land? Und wo kann man in Zukunft Aufgaben weglassen? Wo kann man Aufgaben einsparen? Ich bekenne mich dazu, dass zumindest

13.000 Beamte in dieser Legislaturperiode abbaubar sind, das sind 9.000 plus etwa 4.000 in ausgliederten Bereichen. Das ist erreichbar.

Ein weiterer Punkt betrifft das Pensionssystem. Die Pensionsreform wird vor dem Sommer beschlossen und soll die Ausgabendynamik in diesem Bereich brechen. Ohne Maßnahmen würde bis 2003 der Bundeszuschuss um etwa 28 Mrd ATS ansteigen. Wir machen eine Reform, die dazu führt, dass der Zuschuss nur um etwa 12 Mrd ATS steigt, also sparen wir hier etwa 15 oder 16 Mrd ATS an zusätzlichen Ausgaben ein. Ich glaube aber, dass man in manchen Bereichen den Reformbedarf noch nicht ernsthaft genug diskutiert. Die Pensionen bei der Bundesbahn sind so ein österreichisches Unikum. Hier gibt es ein Frühpensionsalter von 53 Jahren, und man diskutiert jetzt, dies auf 54,5 Jahre anzuheben. Ich denke, wenn man der Bevölkerung soziale Gerechtigkeit verspricht, dann sollte

man in Wirklichkeit eine Diskussion führen, die heißt: anstatt 53 auch 61,5 Jahre, zumindest für die Bereiche, die verwaltungsorientiert sind und die nicht Schwer- oder Schwerstarbeit im Sinne der Tätigkeiten von Lokomotivführern, Verschiebern in den Bahnhöfen usw. mit sich bringen. Ich glaube, man muss Zweiklassengesellschaften beenden und sagen, wie man soziale Gerechtigkeit und Fairness in Summe für die gesamte Bevölkerung zustande bringt. Das heißt, man kann und soll in manchen Bereichen stärker justieren. Man wird auch nicht umhinkommen, in einem zweiten Schritt nach einer wichtigen und richtigen Pensionsreform, die wir als Strukturreform jetzt beschließen werden, die Umstellung des Pensionssystems auf ein Drei-Säulen-System natürlich auch in Österreich voranzutreiben. Ein solches besteht aus betrieblicher und privater Absicherung. Weite Teile der Bevölkerung misstrauen dem bestehenden öffentlichen Pensionssystem zu Recht, weil eine um die andere Politikergeneration immer wieder in Österreich verspricht, dass die Pensionen gesichert wären, während gleichzeitig alle zwei, drei Jahre eine neue Pensionsreform gemacht wird. Deswegen denke ich, sollte man auch hier Ernst machen und als zweiten Schritt eine grundsätzliche Reform auch in diesem Bereich zustande bringen.

Ein weiteres Feld für mehr Spielraum im Budget ist die Senkung der Zinsbelastung. Österreich hat derzeit allein eine Zinsbelastung in einer Größenordnung von 100 Mrd ATS pro Jahr, dazu kommen Tilgungen von etwa 150 Mrd ATS. Bei einem Bruttoinlandsprodukt von etwa 2.800 Mrd ATS muss ein guter Teil erst für den Konsum der Vergangenheit erwirtschaftet werden. Gleichzeitig haben wir deshalb eine



hohe Staatsquote und daher hohe Steuern und Abgaben. Dies ist ein Korsett, aus dem man nicht leicht ausbrechen kann. Daher ist Schuldentrückzahlung eines der ganz wesentlichen Themen in dieser Bundesregierung. Das ist auch ein Appell an die anderen Gebietskörperschaften, an die Städte, Gemeinden und Länder. Dort liegen etwa 170 Mrd ATS Schulden. Es ist in Österreich sehr viel öffentliches Vermögen vorhanden, sodass diese 170 Mrd ATS in dieser Legislaturperiode bei gutem Willen zurückzahlbar sind. Ich halte auf Bundesebene 150 bis 200 Mrd ATS ebenfalls in dieser Legislaturperiode für rückzahlbar. Das könnte gesamtstaatlich ein schönes Potenzial ergeben: Bei einer Durchschnittsverzinsung von 5,5% sind dies 10 Mrd ATS oder mehr. Diese etwa 10 Mrd ATS auf den Ebenen Bund, Länder, Städte und Gemeinden geben strukturellen Spielraum in den öffentlichen Haushalten. Daran arbeiten wir daher massiv und bekennen uns dazu, die Privatisierung in Österreich voranzutreiben.

Die neue Bundesregierung fühlt sich der Liberalisierung der Märkte und der Deregulierung verpflichtet. Das bestehende System wurde von Juristen geschaffen, die, wenn ich so sagen darf, überlegt hatten, was alles im Wirtschaftsleben passieren könnte und warum man etwas nicht zulassen sollte. Das heißt, man hat einen negativen Ansatz gewählt, bei dem ein Unternehmen zuerst alles Mögliche erfüllen muss, bevor es wirtschaften kann. Ich meine, in einer globalisierten Welt bei integrierten, vernetzten Märkten sollte eigentlich die Kundschaft darüber entscheiden, wer unternehmerisch tätig ist. Wenn die Kunden zufrieden sind, weil die Produkte passen, weil das Unternehmen zu innerer Innovation in der Lage ist, dann wird

dieses Unternehmen Erfolg haben. Kundenbefriedigung ist heute die einzige Existenzberechtigung. Und das sollte man auch in Österreich erkennen, und dazu braucht man also eine grundlegende Gewerbeordnungsreform.

Die Privatisierung ist auch notwendig, weil Österreich noch immer einen relativ hohen Anteil an verstaatlichten und teilverstaatlichten Unternehmen hat. Hier gibt es bereits gesetzliche Beschlüsse des Nationalrats und des Bundesrats. Mit dem Privatisierungsprogramm dieser Bundesregierung soll das, was Schweden mit der Telekom gezeigt hat, in absehbarer Zeit auch in Österreich nachgeholt werden. In einer ersten Phase werden unter anderem die P.S.K., der Flughafen Wien und das österreichische Tabakmonopol privatisiert werden. Es ist vollkommen klar: Moderne Wirtschaftspolitik kann nicht heißen, Mauern rund um Österreich zu bauen und zu glauben, man kann staatliche Beschäftigungspolitik oder direkt eingreifende Wirtschaftspolitik machen. Es ist – im Gegenteil – eine Frage der Rahmenbedingungen, es ist eine Frage der schnellen Problemlösungen, der Bewilligungsverfahren, auch eine Frage der Kostensituation, um die Lohnnebenkostenproblematik anzusprechen. Wirtschaftspolitik heißt, Rahmenbedingungen zu gestalten, um unsere Unternehmen wettbewerbsfähig zu machen. Daher wird es hier mit dieser Privatisierung, glaube ich, auch einen wichtigen Impuls für den Kapitalmarkt geben.

Denn auch der Kapitalmarkt ist ein Thema, wo man bis jetzt offensichtlich Ängste vor zu viel und zu freiem Kapital in Österreich gehabt hat; dies in Verkennung der Tatsache,



dass eine florierende Börse und ein boomender Kapitalmarkt in Wirklichkeit allen nützt. Ein Engpassfaktor für mehr Wachstum in den Unternehmen wäre beseitigt und damit auch die Ursache für viele Insolvenzen. Wir müssen mehr Kapital über die Börse zur Verfügung stellen, damit dort über steigende Kurse Umsatzvervielfältigungen und so die Schaffung neuer Arbeitsplätze möglich gemacht werden. Dazu müssen wir in Österreich eine Aktienkultur zustande bringen. Man



kann heute nicht mehr sagen, dass Eckzins-sparbuch und Anonymität Wirtschaftserfolg garantieren. Die Banken müssen lernen, dass es um moderne Produkte geht und man hier versuchen sollte, den Österreichern entsprechende Renditen zu ermöglichen. Wenn man den deutschen Aktienindex mit dem österreichischen vergleicht: 1992 lagen ATX und DAX beide bei 1.200 Punkten. Heute steht der ATX noch immer ungefähr dort, der DAX steht bei jenseits der 7.000 Punkte. Dazwischen liegen mehr als 1.000 Mrd ATS nicht geschaffenes Vermögen in Österreich. Und daher liegt dort eine riesige Chance und ein riesiges Potenzial für unser Land. Daraus ergibt sich im Umkehrschluss, dass österreichische Werte enorm billig sind. Insofern ist hier eine gemeinsame Offensive für den Kapitalmarkt natürlich auch ein Ziel dieser Bundesregierung, weil wir glauben, dass es auch eine Budgetsanierung geben kann, die niemanden schmerzt. Von steigenden Umsätzen, steigender Wertschöpfung und Beschäftigung und steigenden Einkommen der Bevölkerung profitiert natürlich auch der Finanzminister ein bisschen, und zwar ohne

dass die Steuerschraube irgendwo angezogen werden muss.

International diskutieren wir auch den Übergang von der Old Economy auf die New Economy. Ob mit Paradigmenwandel oder ohne: Klar ist, es gibt ein enormes Wachstumspotenzial in allem, was Telekommunikation, was Internet, was neue Medien betrifft. Dieses Wachstumspotenzial wurde vor allem in Amerika genutzt. Ich glaube die Herausforderung in Europa ist es, ein europäisches Wirtschaftsmodell zustande zu bringen, das im Unterschied zum amerikanischen sicherlich auf einer Säule mehr basieren muss. Diese Säulen sind Liberalisierung, Wettbewerb, eine Ergänzung der Old und der New Economy. Es sind Maßnahmen im Bildungs-, Ausbildungs- und Schulbereich sowie eine innovationsbegünstigende, anwendungsorientierte Forschung und Entwicklung. Auch die öffentlichen Haushalte sind in diese Richtung zu gestalten. Eine wichtige Ergänzung ist die sozialstaatliche Absicherung, denn diese ist der Vorteil Europas im Vergleich zu Amerika. Während in Amerika mehr Wettbewerb automatisch mit einer Entwicklung verbunden ist, die viele Menschen auch sozial an den Rand gedrängt hat, weil sie mit dieser Geschwindigkeit nicht mithalten können, betrachte ich es bei dem Wohlstand, den Österreich hat, als politische Verpflichtung, auch in Zukunft soziale Absicherung zu gewährleisten. Das österreichische und europäische Modell hat daher zwei Säulen: eine liberalisierte, im Wettbewerb bestehende Wirtschaft einerseits und staatliche Absicherung andererseits.

Darauf arbeiten sicherlich der ECOFIN-Rat und die Euro-11-Gruppe hin, trotz aller Schwächen, die am Anfang einer gemeinsamen Währung fast dazugehören müssen.

Da es ja vor allem um den inneren Wert des Euro in Europa geht, haben diese Schwächen nicht ganz so dramatische Auswirkungen, wie sie sich früher durch die Auf- und Abwertungen der einzelnen nationalen Währungen immer wieder ergeben haben. Ich bin aber auch der Meinung, dass der Euro für mich keine rational nachvollziehbare Entwicklung nimmt: Wenn die Hypothese stimmt, dass der Dollar auf Grund der noch wesentlich höheren Wachstumsraten so stark wäre, müsste dann nicht der Euro zumindest gegenüber dem Yen wesentlich stärker sein? Insofern kommt ein bisschen Irrationalität ins Spiel. Auf der anderen Seite aber gibt es in Österreich einen Notenbank-Gouverneur und einen Finanzminister, und in zehn anderen Ländern ebenso. Zudem gibt es noch die Europäische Zentralbank und ihr Direktorium. Und jeder sagt natürlich, was er über den Euro denkt, trotz des Versuchs einer gemeinsamen Analyse und Sprachregelung. Insgesamt sind das so viele „Spieler“, dass die Homogenität nur schwer vermittelt werden kann.

Es gibt in der europäischen Debatte Situationen, wo ein Mehr an Miteinander und das Zurückdrängen gewisser Eitelkeiten sicherlich helfen würde zu zeigen: Es ist ein Europa tatsächlich auf gemeinsamer Wertebasis und ein Europa, wo diese Idee – ob das die Friedensidee, die Sicherheitsidee oder die Wirtschafts-idee ist – auch wirklich von allen gemeinsam mit gleichen Rechten und Pflichten verfolgt wird. Für den Wert einer Währung ist klar, dass das auch mit eine Rolle spielt. Klarheit und Sicherheit wäre auch besser für den Vertiefungsprozess der Union. Zu klären wären: Was heißt Vertiefung? Wie verändern sich die Strukturen tatsächlich? Da muss

man ein klares Szenario und einen klaren Zeithorizont schaffen können, damit man zeigt: Europa ist auch entscheidungsfähig. Und dann muss es in den nächsten Schritt gehen zu sagen: Wie sieht es mit der Erweiterung aus? Und auch hier gibt es natürlich das Bekenntnis der Bundesregierung zur Erweiterung. Die Geschwindigkeit der Erweiterung liegt für mich ausschließlich an den Beitrittsländern. Denn je schneller es geht, dort ökonomische und soziale Standards zu erreichen, die mit denen in Europa halbwegs mithalten können, umso eher wird es auch gelingen, die Integration zu vertiefen und die Osterweiterung positiv und konstruktiv für alle in Europa entsprechend durchzuführen.

Ich denke, dass wir noch einiges zu leisten haben werden und in Bezug auf die Schaffung einer wirklichen Wertegemeinschaft und eine wirkliche Weiterentwicklung im Spannungsfeld Bundesstaat – föderale Struktur – Europa der Vaterländer. Ich finde, wir haben viel zu viele alte Definitionen, die für die Zukunft nicht brauchbar sind. Man wird hier ein wirklich neues europäisches Modell entwickeln müssen, das vielleicht um ein Kerneuropa auf Basis der Mehrstimmigkeit und in vielen weiteren Bereichen auf der Einstimmigkeit basieren wird. Ich glaube, wir alle haben insofern eine spannende Zeit vor uns.

Anmerkung: Diese Rede wurde am 15. Juni 2000 anlässlich der Volkswirtschaftlichen Tagung der OeNB gehalten. Sie spiegelt daher den Stand des politischen Diskurses und der budgetären Ziele zu diesem Zeitpunkt wider.



WOLFGANG SCHÜSSEL



Kamingepräch: Aktuelle Fragen der Wirtschaftspolitik

Sehen Sie sich das Leben Karls V. an! Die Ausstellung, die ich gestern in Wien eröffnen durfte und die ich für eine absolute Muss-Ausstellung halte, zeigt Dinge, die es in dieser Form noch nie gegeben hat. Sie ist eine sehr europäische Ausstellung, die alle Sonnen- und Schattenseiten unserer Geschichte beleuchtet. Das Interessante an den Jahrzehnten um 1500 und an der Person Karls V. sind die Parallelen, die man zur Gegenwart ziehen kann.

Das Europa von heute hat natürlich wenig zu tun mit dem Europa, mit dem Reich, in dem die Sonne nie untergegangen ist. Und Karl V., der sicher der mächtigste aller Kaiser gewesen ist, gilt nicht als Proto-Europäer schlechthin, sondern ist durchaus eine Figur seiner Zeit. Aber, und das ist interessant: Damals wie heute gab es ein echtes Wende- und Zäsurbewusstsein. Es war eine Zeit, in der zum ersten Mal wirklich Globalisierung spürbar geworden ist. Die amerikanischen Kolonien wurden entdeckt und unermessliche Schätze von Südamerika nach Europa transferiert.

Die Habsburger waren damals eines der reichsten Herrscherhäuser, und Karl V. war sicher der Reichste von ihnen, zugleich aber auch der größte Schuldner. Der spanische Staat musste praktisch seine Zahlungsunfähigkeit nach seinem Tod annonciieren.

Budgetprobleme waren damals hoch aktuell und sind es natürlich auch heute. Zum Unterschied von heute wurde damals allerdings das gesamte Geld, und das waren Milliarden und Abermilliarden, in eine



gigantische Aufrüstung gesteckt. Unglaubliche Gräueltaten, die die Identität von Kulturen vernichteten, wurden damit finanziert. Als Lehre bleibt uns daher, behutsam mit der Bewahrung der Vielfalt, der Bewahrung

der Identität der Menschen, der Völker, der Kulturen umzugehen.

In der ganzen Ära Karls V. gab es den Konflikt zwischen drohendem Zerfall und den Bemühungen um die Bewahrung der Einheit Europas, auch der Einheit der Kirche. Das Konfliktzentrum war also gleichzeitig Peripherie, eine Situation, die Sie nahtlos auf die heutige Situation Europas übertragen können und die natürlich auch Österreich enorm berührt. Auch in unserem Regierungsprogramm mit seinem Leitmotiv „Österreich neu regieren“ steckt sehr viel Zäsurbewusstsein. Wir stehen vor der Notwendigkeit, die richtigen Veränderungen für Österreich und in Österreich vorzunehmen und wahrzunehmen. Gleichzeitig müssen wir die Erweiterung der EU in die richtigen Bahnen lenken, damit wir Kapital aus dieser ungeheuren Chance für uns schlagen können.

In den viereinhalb Monaten, die wir jetzt regieren, sind einige heilige

Kühe wenn schon nicht geschlachtet so doch zumindest auf Diät gesetzt worden. Wir haben sie einfach ein bisschen aus den beheizten Ställen hinausgeführt und setzen sie jetzt dem Kontakt mit der frischen Luft des Marktes aus. Vor allem die Budgetproblematik wird von uns sehr ernst genommen. Die Details zur Budgetsanierung hat Ihnen schon der Finanzminister näher gebracht. Lassen Sie mich aber nochmals betonen, dass es unser Ziel sein muss, in dieser Legislaturperiode auf gesamtstaatlicher Ebene ein ausgeglichenes Budget zu erreichen. Die Wirtschaftsforscher und der Vorsitzende des Staatsschuldenausschusses wissen ganz genau, wie ambitioniert dieses Ziel ist, und auch die Regierung ist sich bewusst, dass Ihre Arbeit am Ende der Legislaturperiode an der erfolgreichen Umsetzung gemessen wird.

Zentrale Bedeutung in diesem Zusammenhang kommt der notwendigen Reform unseres Pensionssystems zu. Die Streikdrohungen der Arbeitnehmer, von der Arbeiterkammer und von den Gewerkschaftern im öffentlichen Dienst sind nicht besonders hilfreich, aber rechtzeitiges Handeln – und davon bin ich zutiefst überzeugt – ist die einzige wahre und ehrliche soziale Gerechtigkeit. Man kann und darf nicht warten, bis der Finanzkollaps bei den Pensionssystemen eintritt. Vielleicht kann man uns sogar vorwerfen, dass wir noch ambitionierter agieren hätten müssen. Ziel ist es, die Zuwächse des Zuschussbedarfs des Bundes an die Pensionsversicherungen innerhalb dieser Legislaturperiode zu halbieren. Meine Ambition ist es, dies möglichst ohne soziale Turbulenzen und Streiks zu realisieren. Das kann aber nicht heißen, dass wir in der Substanz Konzessionen machen, denn da müssen wir fest bleiben. Nachgeben

wäre hier für die Regierung sicher einfacher, aber das wäre verantwortungslos gegenüber der nächsten Generation.

Der dritte Bereich betrifft die öffentliche Verwaltung. Der Verwaltungsanteil in Österreich ist sicherlich zu hoch. Ob nun 1 oder 2% des Bruttoinlandsprodukts, in jedem Fall sind es substantielle Bereiche, über die diskutiert werden muss. Ein Teil ist durch den Föderalismus erklärbar – neun Bundesländer und subsidiäre Strukturen. Hier wollen wir auch nichts ändern, aber ich glaube, dass in einer besseren Aufgabenverteilung zwischen den Gebietskörperschaften sehr viel Einspar- und Rationalisierungspotenzial steckt. Das, was an Produktivitätsvorteilen im Privatsektor möglich ist, muss in einer modifizierten Form in gleicher Weise auch im öffentlichen Sektor nutzbar gemacht werden.

Das Thema der Sparbuchanonymität, das in Österreich über viele Jahre hinweg als Tabuthema galt, haben wir wenige Tage nach Regierungsantritt in Angriff genommen und gelöst. Ich bin schon ein wenig stolz darauf, dass es uns gelungen ist, ohne Turbulenzen im Sparerverhalten, ohne größere öffentliche Diskussion diese Frage so zu lösen, dass die FATF die Maßnahmen in der BWG-Novelle ausdrücklich gelobt hat. Sobald der Bundesrat im Parlament seinen Beschluss gefasst hat, werden wir auch mit der EU-Kommission Kontakt aufnehmen, damit die Klage vor dem EuGH zurückgezogen wird. Ich bin zuversichtlich, dass uns dies auch gelingen wird.

Sogar Stuart Eizenstat, der ja kein einfacher Verhandler ist, hat erst kürzlich in einer Aussendung die österreichische Bundesregierung wegen ihrer schnellen und effizienten Handlungsweise gelobt, weil er das in dieser Form noch nie erlebt

hat. Rasches Handeln in der Frage der Zwangsarbeiter ist unumgänglich, denn nur, wer Geschichte und Gegenwart rasch und ehrlich aufarbeitet, hat das Recht, selbstbewusst in Zukunftsfragen auftreten zu können. Eine Vierparteieneinigung ist zurzeit im Entstehen. Sie wird noch vor dem Sommer beschlossen werden, und ich bin sicher, dass letztlich auch die Finanzmittel vollkommen außer Streit stehen. Hinter den Kulissen gab es jedenfalls schon Vorabsprachen dazu.



In drei Tagen, beim Europäischen Rat in Feira, werden wir das Aktionsprogramm eEurope beschließen, verbunden mit einem sehr ambitionierten Förderungsprogramm an uns selbst. Mein Ehrgeiz ist es, dass wir hier eine Vorreiterrolle übernehmen: Wir sind etwa das erste Mitgliedsland, das die Signatur-Richtlinie schon umgesetzt hat. Und auch bei allen anderen 63 konkreten Punkten, die in diesem Aktionsprogramm enthalten sind, wollen wir jenes Land sein, das sie am schnellsten umsetzt, weil das in unserem eigenen Interesse liegt. Wir wollen hier nicht Schlusslicht bleiben wie bei der Budgetfrage, sondern wir wollen uns wieder in die Spitzengruppe vorarbeiten.

Spannende positive Entwicklungen sehe ich in der New Economy. Die Jobchancen in diesem Bereich sind enorm. Wir liegen insgesamt sehr gut, denn wir haben jetzt schon etwa 45.000 Jobs mehr als vor einem Jahr und sind auf dem Weg zur Voll-

beschäftigung. Ich bin überzeugt, dass bis zum Ende dieser Legislaturperiode noch einmal rund 100.000 Jobs hinzukommen, wenn wir im Bildungsbereich die entsprechenden Voraussetzungen schaffen. Wir arbeiten in diesem Bereich sehr eng mit dem Leiter von Hagenberg – übrigens eine exzellente Fachhochschule – zusammen. Ich könnte mir Professor Buchberger sehr gut als Regierungsbeauftragten für den Teilbereich Bildung vorstellen. Die Bildungschancen müssen voll aus-

heit, denn ich habe daran mitgewirkt, jetzt können wir jedoch einen Schritt weiter gehen. Zum ersten Mal ist die Nabelschnur zwischen der Politik und den – in den meisten Fällen muss man schon sagen ehemaligen – verstaatlichten Betrieben durchtrennt. Der Finanzminister und die Bundesregierung haben zehn Kapitalvertreter ernannt, die zu den Besten gehören, die sich heute in einem Aufsichtsrat versammeln können. Die für eine Privatisierung in Frage kommenden Betriebe

sollen nach professioneller Vorbereitung an die Börse gehen. Selbstverständlich können sie auch zu 100% verkauft werden, vorzugsweise in einem „going public“. Besonders bei der Telekom, der Post und den damit



schöpft werden, denn tausende Jobs liegen geradezu auf der Straße. Natürlich wollen wir auch – wenn notwendig – qualifizierte Mitarbeiter aus Mittel- und Osteuropa nach Österreich holen. Möglichkeiten für Spielräume innerhalb der Quote stehen zur Verfügung. Ohne Frage muss es mehr Offenheit geben, da ein Schneeballeffekt im positiven Sinn für den gesamten Arbeitsmarkt zu erwarten ist.

Ein Bereich, der vor allem in Zusammenhang mit der New Economy wichtig werden wird, ist die Börse in Wien. Die Frage der Privatisierungen ist ein Thema, das wir gleich zu Regierungsbeginn angegangen sind. Jene, die mich kennen, wissen, dass ich schon seit vielen Jahren als Wanderprediger in Sachen Privatisierung und Entstaatlichung auftrete, aber wir hatten nicht immer die Möglichkeit, unsere Vorstellungen so umzusetzen, wie wir es gern gehabt hätten. Ich stehe zu den Kompromissen der Vergangen-

zusammenhängenden Teilbereichen macht sich der Stillstand und der Zeitverlust während früherer Jahre negativ bemerkbar. Hier sind wir leider nicht in der Spitzengruppe Europas, sondern eher am anderen Ende. Das neue Telekom-Management hat aber mein vollstes Vertrauen, weil es mit sehr viel Ambition und Herz ans Werk geht.

Ein Thema, das mir noch Sorgen macht, ist die Verkehrsfrage, vor allem die ÖBB. Es sollte uns hier eine ähnliche Entwicklung gelingen wie bei der Telekom. Denn letztlich macht es auch in diesem Sektor keinen Sinn mehr, nationale Strukturen zu konservieren. Auch hier schreit eigentlich alles nach Kooperation, nach Partnerschaften mit wechselseitigen Beteiligungen. Vor allem aber sollte der Markt für Private geöffnet und mehr Wettbewerb eingeführt werden, womit auch eine Reduzierung der derzeit gewaltigen Kosten für die öffentliche Hand einhergehen würde. Das Verkehrs-

system, das – ich wage es zu behaupten – nicht unbedingt Topleistungen bringt, verschlingt weit über 40 Mrd ATS aus dem jährlichen Budget; das ist eine gewaltige Belastung. Gerade die Verkehrsinfrastruktur birgt ein enormes Potenzial für Standortentscheidungen im 21. Jahrhundert in sich. Eine rein nationale Sicht scheint mir dabei zu eng zu sein. Größere Räume, wie etwa Ostösterreich, die Slowakei und Westungarn, sind im Auge zu behalten. Man muss heute in Achsen wie Berlin, Prag, Wien denken, und das ist mit nationalen Investitionsplänen, mit nationalen Strukturen nicht mehr oder jedenfalls nicht perfekt abfederbar.

Ein Bereich mit zukünftiger Bedeutung für die Finanzanlagen ist das österreichische Spezifikum der Abfertigung. Als Erklärung für die ausländischen Zuhörer: Wer lange in einem Betrieb beschäftigt ist, bekommt quasi eine Treueprämie, die bis zu einem Jahresgehalt ausmachen kann und die bei Beendigung des Dienstverhältnisses ausbezahlt wird. Allerdings: Wer selbst kündigt, bekommt nichts, nur wer gekündigt wird, kommt in den Genuss der Abfertigung. Der Effekt: Die eine Hälfte der Arbeitnehmer bekommt nichts, während die andere Hälfte satte Zusatzbonuse lukriert, die aber de facto das Entste-

hen einer betrieblichen Altersvorsorge, eines zweiten Standbeines, nicht möglich machen. Eine behutsame Änderung steht daher wohl außer Streit. Hierin steckt nicht nur ein gewaltiges Potenzial für die Kapitalmärkte, eine Reform eröffnet auch die Chance für ein sozial wesentlich gerechteres und besseres System. In diesem Zusammenhang gilt es sicher auch, die Rahmenbedingungen für die Nutzung von Stock Option Plans optimal auszugestalten, wobei weniger die Frage der Höhe eines etwaigen Steuerfreibetrags entscheidend sein wird als vielmehr die Frage des Zeitpunktes der Besteuerung.

Ich hoffe, ich konnte Ihnen einen Überblick darüber geben, dass wir außer den Maßnahmen oder Sanktionen der EU-14 gegen uns auch noch andere Themen haben. Die wirkliche Diskussion um Österreichs Zukunft findet in der Innen- und vor allem in der Wirtschaftspolitik statt, und daran werden wir auch letztlich gemessen werden. In diesem Sinn danke ich der Oesterreichischen Nationalbank für die Einladung. Ich weiß es zu schätzen, dass ich der Crème de la Crème der österreichischen und internationalen Wirtschaftspolitik eine Interpretation der Ziele der österreichischen Bundesregierung aus erster Hand geben durfte. ☘

28. VOLKSWIRTSCHAFTLICHE TAGUNG 2000



DER OESTERREICHISCHEN NATIONALBANK



BERNHARD FELDERER



Why do long-term economic trends in the U. S. differ from those in Europe?

Introduction

The figures in the annex show the difference in the productivity and growth trends in the U.S. and in Europe during the after-war period. Increases in labor productivity have been substantially higher in Europe till the end of the 1980s. Since then, the average productivity increase in the U.S. has been larger.

In the public discussion and literature several reasons have been suggested to explain the observed phenomenon. The most prominent one is the emerging New Economy. However, it is not at all clear what the notion New Economy means in this context. Sometimes authors seem to include structural changes or the evolution of U.S. institutions in this notion. This would include the increased flexibility of markets, etc. Another hypothesis is a causal relationship between capital influx in the U.S., increases in stock prices, consumption, and productivity.

This short paper will make an attempt to evaluate these hypotheses in order to explain the differences

between the productivity increase in the U.S. and that in Europe. I will also suggest an alternative explanation.

First

The first hypothesis to be scrutinized is the argument, that the reason for differences in productivity increase is the emerging New Economy. There is little doubt that the productivity increase in the 1990s in all sectors of the American economy was to some extent caused by applica-



tions of new technologies in generating and processing information. The steady improvement in computer hardware and the infinite differentiation of software must have had productivity effects.

The problem with these fascinating developments, especially in industrialized economies, is that they should explain the difference between the productivity trends in the U.S. and those in Europe. If we look at statistics that might indicate the importance of the new information technologies for productivity change, we discover that the difference between some European countries, such as Norway, Sweden, Germany, etc. and the U.S. is much smaller than expected. We see that computer density e.g. in Norway is higher than that in the U.S. Business to business contacts via internet are less important than in the U.S., but current growth rates of 100 to 200% p.a. are expected to continue during the next years. Business to

consumer relations also seem to be less developed in Europe than in the U.S. However, it is hard to believe that these differences should be responsible for the productivity lag of European economies. It seems unlikely that average lags in the application of information technologies of probably no more than 3 or 4 years can cause the differences that were found in the productivity progress.

Second

Another explanation is the idea that net capital flows to U.S. stock markets of 2 to 3 percentage points of GDP per year in the second half of the 1990s have helped to increase stock prices and build up a bubble, particularly in the New Economy. This contributes to the illusion of American households that their wealth has increased. Consequently savings are reduced and consumption is increased up to the point where the savings rate of current income is zero or even negative. It is not clear how this increase in demand is related to productivity growth. However, empirical findings show that a higher growth rate is correlated with a higher rate of productivity increase.

This hypothesis seems more conclusive than the first one because flows of foreign capital to the European stock markets were much smaller, even though stock price increases in the New Economy sector were similar to the NASDAQ market development.

We observe a lower elasticity of consumption demand with respect to stock price changes in European countries. This difference might derive from the fact that European households are much less dependent on stock prices to secure their old age income and, therefore, aggregate consumption is hardly influenced by

stock prices. If the increase in U.S. demand has increased productivity, then this would explain at least a part of the differences in productivity increase in the second half of the 1990s. But how could a high productivity growth in the first half of the 1990s result from very small or negative net capital inflow to U.S. stock markets? Apparently capital influx could have helped U.S. growth only at a later stage of the cycle.

Third

The productivity gap could also be due to more deregulation and flexibility in U.S. markets, in particular the labor market. This argument needs to be examined more closely by looking at the entire post-war period. The economic policies in European countries during the post-war period were characterized by corporatist structures. Contrary to what one would expect, this collaboration between both social partners and the government helped to adjust the heavily regulated markets to external shocks. This turned out to be the case, especially for the labor markets of smaller European countries. With increasing globalization during the past decades, it seems as if these structures were no longer the most efficient institutional arrangement.

In the 1960s, 1970s and 1980s, Europe was taking advantage of the fact that a European division of labor was reestablished, and the economies were able to increase their productivity faster than the U.S. economy, although at a decreasing rate, by improving the European allocation of resources and taking advantage of economies of scale. The economic and political integration in Europe necessarily had an important positive effect on productivity. There was no similar development in the U.S. Many authors dealing with this sub-

ject in the 1960s and 1970s did not only stress the improvement of the allocation of resources throughout Europe, but also within each individual country. This was especially true for the reallocation of labor from agriculture to industry and services, which (see e.g. Edward F. Denison. *Why Growth Rates Differ*. The Brookings Institution, 1967) again was not a feasible strategy for the U.S., since employment in the agricultural sector was already much lower at that time.



In the 1970s and 1980s internationalization and globalization increasingly dominated the internal adjustment of institutions and economic policies in the European countries. In the 1980s the European discussion centered around what was then called “eurosclerosis”, i.e. a much denser regulation of European markets compared to the U.S. The same adjustment pressure later named “skilled biased technical progress,” which increases the demand for skilled labor and reduces the demand for unskilled labor, leads to unemployment in Europe and to a larger inequality of wages in the U.S.

One may either prefer the European or the American way to cope with the challenge of globalization and technological change. Obviously there is a value judgment involved. However, we cannot deny that the European way reduces the growth of productivity and average per-capita income with respect to the potential growth path.

Fourth

The above explanation is related to another hypothesis that might also explain the high productivity increase in the U.S. during the last 10 years. It seems, in particular, as if business cycles have changed over the last 100 years and during the last two decades. An increasing amount of scientific literature in America is considering the question of whether the amplitudes of business cycles have declined during the last century. Most of the studies distinguish three periods: The time before the First World War and the period in between the two World Wars, and the period after the Second World War. Due to the Great Depression in the 1930s, the volatility of business cycles in the inter-war period was much higher than during the other two periods. Studies by M. N. Baily (1978), N. S. Balke and R. J. Gordon (1997), J. Bradford De Long and L. H. Summers (1986) have shown that, compared to the period before the First World War, the business cycle volatility in the period after the Second World War was only 25 to 50% of the volatility of the earlier period. Christina D. Romer (1986, 1989, 1991, 1999) comes to the same conclusion in a series of papers, in which she also examines carefully the origins of the data used in these studies. Although the difference between the two periods is smaller in her time series, she presents similar results. She also finds that the sub-period between 1948 and 1984 only shows a somewhat smaller volatility than the period before the First World War, while during the period between 1985 and 1997 the volatility was reduced by approximately one half. In an appendix to this paper international panel data from 1870 to 1989 are used to compute the volatility of growth rates of per-

capita GDP in a lot of different countries. The results support the hypothesis of decreasing volatility not only for the U.S. but they show that this is a general phenomenon. The appendix also uses OECD data to scrutinize the period after the Second World War. The data clearly demonstrate a reduction of the standard deviation of growth rates of the per-capita GDP from the period of 1948 to 1984 to the period of 1985 to 1998. The selected European countries and the U.S. show a similar result. However, the reduction of volatility in the U.S. is stronger than the average reduction of volatility in European countries. The effects of the German unification are at least partly responsible for the nearly unchanged volatility in Germany between 1985 and 1998.

As we try to explain these observations, we get rather disappointing answers. Christina D. Romer thinks that the decline of volatility is not a result of structural changes, globalization, etc., but that it may be explained by a steady improvement of macroeconomic policies, especially during the last 15 years. I am not convinced that this is a satisfactory explanation. As apparently all the surveyed countries have reduced their volatility during the last 100 years and during the period after World War II in particular, we should have had a similar increase in the quality of decision-making with regard to the economic policies in all these countries. Given the different traditions of fiscal and monetary policy in different European countries and in the U.S., this hypothesis seems highly implausible.

The phenomenon should rather be explainable by the learning processes of the participants in different markets, which in turn leads to an

improvement of the information they need in order to make decisions. As we look at a cross-section of countries, we find that the lower the level of per-capita income is, the higher is the volatility in each market. The volatility in developing countries is higher because myopic behavior is still dominating. The formation of expectations in such countries is rather static and learning still slow. In a development process the information set on which decisions are based increases and agents learn to use it efficiently. Thus expectation comes closer to what theory would call “rational expectation.”

Back to the difference in volatility between the U.S. and Europe: A decline in volatility means that recessions are avoided and the economy is kept longer and closer to its capacity path. This is what explains best the differences in economic and productivity growth between the U.S. and Europe. The phenomenon of market participants’ learning can be observed in many ways. Take for example the reaction of households and investors to declines in stock prices in the U.S. It is evident that these elasticities have become smaller over the past decades. This is an important fact because in great recessions, such as the one in Europe in 1873, or the global recession in 1929, the reaction of shareholders and investors to a stock price decline was an important “link” in the chain of causality leading to these recessions.

R. Lensink, H. Bo and E. Sterken (1999) have demonstrated, using a panel 1977 to 1995 of countries, that uncertainty defined by different proxies will have a negative effect on the growth of per-capita income. Market participants’ learning generates more information and allows a more efficient use of them, which reduces uncertainty.

Conclusion

I have presented four hypotheses, three of which seem to be able to explain a part of the productivity or growth difference between the U.S. and Europe.

Capital influx, however, could only explain additional growth after the third year of the boom in the eighties and particularly in the nineties. Though capital influx cannot be responsible for a successful start of the business cycle, it could have contributed to sustain the excellent performance of the American economy in the second half of the nineties.

There is little dispute in the profession that deregulated markets, in particular the labor market, are important factors in explaining the differences between the U.S. and Europe. Obviously, adjustment to any kind of shock is faster and less costly. The actual growth path will be closer to the potential path.

The last hypothesis, which is linked to the previous one, emphasized a decline in volatility over the last century and in particular over the last 15 years. This is true for all markets though it was demonstrated only for the volatility of per-capita income. The computed standard deviations of per-capita income (see annex) decline more for the U.S. than for the average of European countries. Thus, though the phenomenon of declining volatility can be observed universally, it also offers a good explanation for the different trends in these global areas. A decline in volatility means that recessions are avoided and the economy is kept longer and closer to its capacity path.



Given a policy-oriented audience I have tried to present my ideas in a nonformal way with enough stylized facts to support them. Obviously, an exercise to implement these ideas in frameworks of existing models is possible and should also be worked out. The cases of capital influx and market deregulation should not lead to any surprises. The question how

a learned process by increasing human capital can reduce volatility in a model economy is obviously more challenging. The model should be a stochastic growth model in which the reaction to exogenous shocks are damped over time. I am preparing such a model for another publication. 🐼

Figure 1



Figure 2

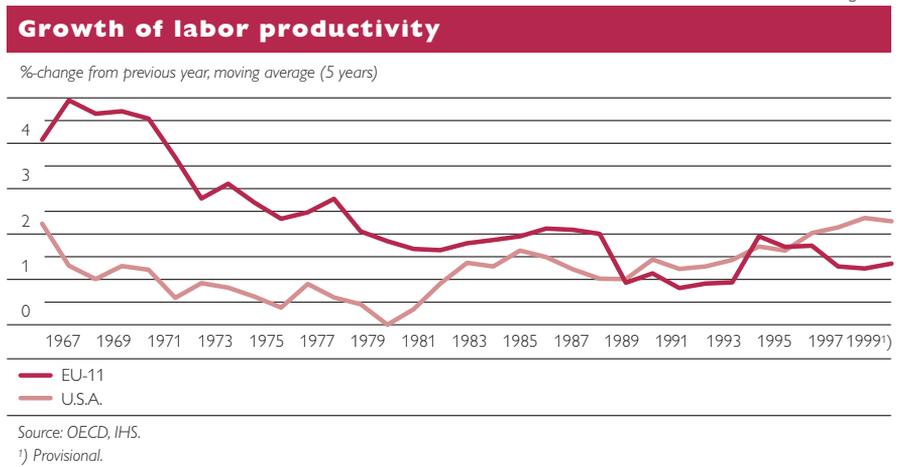
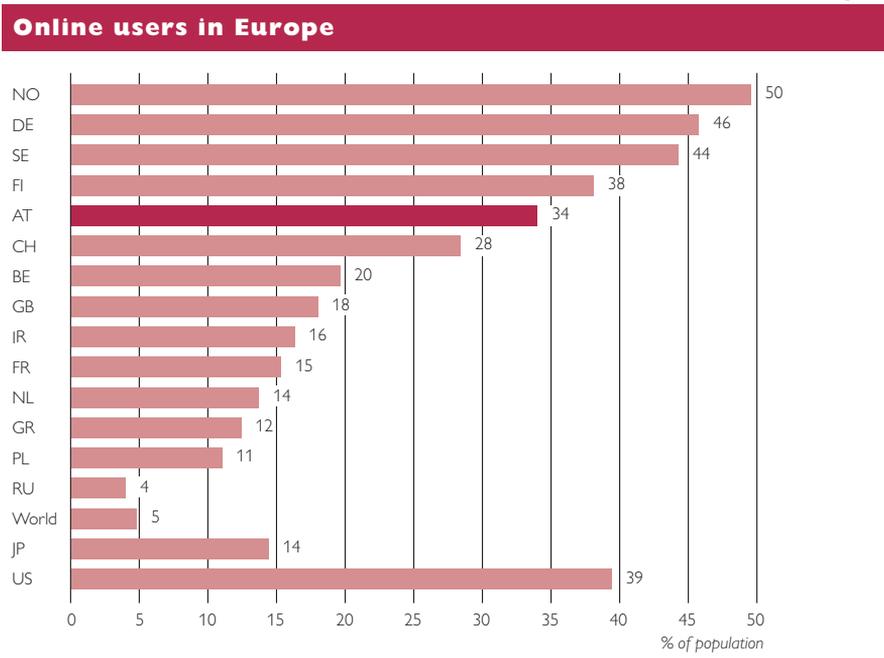
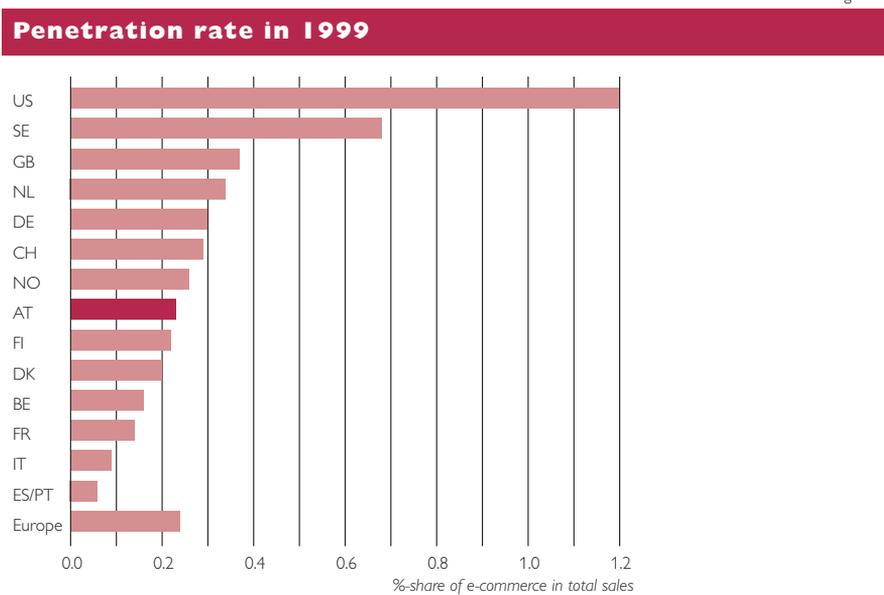


Figure 3



Source: ORF (<http://mediasearch.orf.at>).

Figure 4



Source: Boston Consulting Group 2/2000.

Figure 5

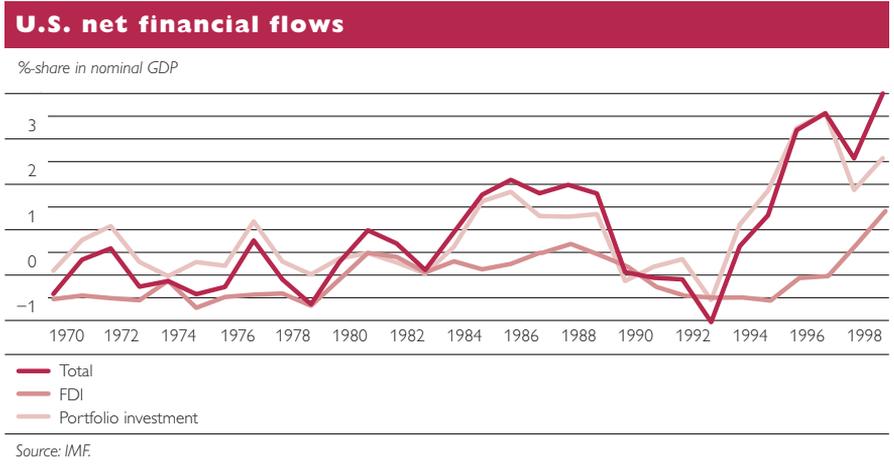


Figure 6

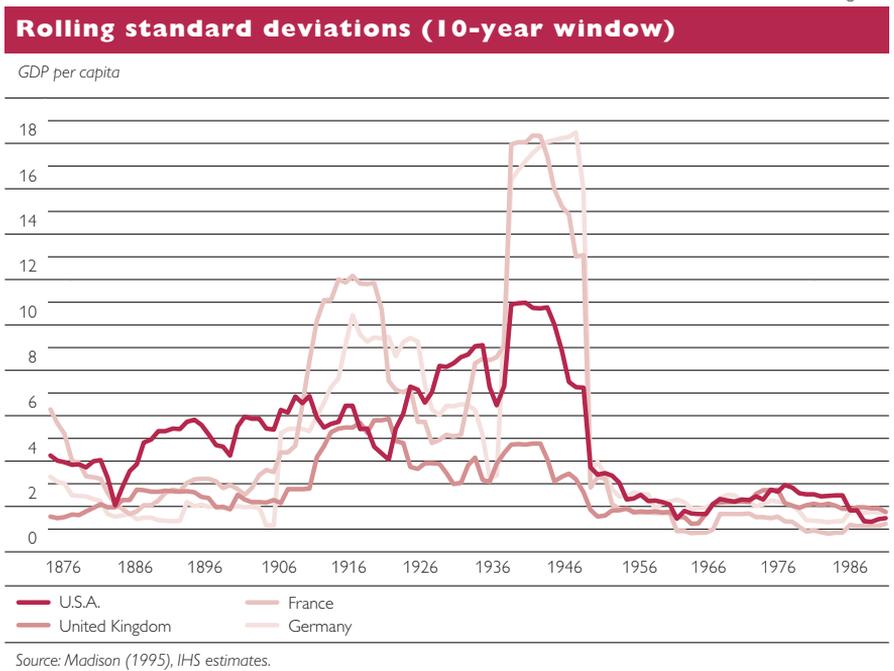


Figure 7

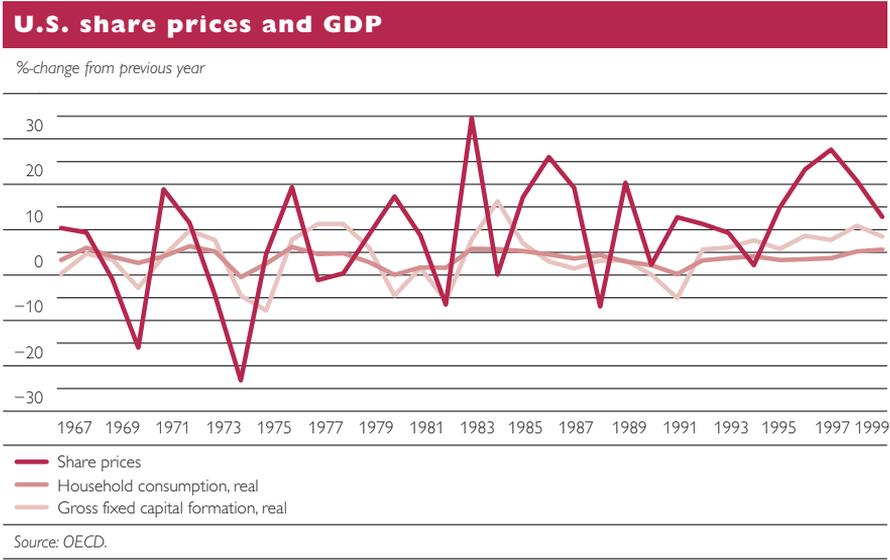
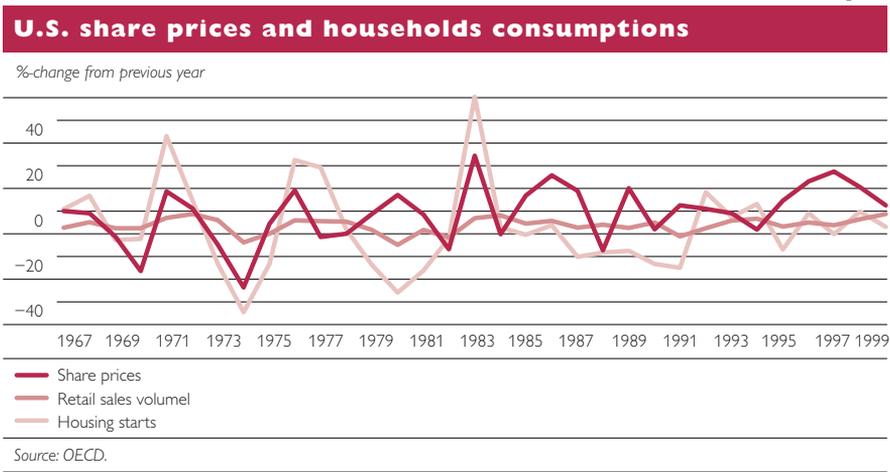


Figure 8



ROBERT J. GORDON



ROBERT J. GORDON
PROFESSOR,
NORTHWESTERN UNIVERSITY

Does the “new economy”
measure up
to the great invention of the past?

Thank you I am delighted to be here. In this limited time I can only give you a brief overview of some of the main points of this very long paper that was circulated to the discussants and is available to everyone on my website (<http://faculty-web.at.northwestern.edu/economics/gordon/>). However, there is a much simpler way besides listening to me now to get the overall view of this topic. I want to thank my friends at the London Economist who have devoted two consecutive weeks of their economics focus page to the debate about the “new economy.” I was so eager to see the second installment of the economics focus, I knew the Economist comes out on Thursday night, so I was up late in my hotel room on the web downloading the page from the Economist which turns out to be entirely about today’s paper which you are going to hear about.

Despite the skepticism that I will conclude with about the usefulness of the Internet, you can see that I am somewhat hypocritical because I

was up quite late last night using it. Now you can judge for yourself whether this increased or decreased my own productivity.

The U.S. economic miracle which we have been hearing about is a source of pride at home, of envy abroad and a puzzlement for economists. Where did it come from?

In the superficial view, it came because the Federal Reserve was very patient in allowing unemployment to fall to the lowest level in 30 years. The Fed had a policy you



might call “benign neglect”: Until a few months ago short-term interest rates were the same as they had been five years earlier despite a decline in unemployment from 6 to 4%. Long-term interest rates were considerably

lower and still are considerably lower than they were five years ago.

Underneath of it all is the apparent demise of two hallowed economic relationships, the Phillips curve and Solow’s paradox. The Phillips curve, which calls for an acceleration of inflation as unemployment declines, has either been overturned or its operation has been temporarily postponed by a series of beneficial supply shocks. Indeed one of these supply shocks is the “new economy,” in the form of an acceleration in the decline in computer prices, and this is not temporary like most shocks but rather permanent in nature. There is now a consensus that the enormous rate of price decline in computer hardware is reducing the rate of inflation in the United States by a full half percentage point per year.

The other relationship that is more clearly obsolete is the Solow computer paradox, which the great Robert Solow enunciated in 1987.

It goes like this: “We can see the computer age everywhere except in the productivity statistics.” Prof. Solow has been quoted by the New York Times as declaring his own paradox to be obsolete. I was one of many economists struggling to explain the Solow paradox only to find that it slipped out from under me and that there was nothing left to explain. We are going to see today however that there is still quite a bit of a paradox left if we look closely at the statistics.

First let’s just review some of the amazing numbers about productivity growth. During the dismal days of productivity slowdown, the U.S. registered a growth rate of a non-farm productivity of 1.42% per year. In the four years ending at the end of 1999 that had virtually doubled to 2.75%. In the last half of 1999 the rate of growth of productivity was an amazing 5.5%, something no one would have believed possible even two years ago.

As a result of these figures, there has been a sense of euphoria not only in the stock market but in the media that cover economics in the United States, especially Business Week. And these are typical quotes: “We have the reality of the productivity revolution,” “the argument has quieted whether there is a productivity revolution,” “there is a deep-seated shift in the economic landscape,” “perhaps workers are even doing something productive online” (a revolutionary thought which I will question somewhat later), “the Internet age and the computer chip have together been described as an industrial revolution equal in importance to the invention of electricity and the internal combustion engine” (a thought that I will also question in a little while).

There happen to be three complementary papers floating around

in the United States. Two of them – mine and the paper by Oliner and Sichel – will be published in the *Journal of Economic Perspectives* in the fall of 2000. The other paper is by the famous economist Dale Jorgenson and Kevin Stiroh (2000) that was published in the *Brookings Papers* very recently. This is an incestuous business: We all discuss each others' papers. So you will find that the two discussants in the *Brookings Papers* are Sichel and me. In fact all these other papers, e.g. Jorgenson and Stiroh (2000), Oliner and Sichel (2000) and the *Economic Report* (February 2000), all have in common that they look at that set of statistics I just described for actual productivity growth in the last four years and they interpret it and decompose it without stopping to think that some of it may not be sustainable, the topic I want to talk to you about. So the lack of attention in most of the long historical literature to cyclical behavior of productivity is really the topic of the first part of my talk.

Let me show you the kind of econometric relationship that comes out of the following experiment. We are going to relate two different variables to each other. The dependent variable is the change in the growth of hours, i.e. labor input, relative to its trend. This is the cyclical movement of change in hours around its trend: obviously rapid when the economy comes out of recession and negative when the economy is going into a recession. The independent variable is the ratio of output to its trend. And the coefficients relating the hours deviation to the output deviation show that output hypothetically moves up 1% relative to its trend, hours also grow but they grow with a lag and they do not grow one for one. Hours grow by about three quarters of 1%

when output grows 1% faster than its trend.

As a result, productivity shows two different kinds of cyclical movement. First of all, because of the lag in hours productivity shows a temporary bulge as output is growing rapidly and then sustainably productivity grows by one quarter of 1 percentage point for every 1% that output has grown above trend.

So it is from this past econometric evidence quite plausible that in that past boom period of the U.S. economy we would have at least some cyclical component as a result of this unprecedentedly rapid growth in output, particularly in the last half of 1999 when output was growing at a 7% annual rate.

To hear some of the reasons why there must be some kind of cyclical component to American productivity performance, let me pick out one: Output growth averaging 7% in the last half of 1999 was faster than even the most optimistic estimates of potential output growth. The most optimistic business forecasters have a potential growth of 4% and people inside the U.S. government more like 3½%.

Unemployment fell during the last four years from 5.6 to 4.1%. Of course, that cannot go on forever. Unemployment cannot be zero or negative. The growth in hours in the non-farm private business sector was 2¼% in the last four years compared only 1.1% for the civilian working age population. Again hours grew much faster than anything that is sustainable in the long run. If unemployment stops falling as it already has in the most recent months, output growth will return to the growth of potential output by definition; the Administration in



its own economic report (the same report that ignores cyclical productivity effects) is forecasting that unemployment in the United States will rise to 5.2% from 4.1% in the next three years, so again output will grow slower than its potential rate. All of those are reasons to think that some part of the U.S. performance is transitory rather than permanent.

To throw a little cold water on the importance of the revolution in the entire economy, a remarkable



part of this productivity performance has been concentrated in durable goods manufacturing, which in the United States is 12% of the private economy. In the “golden age” (1913 to 1972) durable productivity growth was only 2.3%, in the miserable slowdown period it actually accelerated to 3.1%, so there never was a slowdown, and then at 7.7% in the last few years. It is important for everyone in this room to realize that the United States is one of the few countries that uses a hedonic price index for computers that in the last four years has been declining at a rate of 30 or 35% a year and all of that computer manufacturing is concentrated in durables. So this huge rate of decline of computer prices translated into a huge rate of increase in computer speed and memory, the characteristics of computers. This is what lies behind between a third and a half of this remarkable productivity growth in durable manufacturing. If you do not see that in your statistics for Austria and Germany or France this is most likely because either you are not manufacturing computers in the same way or you do not have a hedonic price index.

The results of the study can be summarized by slicing apart the acceleration of productivity in the entire economy into about 6 pieces. If we compare the acceleration in the last four years compared to the period of the previous 23 years that acceleration is 1.3%. We are now going to decompose this acceleration into several pieces: the component that I estimate to be cyclical movement that is connected with the above-average growth in hours and output during this period is about 0.5%, so that explains a little more than a third. There are some technical issues in the way in which the U.S. government measures prices: it is not completely continuous, it is better than it used to be, but there is a very small component of about 0.1% of improved price measurement that has reduced inflation and raised output growth. There has also been a slight acceleration in the growth of labor quality or composition. The 1970s were a period when we had a big increase in the share of teenagers in our labor force that had the effect of pulling down productivity, that has now gone away and has contributed to some productivity acceleration, the so-called “demographic effect”.

So what we have left is the structural acceleration, the trend acceleration in labor productivity, more or less half – a little less than half – of the actual acceleration.

Now where did that come from? Probably it comes from capital deepening, i.e. the acceleration in the growth of capital relative to labor input. All of that has been contributed by computers and semiconductors, none of it by other types of capital, nothing by trucks, trains, structures or any other kind of equipment.

So what is left when we take out all of these contributions? We

actually have a deceleration in the trend in non-computer multi-factor productivity. We can do the same exercise in another way, which is simply to look at the part of the economy outside durable manufacturing. If we do the same exercise we got an even bigger negative result.

The paradox of my work is that most of the computers are going into the economy outside of durable manufacturing. There has not been a pay-off to this investment in the official productivity statistics and so Solow's paradox is alive and well for the 88% of the economy outside of durables.

Are these cyclical estimates unprecedented? Productivity is currently running 2% above trend, i.e., that is the total cumulative growth above trend in the last four years. That ratio of 2% is not higher than it was in 1992, 1973, or 1966. It is not an unprecedented estimate.

Looking back over a broader historical view, we have the following phenomenon to the United States up until the mid-1990s going back to 1876, the year that Prof. Felderer used to talk about output volatility. We had a period of slow multi-factor productivity growth from 1876 to WWI, then a period of rapid growth of multi-factor productivity from about 1915 to 1965, and then slow again from 1965 to 1995. So this historical phenomenon for the U.S. looks like one big wave (this is the title of a paper I have written on this longer historical period). For Europe that big wave was all concentrated in the post-war period of 1947 to 1973. It was compressed as many of the great inventions that were first used in the United States were introduced in Europe, think of the timing of the building of highways and electricity and home appliances, to remind yourself of that.

Our standard of living was really changed by the major inventions of the late nineteenth century, which I've grouped into five clusters. First is everything to do with electricity, i.e. electric light, electric motors, household appliances. Second is the internal combustion engine, which made possible motor transport, automobiles, and air transport. The third I call re-arranging molecules, i.e. everything that has to do with plastics, petrochemicals, pharmaceuticals. The fourth is communications and entertainment which occurred over a long period of time, all the way from telegraph through television. All of those had a direct effect on productivity. The fifth had a very big effect on consumer welfare, this was the invention of indoor plumbing and the development of urban sanitation infrastructure which also can be dated to the same period of the late nineteenth century.

I have what I call the honor roll of great inventions and if we really want to look at the great inventions, look at the greatest decade in human history for inventions: 1876 to 1886. If you think the last decade has been dynamic, it does not measure up to 1876 to 1886: electric light, electric transformer, electric railway, power station, internal combustion engine, automobile, dirigible, telephone, motion picture camera, phonograph, vending machine, linotype, roll film, fountain pen, dictaphone, cash register, germ theory of disease and last but not least the indoor flush toilet. That is the greatest decade in the history of invention.

How does the computer compare? The biggest single difference between the computer and some of the great inventions like electricity



is that there was no precedent in the past to the incredibly rapid rate of price decline that we observe with computers. So imagine a fixed demand curve with the supply curve falling at an unprecedentedly rapid rate for computers. That means we are going to ever lower marginal utility uses of computers as the price declines. Your computers are sitting idle on your desk while you are listening to me. All of that power in your computer is not being used right now. The mainframe computers thirty years ago were being used 24 hours a day. The great high productivity uses of computers to create computerized bank statements, telephone bills, airline reservation systems, credit card statements and the ATM machine were all creations of the mainframe, not of the personal computer nor of the Internet age.

Where does the computer fall short? It is amazing that even in the United States, only 1.2% of GDP is being spent on computer hardware. There are two big reasons why computers cannot replace all human labor.

First of all, there are some jobs that inherently require hand and eye coordination – all commercial aircraft will always need two pilots, all trucks will need at least one driver, in auto factories you will find that there are some things they cannot automate and human beings still put the auto chassis and the body together. Every time I talk about this subject, I am in a hotel and I walk down the hotel corridor to give my talk and I look to the left and I look to the right and I am so relieved the beds in the hotel rooms are still being made by human beings, not by computerized robots. Think of all the different kinds of service occupations that require face-to-face con-

tact between two human beings: doctors, nurses, dentists, lawyers, bankers, management consultants, bar tenders, wait staff, flight attendants and even professors. We can be made obsolete by electronic classrooms but many of those other jobs cannot.

Now the diminishing returns, this idea that we have a supply curve moving rapidly down the demand curve, comes into collision with a fundamental limitation. We have a fixed factor, human time, coming into collision with this exponential growth rate in computer speed and memory, so diminishing returns are pervasive.

I have one example which you will immediately think to be an old-fashioned example but I will update it in one minute. Here is my vision of the development of computer word processing. We had the first invention in the late 1970s, that was the memory typewriter, that was the biggest productivity invention of all, no longer did rows and rows of secretaries in legal firms endlessly have to retype briefs or secretaries in economics departments type endless revisions of papers. So there were no megahertz, no speed in the memory typewriter, so we have it at point a) on the zero horizontal axis, we are plotting megahertz against the total utility from word processing. Then we had the first round of personal computers, WordPerfect 4.2, we get up to point c) with WordPerfect 6.0 for DOS – that is where I stopped, I still use it – that gave me everything I needed. And then you noticed my rather biased views, the improvement in total utility contributed by Windows and movement to Microsoft Word that was a very small increase in utility, some people think it is negative. I am happy to report by the way that the Nobel prize win-

ner Robert Solow still uses Word-Perfect 5.0 for DOS. He is one generation behind me. If you take the marginal utility of word processing of course as I have drawn it, you have a slowing rate of decline of marginal utility eventually even flattening out.

You might say this is an old example. What about the Internet? Let's talk the 1990s. Isn't the web a monumental once in a century invention? Well, I beg to differ. I think there are a lot of things about the web most people do not realize. First of all, much of consumer e-commerce is simply substituting for mail order catalogues but the mail order catalogues still exist and at least in our mailbox at home we still get 10 to 20 mail order catalogues a week and the use of paper is going up, not down.

One estimate by the Wall Street Journal is that only 6% of sales on the web are new, i.e. the other 94% are substitutes for existing forms of commerce. So for all of the people, many of them in this room who buy books from Amazon or the other e-commerce booksellers there are clerks in Barnes and Nobles standing around with nothing to do. That is one of the explanations of why the web is not more productive.

What about business-to-business e-commerce? Management consultant, friends of mine that are experts in the so-called supply chain, tell me that this is a continuation of the movement to computerization, the shrinkage of inventories, the increase in efficiency that goes back at least 20 if not 40 years that is merely the latest version rather than a revolution.

Now what are the most frequently visited websites? Except for Amazon and e-bay the most frequently visited sites are for entertainment. So we have a substitution

from time spent looking at television or doing outdoor activities into web-based entertainment. My favorite example of a second-rate invention is the VCR. The VCR combined a first-rate invention, motion picture with another first rate invention, the television set. The VCR is simply a combination, it does not have the impact on the invention of either of those two. I like the Internet to that kind of thing rather than something genuinely new.

And then we have the killer point, the point that is really important and that is all the surveys will show you that the use of the popular consumer-based websites peaks in the middle of the day, e-trading, e-commerce, you name it, people are doing it at the office. Many firms are being established to create web surveillance software so that the business firm can keep track on what the employees are doing with their computers.

It is very appropriate that a talk about this topic ends with two cartoons. I used to have only one cartoon but I keep collecting more. The caption on this cartoon is: "I like to believe we are redefining the way future generations will waste their time." And the best cartoon of all on this topic actually is now about three or four years old. I cannot imagine there is anybody who has not seen this one: "Economists wonder why computers are not raising productivity," we see four people at the office, one is downloading new web fashions, one is playing space combat, one is e-mailing a high-school boyfriend, and the last one is bookmarking "babes of the web." I rest my case. ☹️



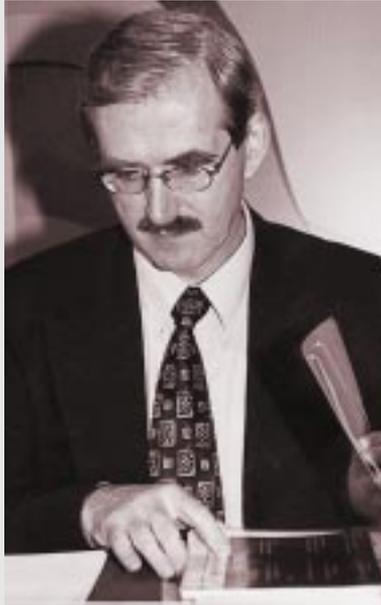
References

Oliner, S. D., Sichel, D. E. (2000). The Resurgence of Growth in the Late 1990s: Is Information Technology the Story? Board of Governors of the Federal Reserve System. In: Finance and Economics Discussion Series, No. 2000–20.

Jorgenson, D. W., Stiroh, K. J. (2000). Raising the Speed Limit: U.S. Economic Growth in the Information Age. In: Brookings Papers on Economic Activity, 31:1, 125–211.



FRANK BROWNE



Discussing
the papers
of Gordon
and Felderer

I think Professor Gordon has provided us with some very interesting insights into the amazing phenomenon, which we are now witnessing in the US, which some are calling, perhaps somewhat prematurely, a New Economy. Professor Felderer has put forward some interesting hypotheses as to why Europe does not seem to be participating in this productivity acceleration.

In commenting on these papers I would seem to be a victim of one of the laws of the New Economy which Gordon mentions in his paper, namely: “A wealth of information creates a poverty of attention”. Given the limited amount of time available to me to comment, I can only devote what is a poverty of attention to the wealth of information contained in these two papers. They deserve much more attention than I can devote to them. I will therefore unavoidably have to be selective in

my comments. And most of my remarks will be set in the context of the type of discussion relating to the New Economy that has been conducted at the ECB. I will direct most of my initial remarks to Gordon's paper and will comment on Felderer's paper towards the end of my remarks.

Despite the fact that the rigorous statistical evidence available to date gives only a mixed picture relating to the existence of a New Economy in the US, and that there is in any case only a limited availability of quality data on the basis of which to make any kind of robust inferences, financial markets have nevertheless voted unanimously in favour of the New Economy. One would have to conclude that this is the case since current stock prices can only be rationalised by very optimistic future growth scenarios. And despite Alan Greenspan's earlier cautions against "irrational exuberance", he has been quite sanguine in his comments about the New Economy in recent times, saying: "The best I can say to you is that it is certainly true that we have a new economy. It is different. It is behaving differently and it requires a different type of monetary policy to maintain its stability and growth than we did in the past".¹)

It has become somewhat fashionable to indicate that one is not taken in by all this hype about the New Economy. This typically involves telling cautionary tales about similar predictions of new paradigms in the past. Let me instance two of these. One relates to the fact that the US Commerce Department dropped the title "Business Cycle Developments" from one of its publications in 1968. Another relates to state-

ments made by Irving Fisher, probably the greatest economist of his day, back in 1929 when he said: "We are living in a new era, and it is of the utmost importance for every businessman and every banker to understand this new era and its implications", and that: "stock prices have reached what looks like a permanently high plateau". And these statements were made just on the eve of the stock market crash in 1929.²)

As already noted by many speakers already at the conference, there is as yet no generally accepted or parsimonious definition of the New Economy. Robert Gordon has a very precise definition: "As a shorthand, we shall take the New Economy to be synonymous with an acceleration in (the) rate of technical advance in Information Technology ...". My own preferred definition relates instead to features of the aggregate macro economy itself rather than to technology – three features are isolated for attention.

1. A permanently raised potential growth rate of the economy (using the 1970s, 1980s and early 1990s as a benchmark) attributable predominantly to the revolution in the Information and Communications Technologies (ICT);
2. The second feature is a permanent reduction in structural and frictional unemployment to which it is argued the ICT also contributes through a number of channels;
3. The third feature is a permanent reduction in the variation in the growth rate of output in the 1990s, and possibly to some extent in the 1980s, relative to previous decades.

¹ Humphrey-Hawkins testimony before the Senate Banking Committee on February 23, 2000.

² Irving Fisher: "Booms and Depressions", October 23, 1929.

Although an important phenomenon in its own right, the reduced variability in growth rate of output could be seen as making its biggest contribution to the New Economy through its effects on the first feature above, i.e., the permanently raised growth rate. This is because a permanently reduced variability of output would encourage increased long-term investment arising from both a reduction in the risk premium in long-term real interest rates and also reduced uncertainty about future cash flow from investment. The New Economy could therefore be summarised in terms of the first two features mentioned above. Accordingly, a more synoptic definition might be that the New Economy is one which can operate at higher rates of growth than in the past without generating an acceleration of inflation – i.e., an economy in which the speed limit has increased.

According to the Gordon definition, the Nordic countries, which tend to be on top of the list in terms of the production and application of the new information technologies, would have New Economies, but not according to our definition. And indeed there is not much evidence to date of an acceleration in the rate of productivity growth in these countries. Indeed, the evidence on the Nordic countries would also tend to corroborate the view that the New Economy is not just about new technologies but is broader than this.

However, data relating to these three features are not sufficiently plentiful (given the comparative newness of the phenomenon in question) nor of sufficient quality (given measurement problems associated with the increasingly intangible nature of output) to warrant robust inferences about the New Economy in the US. Therefore, on the basis

of an examination of our three defining features of the New Economy, one would have to share the scepticism of Robert Gordon. As he rightly reminds us, there is a large literature on the pro-cyclicality of productivity, i.e., productivity grows unusually rapidly when output grows faster than trend. There is therefore no way in which we can reliably infer from the entrenched perspective of real time that the acceleration in productivity, which we are observing in the US, is not just cyclically related.

Therefore, in endeavouring to make inferences about the existence or otherwise of a New Economy in the US, we take a different tack. Attention is shifted away from the three features which we have identified as the defining features of the New Economy and to the driving forces which theory would suggest might be important in causing a New Economy to emerge. The driving forces which we identify can be assembled under the following five generic headings: firstly, the direct effects of advances in Information and Communications Technologies (ICT) and in particular their impact on inventory management. Secondly, domestic financial market liberalisation and the globalisation of these markets. Thirdly, the globalisation of trade in goods and services and the increased product market competition. Fourthly, increasing flexibility and reduced regulations and rigidities in labour markets. And, fifthly, improved macro-economic management, both monetary and fiscal.

If there are lags between the activation of these driving forces and their outcome (i.e., the New Economy), then the more ample data on



the driving forces themselves would allow one, in principle, to test whether these driving forces have been subject to permanent shifts in the past. If so, then this creates a presumption that the current state of the US economy qualifies as a New Economy. The limited examination, which we have been able to do, would suggest that all the driving forces identified have been subject to permanent shifts over the last few years. This, we think, would warrant a tentative affirmation of a New Economy in the US.

An examination of these driving forces must bring us beyond the growth accounting framework (GAF) which Gordon and others employ in their research. The GAF attributes that part of observed output growth not accounted for by observed (measured) factors of production to a residual catchall, called multi-factor productivity (MFP). It could therefore, in principle, capture a wide variety of phenomena, including improvements in managerial procedures, improved economy-wide co-ordination of production plans, better resource allocation, exploitation of network externalities, etc. In many cases, these phenomena are very difficult to quantify.

A related problem of the GAF is that growth is attributed to contemporaneous changes in factors of production and/or in MFP. In principle, it could take a long and variable amount of time for technological innovation to be transmitted to the overall economy (the Paul David hypothesis). This is particularly so if the influence of the technology operates through indirect channels. If, as I have already suggested, these channels should be considered in a rather broad sense, then the lags

may not only be important but may also vary depending on the channel of influence.

Let me use an example of one of the driving forces, that relating to financial market innovation, liberalisation and globalisation, to illustrate this point. Gordon notes that: "The use of ever-faster computers and peripherals to churn out securities transactions, bank statements, and insurance policies has enhanced productivity growth in the finance/insurance sector". He also notes that "... the computer has spawned inventions whose main output is convenience, most notably the ATM machine". All this is undoubtedly true, but in my view it has done much more than this.

Advances in ICT has reduced the cost of conducting transactions in securities markets. The cost of intermediation through securities markets is now only a fraction of the corresponding cost of intermediation through the banking system.¹⁾ The growing depth, liquidity and flexibility of securities markets are giving them an additional edge on banks in their traditional business of intermediation. Empirical results reported in the academic literature lend support to the idea that financial market deepening (of which the growth in securities markets could be seen as a dimension) contributes to overall economic growth (see, for example, Levine and Rajan and Zinzales, 1998). A related argument, and one that is very apropos to the current discussion, has also been made that financial market deepening and development would improve disproportionately the growth prospects of young, dynamic and risky firms. These firms are typically innovating ones which tend to bring new

¹ See Bryan (1996). *The Risks, Potential, and Promise of Securitisation*. In: *A Primer on Securitisation*. Edited by Kendall and Fishman.

technologies to the market. In other words, the type of firms that contribute mostly to the “waves of creative destruction” noted by Schumpeter. But with a less developed financial system, these are precisely the types of firms that would not tend to get funding. This is because, given the nature of the funding instrument (the bank loan) available to banks, banks will not have an incentive to fund risky projects in the absence of sufficient tangible collateral.¹⁾ Indeed, easier access to venture capital in the US may partly explain the large number of company start-ups there, in particular in “emerging” sectors.

An increasing array of financial products is now available and can be used for insurance against various types of shocks. The liberalisation of domestic financial markets and the progressive integration of these markets internationally (financial market globalisation) have increasingly allowed agents to pool risks both domestically and internationally. These developments have increasingly enabled more effective insurance to be achieved against a variety of risks. The private sector is now in a much better position to cope with shocks to disposable income (in the case of households) and to cash flow (in the case of firms) than was the case in the past. Arguably, therefore, the availability of this insurance is weakening a propagation mechanism that may have been important in amplifying the effects of shocks in the Old Economy.²⁾

I think it is clear that there have been substantial positive benefits to the overall economy from the application of IT technologies in the banking/insurance/securities industries. It is also very difficult to imagine the growth in securitisation and the derivatives market without the application of IT (and subsequently ICT) technologies. These can therefore operate very indirectly through a variety of channels and with conceivable quite long lags. Therefore, although the GAF is a very useful



framework, I think that in the current context of an examination of the likely existence of a New Economy, it has significant shortcomings.

Gordon notes that outside the 12% of the economy engaged in the manufacture of durable goods, the New Economy’s effect on productivity growth are surprisingly absent and the capital deepening that has occurred has been remarkable unproductive.

One possible explanation may have to do with externalities, which characterise the working of networks. One aspect of this is encapsulated in Metcalf’s Law which states that the value of a network goes up with the square of the number of

1 The prototype firm in the services sector of the economy will not typically be in a position to offer collateral to a bank as security for a loan. Therefore the return to the bank from such a loan would be asymmetric in the outcomes of the projects in which the borrowing firm would invest – if the firm is successful, the bank gets paid back the principle of the loan with interest while if unsuccessful it gets paid back nothing. This implies that loan funding would no longer be appropriate for such a firm.

2 Of course, this benign outlook has to be tempered by the fact that globalised financial markets also permit financial crises to be generated and propagated more easily.

its users (see Varian and Shapiro, 1999, for a discussion). This would suggest that, as the Internet spreads, its value (productivity) would go up more than proportionately with the number of users as new users confer additional benefits to existing users. If, as might be argued, some of the substantial benefits of the ICT revolution comes from the networking of computers to supply the economy with an efficient communications network, then this would suggest that most of the benefits of Internet have yet to be seen. We should not lose sight of the fact that connectivity is a rather recent phenomenon, commencing with the Internet in 1995. It may indeed be some time yet before connectivity will have reached a critical mass beyond which the real benefits to the economy from the Internet become evident.

Another possibility recently raised by Greenspan¹) is that and I quote: "... inaccurate estimates of intermediate inputs and prices can shift measured value added from one sector of the economy to another without affecting the total. The implication is that aggregate productivity is measured more accurately than sectoral productivity". He notes that some analysts argue on the basis of this that disaggregation of national productivity figures is inappropriate. This may be a reason why Gordon finds that the Solow paradox is alive and well in the non-durable manufacturing sector of the economy.

I found Gordon's discussion of the comparison of the Great Inventions and today's information revolution is not only fascinating but also highly entertaining. His overall conclusion from this comparison is that "... computers and the Internet do not measure up to the Great

Inventions of the late 19th and early 20th century, and in this sense, do not merit the label 'Industrial Revolution'". However, there can scarcely be said to be a level playing field for this comparison. The ICT revolution suffers a disadvantage in the comparison in that we are not in a position to judge it with hindsight, unlike the Great Inventions. Indeed, it is argued by many, and I would sympathise, the ICT revolution is just beginning.

Some of the direct benefits from the application of ICT to industry are, in my opinion, hugely promising. The application of B2B and B2C e-commerce will increasingly lead to some of the conventional channels of distribution being disintermediated as producers sell directly to each other or directly to the consumer. This should also contribute to moderating cost pressures on inflation, with a like contribution coming from reduced search costs associated with the Internet.

The application of the new technologies also contain the potential to transform market structure and increase competition via substantial reduction in entry costs into many of the new information industries. Technology is in the process of transforming many markets that were previously subject to a monopoly into contestable markets increasing efficiency and putting downward pressure on prices in the process (airlines, railroads, telecommunications, public utilities in general, etc.).

The new communication and information technologies will improve the co-ordinating capabilities of modern market economies, which are based on decentralised decision making. One concrete manifestation of improved co-ordination,

1 See Greenspan (2000), speech.

already apparent, can be cited. It takes the shape of a more optimal use of inventories, enabled by improved management of the supply chain and “just-in-time” inventory management. There is some tentative evidence that changes in the management of inventories may have helped to dampen business cycle fluctuations.¹⁾ As argued already, this is yet another channel through which the ICT revolution may already have made a contribution to the acceleration in productivity growth in the US in the latter half of the 1990s.

As I have argued already, one of the shortcomings of the growth accounting framework is that it tends to neglect the types of indirect channels through which the technology operates. I have illustrated this point already in the context of financial markets, but let me just say a few words about some of the other indirect channel which are I have already mentioned.

Figures demonstrate that the openness of the US economy has more than doubled over the last decade and a half or so attributable, inter alia, to the NAFTA regional trade agreement. Many channels have been identified through which such increased international trade liberalisation in goods and services could make a contribution to containing inflationary pressures, increasing productivity as well as stabilising output growth, the main features of the New Economy. For example, trade liberalisation, by increasing the level of competition, can exert at least temporary downward pressure on prices. It can also increase factor productivity through reorganisation and specialisation of production in line with absolute

and comparative advantage. It also allows firms to increasingly diversify their production activities around the world giving them natural insurance against many types of country-specific shocks, thereby helping to stabilise output growth.

Another notable trend which is relevant to the current discussion is the systematic fall in the ratio of the physical weight of trade to its value (see Alan Greenspan, 1996). The average weight of a real dollar of US exports halved in the short period between 1990 and 1996, according to estimates from the OECD, which reckons that half of member countries’ national output to have been already “knowledge based” by the mid-1990s.²⁾ The corresponding fall in transportation costs, which are clearly directly related to bulk and weight have almost certainly rendered geography much less of an obstacle to competition than it was when the composition of trade was much heavier and bulkier. This could be yet another reason for increased US corporate efficiency and subdued cost push pressures. Again, technology has played a central role here but the benefits to the overall US economy have been significantly delayed, but are no less real for that.

Nor should we neglect improvements in the working of the US labour market and the non-negligible contribution which technology has made to this. It appears that the matching process in the labour market has become more efficient. This is evidenced by the inward shift



1 See for instance McConnell, M. M., Mosser, P. C., Perez Quiros, G. *A decomposition of the increased stability of GDP growth*. In: Federal Reserve Bank of New York, *Current Issues*, Volume 5, Number 13, September 1999.

2 As quoted in Coyle, D. (1998). *The Weightless World*. In: The MIT Press, Cambridge, Massachusetts.

in the Beveridge curve.¹⁾ Improved communications technologies have led to reduced frictional unemployment by operating to enhance the matching of vacancies to those unemployed looking for a job. In other words, a permanent improvement in the matching technology has led to lower unemployment.²⁾

Being a central banker myself, I think that the US central bank, the Federal Reserve, should take some of the credit for the improved performance of the US economy over the last half decade or so. Monetary policy, which in the 1970s was plagued by multiple objectives of “full employment” and “stable prices” is now, following the successful disinflation of the 1980s, firmly orientated in practice towards price stability. Indeed, since 1993 inflation has been at or below 3%. The benefits to the real economy from the successful pursuit of price stability (the *de facto* if not the *de jure* objective of the Federal Reserve) have been well documented many times. These include the improved working of the relative price mechanism leading to more efficient resource allocation, the reduction of dead-weight risk premia in long-term real interest rates enabling more profitable investment projects to be undertaken, reduced distortions in the tax and welfare system arising from waves of inflation and disinflation (or even deflation) and the avoidance of inflation-induced arbitrary redistributions of income and wealth.

It is my own personal view, which is nevertheless backed up by a lot of empirical evidence, that a high and variable inflation rate is

very detrimental to the workings of modern market economies. The corollary is also true, namely that price stability, but more specifically durable price stability, ensures that the relative price mechanism sends out the correct signals as to where resources should be allocated. One can even imagine this allocation of resources being improved on further by the provision of an efficient communications network, which would allow not only local but also truly global relative prices to be compared and resources to be allocated more efficiently on a global basis. Such a network is now available in embryo in the form of the Internet. I think that the combination of durable price stability with such a communications network would be a powerful force for a more smoothly operating and more productive capitalist economies.

Professor Felderer evaluates a number of hypotheses that purport to explain the different productivity performance of the US economy compared to the European economies.

In terms of what I have said already, it is hardly surprising that I agree with Felderer that differences in the growth and productivity trends between the US and Europe are not capable of being fully accounted for by differences in the degree of adoption of the new ICTs. I also agree with Felderer that European corporatist structures are no longer the most efficient institutional arrangements in the context of the new globalised economy and that the European way of dealing with globalisation is less conducive to pro-

1 See Bleakley and Fuhrer (1997). *Shifts in the Beveridge Curve, Job Matching, and Labor Market Dynamics*. In: *New England Economic Review*, Federal Reserve Bank of Boston, Sept/Oct.

2 See Gomme (1999). *What Labor Market Theory Tells Us about the “New Economy”*. This, of course, may not be the only factor behind the shift in the Beveridge curve. Official programmes of job search assistance may also have played a part.

ductivity growth when compared with the US.

Given Felderer's argument to the effect that economic and political integration in Europe had an important positive effect on productivity, I can only presume that he would agree with me that the combined effect of the Single Market and the Single Currency in the EU-11 might also prove, in time, to be a significant driving force behind the emergence of a New Economy in the EU-11. In this context, it is worth mentioning some recent results suggesting that the beneficial effects of currency unions on economic performance and growth are substantial.¹⁾

I would also sympathise with the Felderer view that differences in the volatility of the growth rates between the US and Europe could be one, and possibly an important one, of the reasons for the differences in the performances of the two economic areas in the 1990s and particularly in the latter half of the 1990s. I would also go along with his rejection of the Christina Romer (and also incidentally John Taylor²⁾ more recently) explanation of reduced volatility of output growth as being attributable exclusively to improved monetary policy.

I am much less inclined, however, to endorse the Felderer capital flow hypothesis of differential performance. If it were correct that large capital inflows into the US helped to "increase stock prices and build up a bubble, particularly in the new economy ... creating the

illusion among American households that wealth has increased", and that that was the whole story, then we would have seen an acceleration of inflation in the US during the latter half of the 1990s. This is the opposite of what was actually observed, namely significant disinflation. The alternative story which I find more attractive is that foreign investors have been, and still are, buying into the highly productive new technologies in the US and, at the same time, providing funding for start-up companies there.

It is notable that the title of this module of the conference is "Economic Growth, Technical Progress and Inflation". However, most of the discussion in the papers by Gordon and Felderer concern technical progress and economic growth. There is not much discussion of inflation. Some of the supposedly New Economy phenomena such as a higher productivity growth rate and more intense product and labour market competition will not do as plausible explanations as to why inflationary pressure might be *permanently* abated. Of course, if the types of effects mentioned continue for some time then they can be expected to exert downward pressure on inflation for some time as well. However, there is really nothing in their papers about inflation, at least as understood by central banks, as a monetary phenomenon over the medium to long term. ❧

1 See Frankel and Rose (2000). *An Estimate of the Effects of Currency Unions on Trade and Growth*. Paper presented at the ECB as part of its Invited Speaker Programme.

2 See Taylor (2000). *Remarks for the Panel Discussion on "Recent Changes in Trend and Cycle"*. Prepared for the conference "Structural Change and Monetary Policy" sponsored by the Federal Bank of San Francisco and the Stanford Institute for Economic Policy Research, March 3-4.

LUIGI SPAVENTA, MODERATION

HELMUT KRAMER

PEDRO SOLBES MIRA

SHIGEMITSU SUGISAKI



Herausforderungen

für die

Wirtschaftspolitik

Podiumsdiskussion

New challenges for economic policy

Asked what to expect from a better economic policy could provoke many and very far reaching objectives: the question of growing disparities among classes, regions and continents on earth, the need for an environmentally sustainable global growth strategy, the question of what use to make of new technologies and how to spread its profits quicker and more even among societies, just to mention a few of them for which an adequate and viable answer would represent a major human achievement.

I feel a little bit more tempted to elaborate on the somewhat narrower question whether there is room for differing economic and social models for societies in highly developed regions, more precisely: whether and to what extent the idea of an European socio-economic model as distinct – in a number of important aspects – from an American or Anglo-Saxon model should serve as an orientation for European economic policy, under the condition, however, that it represents not just wishful thinking on the side of Europeans but also an economically efficient solution for the problems of a modern economy and society.

Given the time limits imposed on us I should like to restrict myself on a few issues even closer at hand and somewhat less basic in principle:

Official documents of the EU Commission, the Monetary Fund, the ECB or the OECD Secretariate on the broad guidelines of economic policy are revealing – as I see it – a remarkable degree of correspondence. The prescriptive advices given to national economic policy are differing only in the order of the

enumeration, but not in the essence of their content. They basically advocate unanimously four main strategies to be pursued simultaneously (I use the words chosen by the EC Commission in its recent broad guidelines of April 11, 2000):

- Ensure stability-oriented policies by means of appropriate wage developments and sound public finances,
- improve the efficiency of labour and capital as well as of product markets,
- foster the development of a knowledge based economic activity, and
- modernise the social protective systems in order to make them more efficient and capable of the challenges of the years before us.

Progress along such lines is considered the standard recipe for sustained growth in income and employment.

I cannot refrain from labelling this bundle of prescription a sort of new orthodox consensus. I will not discuss the three latter prescriptions, but will instead of concentrate on the first one, the high priority given to a stability-oriented policy.

To me the new orthodox consensus is adequate to bring about the results envisaged, but only under certain conditions. Certainly the precise content of what such a formula implicitly mean remains to be defined. Defining the possible meaning of the formula makes it more than a matter of course.

Below such a guideline the problems of the reality of economic policy are slumbering in detail.

Those *are inter alia*: How to react in case of sudden exogenous shocks?

What to overcome political or social problems of acceptance? How to arrive at the necessary international co-ordination? And, most common in a real life situation: which indicators to use for measuring sound fiscal policy or appropriate wage policy?

Let me give just two examples of what I mean. I try to choose issues which arose out of the field of EU economic policy, as a consequence of the high degree of economic integration of member economies. This latter fact – the need for some sort of international co-ordination, makes solutions, both, more difficult and more promising.

I Tax policies

There is broad consensus among economists – based on convincing analysis and evidence – that present national tax systems, at least in Europe, display a number of worrying deficiencies. Their removal should be considered as a major challenge for national as well as European tax policy.

Effective tax rates on labour costs and labour income in Europe seem to be adversary to employment goals, whereas they are at the same time highly questionable from the point of view of social equity. Nevertheless they show an ever increasing trend, because their tax base – dependent labour – is, in contrast to other tax bases, not able to escape taxation in the same way internationally mobile tax bases – mainly corporate profits and interest payments out of savings – can.

Thus, lowering the tax burden on wages and salaries would be promising, not only because of triggering incentives for extra individual efforts and for a higher degree of employment, but also because it would reduce the imbalance of tax

incidence on the sources of different functional income sources.

Even better, in case of shifting the tax burden to environmental emissions, a double dividend is promised because such a shift would not only contribute to the economic and social goals mentioned but also to environmental quality.

Despite rather convincing empirical findings on that issue no major progress seemed to be possible up to very recently in individual countries as well as in the attempts



at coordinating national tax structures on the EU level. The reason for this has to be seen in non-co-operative national behaviour which prevented up to now consensus required on the EU level for the co-ordination of taxation systems. Behind this behaviour can assumed either the influence of national as well as international lobbies of specific interest groups who are able to exert a sufficient pressure on national governments or considerations of national prestige or political tactics which rank isolated and short-sighted non-co-operative temptations and prestige considerations higher than the obvious advantages of consensus.

In the meanwhile we seem to be stricken with a situation which is not only suboptimal from the point of view of the efficient working of market forces in the common internal market, but also with an ever more problematic social incidence of taxation and all of that aggravated by the

increasing concern about the longer-term consequences of energy use and of other forms of environmental emissions.

2 Budgetary policy

A fierce debate has taken place in Europe and elsewhere on the economic rationale of the stability criteria of the treaties of Maastricht and Amsterdam.

Targeting the budget deficits in the medium-term to “close to balance or surplus“ turned out to be a



politically powerful argument for national governments to break unsustainable and undesirable trends in state budgets and, at the same time, a pledge ensuring mutual trust among partners.

From the point of view of long-term intergenerational policy orientations this very crude guideline cannot be considered as the final cornerstone of economic wisdom, nor as a standard recipe in case of exogenous or domestic shocks.

The basic problem which remains for a solution better exploiting economic theory is that neither the indicator “net deficit“ nor that of “limits to state indebtedness“ are unambiguous in the absence of qualifications on a number of other national or international features of the situation in question.

The problems arising can be demonstrated when trying to give an answer to the question: “what reason for, what use of budgetary surpluses“? Obviously surpluses seem at least as unfounded as deficits, at least in case of countries enjoying already low public indebtedness.

The next question is whether it is arguable to except budgetary deficits

from the rule to the extent they are originating from the amount of public investment designed to improve the efficiency of the economy in the future. Consolidation politics have resorted in practice again and again to cuts in the share of public expenditure for of such (material or immaterial) investment – at the expense of the longer-term growth potential!

This means, a sound and comprehensive assessment of future profits forgone because of suboptimal public investment seems indispensable.

The question of the intergenerational allocation of advantages and burden needs a very careful investigation which is cannot provided by the broad budgetary rules of Amsterdam. Investing into income earning capacities of an economy – into its infrastructure and education systems – is one of the options left open to handle the impact of the so-called demographic-bomb in the decades to come.

I think, the budgetary policy advice given to national governments in recent examinations by the EU or the IMF to go for surpluses in order to get room for manoeuvre in case this important extra-budgetary burden begins to increase is just one element of an appropriate intergenerational assessment. The prospect for productive capacities would be another.

In a similar way, doubts remain as to the preparedness of the national budgetary policy complying with the budgetary targets of Amsterdam to absorb asymmetric shocks hitting the national economy or simultaneously a group of partners of EMU.

For this case the orthodox consensus nowadays seems to allow for the working of the automatic stabilizers within the limits given by the 3% deficit rule.

But, it seems to me, that the possible use of discretionary counter-cyclical measures is barred from the option a national government may use. The obligation taken in Amsterdam may indeed be tempting a government in such a case to hesitate – according to the specific antideficit procedures agreed upon and the inevitable time lags – where a more determined policy could prevent the multiplier effects of shocks.

I admit that such a policy requires a clear picture of the structural and short-term forces and determinants at work in a state budget. In other words I strongly advocate introducing a number of structural features of the budget as well as of the respective national economy into the code of conduct of budgetary policy monitored by the Commission and the ECOFIN.

There are signs for the emerging of an enlarged consensus on such guidelines for structural properties

of budgetary policy going beyond the oversimplifying present state of the politically correct instructions manual for budgetary policy written in Amsterdam. But this process could need more time than we are given before the business situation in Western Europe will again be deteriorating.

I am well aware that policy rules have to be very simple in order to gain political influence in the practice of our systems of democracy. Nevertheless, such simplifications involve a number of important risks in reality. Reality is far more complex than it is desirable from the point of view of political implementation.

Concluding, I wanted to plead for the full exhaustion of economic wisdom instead of superficial and and at times misleading formulas, which are, at present, the substrate of a highly questionable orthodox consensus. ☛

Challenges for economic policies

I would like to begin by thanking the conference organisers for the kind invitation to address you today. The subject of this meeting is well chosen as much discussion is taking place on the new economy and on a new paradigm. I will contribute to the debate with some remarks from the policy perspective.



Before I come to the heart of my presentation, I would like to say some words on the *new economy* so as to place the discussion in its proper frame. Then I will address the key challenges for economic policies.

I The new economy

The move from the production of goods to the production of knowledge is the main characteristic of the new economy. This change in the composition of output involves at the same time changes in technologies used and the economic structure.

As I see it, most of the economic laws will remain what they were, but the prevalence of some phenomena that are usually treated as special cases, will grow rapidly. I think among others of the following.

- *Returns to scale or fixed costs and network effects.* These are present in many of the information and telecommunication industries,

and create circumstances that are conducive to monopolistic markets and hence possibly to the exploitation of consumers. There exist various measures to deal with this, notably those that enforce competition directly, and those that make the market as wide as possible by ensuring efficient working of the internal market of the EU.

- The *non-exclusive* aspect of ideas makes them very similar to public goods – however in the private sphere of activity. It does lead to problems with respect to the incentives for creating new ones. A European Union patent would address this issue.
- *Obsolescence of skills.* Since the industrial revolution technical progress has often caused some people's skills to become obsolete. Clearly, with more rapid technological progress, this phenomenon might become more widespread. More emphasis on education is needed, notably on life-long learning and on active labour market policies, which tackle among others, the skills of people liable to become unemployed.

Perhaps this gives the impression that I have a negative view of the new economy. Certainly not! As I see it, the new economy offers an unprecedented range of new goods and services at low prices. It also seems to permit a higher economic growth.

Notwithstanding these developments, my attitude is one of caution. The proper mind-set of a policy maker is, I believe, to anticipate the potential difficulties involved and to

deal with them, whilst encouraging the new economy to blossom.

The development of the new economy is part of the key EU objectives as defined by the Lisbon recent Summit, together with restoring full employment, coping with population ageing and preventing social exclusion.

Thus, policies try to respond to these objectives in a new rapidly changing environment.

2 The challenges for economic policy making

Since early summer 1999 an increasingly robust and broadly-based economic recovery is taking place in the EU. Solid growth is likely to take place without encountering capacity constraints and generating inflationary tensions if, as expected, wage developments continue to be appropriate. Yet, in countries with more mature recoveries there are some indications of overheating risks. Against this background, economic policy making has two main goals.

- First, it is necessary to preserve price stability during periods of recovery. To ensure adequate and growth-supportive monetary and financial conditions, no inflationary pressures should emanate from budgetary and wage developments. However, ensuring the realisation of the current growth potential through an adequate macro-economic policy mix is not sufficient.
- A second, more important, goal is to raise significantly the Union's growth potential. The EU economy can, in this respect, be improved along three lines: its low participation and employment rates need to increase, its low investment ratio needs to rise, and productivity needs to

grow. Hence, the focus of economic policy must now shift towards achieving more dynamism, i.e. more entrepreneurship, higher levels of investment and a higher effective labour supply.

3 Policy responses

The three main responses to these goals are to foster the knowledge-based economy – this issue has been the principal subject of the European Council that took place in Lisbon last



March –, to press ahead with economic reforms and to improve the quality and sustainability of public finances. I will deal with these in turn.

3.1 Fostering a knowledge-based economy

There is no simple formula to establish a knowledge-based economy. Certainly, governments have an important role to play, notably by setting norms and standards in order to ensure the harmonisation or compatibility of technologies, but governments alone cannot ensure the transition to the knowledge-based economy. The US experience serves as a good example for the EU. We must aim at creating market conditions that are receptive to new technologies. To mention some of these conditions:

- We should prepare the *work force* for new technologies. Life-long learning should become standard.

- We should facilitate the financing of R & D, notably by using tax policies and promoting risk capital. We must strengthen research by avoiding its fragmentation and promoting the mobility of researchers.
- We need an *EU patent* rapidly.

3.2 Pressing ahead with structural reforms

The Economic and Monetary Union has brought about a macroeconomic regime change. On top of that, it is



in the process of producing changes of a similar scale at the structural level. What is needed in EMU are markets that react rapidly to changing circumstances. It is necessary to replace the slow adjustment of the past

with more flexible markets – markets that swiftly reallocate workers and capital to where they are needed.

Progress in structural reforms has been strongest in the implementation of Single Market legislation and the liberalisation of telecommunications and electricity markets. Much, however, remains to be done. To realise greater dynamism for a faster growing economy, markets need to function better:

- We need more efficient *product markets*. Less State aid, a better implementation of public procurement rules and stronger competition authorities are necessary; a number of markets must still to be liberalised.
- With respect to *capital markets*, the introduction of the euro has created an incentive to increase transparency and remove fragmentation. Remaining barriers still exist in both national and regulatory and fiscal regimes. Needless to say, the Commission

is determined to support and promote the emergence of deep, broad and liquid financial markets in the euro area. It is therefore vital to take a series of measures ranging from regulatory harmonisation such as a “single passport for issuers” to fiscal actions to promote risk capital and Community legislation on take over bids.

- Finally, we need more efficient *labour markets*. EU Member States must move from passive to active labour market policies, must implement a reform of tax and benefit systems to strengthen incentives to take up and create jobs and must examine efficiency of the employment protection legislation.

With these reforms the EU economy will be able to handle shocks better – both adverse shocks and favourable ones, such as the opportunities offered by the new economy.

3.3 The quality and sustainability of public finances

Another policy challenge facing the EU is its public finances. Firstly, there is a genuine prospect of the EU achieving the goal that it set itself in the Stability and Growth Pact, which is to have budget positions “close to balance or in surplus”. It would be the first time in over thirty years that the EU has achieved a balanced budget position. The opportunity for achieving this goal is helped by the fact that growth projections are now higher than assumed by authorities when setting targets in their stability and convergence programmes. To reflect this favourable economic scenario, I have called upon Member States to achieve their targets one year ahead of schedule. Doing so we would send a tangible signal of Member

States' commitment to fiscal discipline in EMU.

Secondly, there is the challenge of improving the *quality and sustainability* of public finances. Without going into detail, I would like to draw your attention to one aspect of the "quality" of public finances, namely taxation.

The reforms of the tax system that lower the burden on labour can improve incentives for employment and investment. However, tax cuts are not self-financing and would need to be compensated with spending cuts to prevent government deficits from rising.

As regards long-term sustainability, the running-down of government debt can make an important contribution towards preparing for the budgetary impact of ageing populations. However, the reform of tax and benefit schemes remains absolutely necessary. Reforms may also be required to ensure that other vital public expenditures such as public investment are not squeezed out. The current period of high growth is an ideal opportunity to enact what are politically difficult reforms, which would send a strong message of the EU's determination commitment to public finance sustainability.

4 The need for enhanced policy co-ordination

The Economic and Monetary Union necessitates *co-ordination of economic policies*. Whilst the conduct of monetary policy is centralised in EMU, responsibility for the conduct of most other economic policies remains decentralised with the Member States. To guarantee a consistent policy mix at both the euro-area level and at the Member State level, it is necessary to co-ordinate these decentralised economic policies.

From a historical and international perspective, the co-ordination

process triggered by EMU is unprecedented. The experience so far in the third stage of EMU has been by and large positive. The Helsinki European Council concluded, however, that some strengthening of co-ordination would be valuable. To enhance effective policy co-ordination, two ways present themselves, namely a more effective peer pressure and a more powerful Euro-11 Group.

- Peer pressure among independent actors is a chief instrument for policy co-ordination. The Commission has therefore decided to issue a "report on the implementation of the Broad Economic Policy Guidelines" each year from 2000 onwards. The first report gave an in-depth analysis of the implementation of both general and country-specific guidelines. It concluded that Member States that have pursued a comprehensive strategy in line with the BEPGs have achieved the best results in terms of economic performance. Furthermore, more effective policy co-ordination in EMU also calls for other substantive improvements. Among these, I would ascribe particular importance to:
 - a common assessment among policy makers of the current economic situation and prospects, especially in the euro area; and
 - a clear understanding of how economic policy should respond to this common assessment.
- The Euro-11 Group is an informal assembly of Finance Ministers from the eleven Member States of the euro area and the Commission, with the ECB frequently taking part. It has proved essential in helping euro-area

Member States to reach a common view on issues of common concern. In this respect, the Euro-11 Group can be credited for bolstering a consensus on the warranted policy mix to withstand the slowdown in 1998 to 1999 and for raising awareness of the problems associated with the weakening of the euro in the early months of this year. However, there is a perceived need to strengthen the role of the Euro-11 Group, to increase its visibility and transparency and to improve its communication. In full conformity with existing Treaty provisions, ways should therefore be found to strengthen current arrangements. As you know, the upcoming French and Belgian Presidencies of the Euro-11 Group have announced initiatives in this field. The Commission is determined to play an active role in these debates. Further-

more, it will enhance its efforts to contribute to improving the economic management of the euro area by providing the Euro-11 Group with the necessary economic analyses and statistics for the euro area as a whole.

I will conclude by recalling that the economic outlook for the European economy is favourable. Amid uncertainty about the extent of the arrival of the new economy in the Union, we must continue to pursue sound macroeconomic policies and enhance the potential for economic growth by promoting dynamism, higher investment and full employment. Structural reforms, among others to create favourable conditions for the knowledge-based economy, are necessary for this purpose. To facilitate these policy moves in the EU Member States, a stronger co-ordination of economic policies will be advantageous. ☛

The challenges to economic policy

I Introduction

I speak to you in a panel discussion titled “Challenges to Economic Policy.” Where I work, such a topic could attract thousands of suggestions but I would like to concentrate on merely three issues which have occupied most of our time during the last 15 years. These are:

- a) the promotion of *growth and poverty reduction* in the world’s poorest countries;
- b) *managing the transition* from centralized to market economies; and
- c) *reforms in policy making and at the IMF* as a consequence of the economic crisis in Asia, Russia and Latin America. I would like to take up each of these three issues in turn.

2 Poverty reduction and growth

In the last 15 years, the IMF has consistently increased its role and sharpened the focus of its policies directed towards achieving rapid economic growth and a sustainable increase in the living standards in its poorest member countries. More than a decade ago, the IMF set up concessional lending facilities to help these adjustment efforts as well as to provide a vehicle to address the social consequences of adjustment programs more directly. Although there was a noticeable increase in growth rates as well as an improvement in key social indicators, poverty has persisted and even grown deeper roots in some parts of the world. Thus, in recent months, the Fund – together with the international community – has fully embraced the enhanced *Heavily Indebted Poor Countries (HIPC)* Initiative which deepens

the Fund’s involvement with developing countries through faster, deeper and broader debt relief to low-income countries which are able to strengthen the link between debt relief and poverty reduction. Also, through the provision of technical assistance, emphasis is being put on national capacity building.

Looking ahead, the centerpiece of IMF’s strategy is a concessional loan facility which will make HIPC debt relief an integral part of broader efforts to reduce poverty. Programs under this facility will be prepared in an open and consultative manner

and will entail important changes in the way the IMF and the World Bank operate and collaborate. A key change is that the complementarity of macroeconomic, structural and social policies will now be given greater recognition and the *Poverty Reduction Strategy Paper* will provide a new vehicle to integrate these policies in a mutually reinforcing way.

I should reiterate that the fundamental objective remains sustained poverty reduction and the experience of successful reformers shows that sustained policy implementation is required to attain this objective. This also requires strengthening the incentives to undertake the needed reforms. Industrial countries can contribute to this effort by providing higher concessional assistance as well as significantly improved access for exports of developing countries to their markets. On their part, developing countries not only need to maintain a stable macroeconomic environment but also implement



supporting structural policies which are critical to a supply response. It goes without saying that this requires making the most effective use of fiscal resources and in this context I regret the magnitude on which violence has recently erupted in many countries, especially in Africa, which has usurped precious resources. Finally, history has shown the importance of maintaining high quality of governance and strict accountability in policy making which are essential to generating domestic and foreign investment.

3 Managing the transition from centrally planned economies

It is clear that during the last decade, the process of transforming centrally planned socialist economies has indeed been very complex with far reaching changes in the political, economic and social relations that existed within each of these countries. In every case, the key reform measures included macroeconomic stabilization, price and market liberalization including that of the exchange and trade systems, restructuring and privatization, and redefining the role of the state where it provides and enforces a level playing field as well as corrects market imperfections as and when they occur.

As you know, the IMF – along with the World Bank and other national and international agencies – has been heavily involved in assisting with the transformation of centrally planned economies. All of our efforts have been centered around achieving and the consolidating macroeconomic stabilization, and accelerating structural reform. With respect to the latter area, IMF efforts, along with those of the World Bank, in the transition economies in many respects broke new

grounds, both in advising on why structural reforms were essential and how they could be carried out. Our technical assistance program to transition countries has played a key role in helping the authorities adapt their monetary, exchange rate, fiscal and statistical systems to the requirements of a market economy. Training of officials from these countries – together with technical assistance – has importantly contributed to institutional building.

The key lesson we have learnt is that financial stabilization is only a necessary condition for growth and that comprehensive progress on all fronts of a broad structural reform agenda is indispensable for sustained growth. In this context, the most successful transition economies are those which have undertaken more and faster reform. There are also areas where we have met with considerable challenge. For example, while privatization is a key element in the reform process, both the absence of hard budget constraint as well as insider privatization have failed to lead to self-induced restructuring. Similarly, poor governance – ranging from the government not pulling back enough from interventions in economic activity to not providing the discipline of law and order – has often delayed and even impeded reform by discouraging foreign investment and encouraging the flight of capital.

With the above as background, you may ask as to what is the agenda ahead? For most of the Central European and Baltic countries, the reform process is very advanced and the issues they face are similar to those faced by many middle-income market economies. For example, there are the challenges of joining the European Union, a strong recovery running ahead of itself, possible reversals of capital

inflows, efficient intermediation by the financial sector, and rationalization of expensive social programs. There are other countries in the former Soviet Union, who are in varied stages of recovery and where the agenda ahead remains quite large. In particular, there is a need to consolidate macrostabilization, push ahead with key structural reforms, provide for an effective rule of law and fair tax and regulatory systems, strengthen the financial system so that it conforms to internationally accepted codes and standards, and improve governance. Much too many resources continue to be devoted to unproductive expenditure and corruption is at unacceptably high levels. Finally, there are a handful of countries in the region who have scarcely begun reform and are in the danger of backsliding.

4 Reform in policy making and at the IMF

As you know, the IMF is a cooperative institution of 182 members and, on an ongoing basis, our membership sets the priorities for the institution and the Fund adapts its policies and operations to reflect these conclusions. Thus, it will come as no surprise to you that the recent debate outside the Fund has been matched – in intensity – by the debate and actions within the Fund about reforms in economic policy making and within the IMF itself.

As for the work of the Fund, *surveillance* – policy dialogue of the IMF with the authorities of each country and the implication of these policies for the international financial system – remains at the core of IMF operations. This core activity has been transformed significantly following the Asian crisis.¹⁾ The focus now is on new sets of codes and standards – relating to financial sector soundness; transparency in fiscal, monetary and financial policies; data provisions; and corporate governance – to guide the conduct of economic policy in a variety of areas. This emphasis, which is supported by a significant amount of technical assistance, increases policy-making accountability and allows for better-informed lending and investment decisions. In particular, you all know that the Fund, together with the World Bank, has embarked on an ambitious Financial Sector Assessment Program (FSAP) to assess financial sector vulnerabilities as well as observance of financial system standards. This work (culminating in Financial System Stability Assessments) is discussed in the context of the annual surveillance discussions. These new directions for the Fund also pose new challenges in *cooperating with other standard setting bodies* who possess substantial expertise in developing assessment methodologies, refining standards, and conducting assessments.

1 It is useful to recall that as a broad generalization, the crisis in Asia was the result of the interaction of macroeconomic imbalances and fundamental structural problems. The macroeconomic imbalances were reflected in rising and unsustainable external current account deficits and a buildup of external debt – in particular short-term debt – which were linked to the maintenance of exchange rate pegs. Most important, there were deep-seated structural weaknesses of financial institutions, insufficient bank supervision, and nontransparent relationships among government, banks, and corporations. Corporate debt also became a particular problem when exchange rates tumbled and corporations became insolvent because of their large dollar debt. Several of the countries experienced volatility in prices and sudden market movements that ultimately precipitated a crisis. What made the crisis so different from previous ones, and so difficult to tackle once it started, were the financial vulnerabilities in the banking and corporate sectors, and the speed and size of capital flow reversals that occurred once those vulnerabilities were revealed.

It will come as no surprise to you that in recent times much discussion has also taken place about the *virtues and pitfalls of pegged exchange rates*. Experience shows that there is no question that getting the exchange rate right is an essential element of a sound macro package. It is also clear that the macroeconomic and structural policy requirements of maintaining a pegged rate are demanding, particularly in an environment of increased mobility of international capital. At the same time, a number

may bring has to be used wisely and needs to be weighed against the long-term damage to investor confidence and the distorting effects on resource allocation.

This brings me to the topic of the *role of the private sector* in crisis prevention and in a crisis. There is no denying the fact that private capital markets are the engines of growth around the world and “good business practices” on the part of the country and the lender would mean the implemen-

tion of sound policies and good risk appraisal, respectively. There is thus a need for co-operation – or constructive engagement – amongst borrowing countries, the private sector and the official sector to develop

broad rules which would apply in a crisis which are and perceived to be fair to both creditors and countries.

An essential element of the reform of the international financial system is the *provision of comprehensive, timely, high-quality and accurate information* to the markets. The Fund releases a vast array of information to the public like its assessment of the countries’ economic policies, individual modules as part of the overall report on standards and codes. In addition, countries borrowing from the Fund are encouraged to release to the public their policy commitments under the program. *Transparency on the part of the IMF itself* can also contribute to a better understanding of policies of member countries. Here too, important progress has been made. Also, regular internal and external evaluations of Fund operations – which are also released to the public – also provide another assessment of our work.

of economies with fixed exchange rate arrangements, including under currency boards, have been successful in maintaining exchange rate parities. All in all, experience has shown that countries that maintained consistent monetary and exchange rate policies and supported liberalization with financial sector reform have been better able to handle capital inflows and their subsequent reversals.

The Asian crisis also aroused a spirited debate about *capital account liberalization* where the Fund has emphasized an orderly and well-sequenced liberalization process, to be supported by an adequate institutional set up to strengthen the ability of financial intermediaries and other market participants to manage risk. I would like to note that introducing or tightening capital controls is not an appropriate response to deal effectively with fundamental economic imbalances. Any temporary breathing space that such measures



Over time the *Fund's financial operations* have also been adapted to the changing economic environment. In the period ahead we will review whether our current facilities fully meet the needs of our members. As this discussion proceeds ahead, we will be guided by a number of underlying principles including the need to preserve the Fund's ability to provide and catalyze support for individual countries; retain the Fund's ability to respond quickly and effectively to short-term balance

of payments problems; continue to support reforms that deal with structural problems closely related to IMF's area of expertise; and be in a position to respond rapidly and on an appropriate scale to crises of confidence in the capital markets. Clearly, the long-run goal must be to discourage undue reliance on the use of IMF resources and encourage countries to move towards sustainable access to, and reliance upon, private capital. ❧

GEORG WINCKLER



Universities and innovations system: The case of Austria

First

Let me begin with two observations on university research. First, a recent OECD report (OECD, 1998) concludes: “By 2010 or 2020, both the character of university research and its relation to society are likely to be very different from what they are today. In short, university research is currently in transition, and the details of its future form are not yet known”.

The second observation deals with the link between university research (basic research) and productivity growth in an economy. Direct links are difficult to assess. Probably there are only indirect links. In any case, it is hard to register them statistically, since the effects of basic research diffuse internationally through many channels. Given these doubts, it is encouraging for the universities to know that, e.g., various EU programmes have been justified by statements on direct and positive links between basic research and economic growth.

A first conclusion of my speech is therefore that the character of university research will change in the future, that the dimension of its present impact on the economy is dubious, but that governments seem to be convinced of the long-term usefulness of basic research.

Second

During the past years, several factors have contributed to the emergence of partnerships between universities and firms. Restrictions on government financing of universities (e.g. reductions of “general university funds”), the strong demand of firms for science-based knowledge on product innovation as well as production processes, and the pressure of internationalisation on both sides have increased the mutual interest to engage in new partnerships. As a consequence, the knowledge transfer from universities to firms no longer pass exclusively through publicly accessible means (publications, teaching at universities). Increasingly, this transfer is targeted to specific research outcomes, jointly defined and developed by firms and universities.



Third

The direct financing of universities by firms, however, remains limited. The OECD (OECD, 1998) estimates that industry funding of university research within the OECD area averages around 5%, ranging from 2% in Japan (and probably 2% in Austria) to about 6% each in the US and UK and to nearly 11% in Canada. Yet, in many countries (US, UK), as much as 20% of university research is associated with industry in various ways (in Austria, esti-

mates indicate that this figure is about 6 to 8%).

These numbers demonstrate that the newly emerging partnerships between universities and firms are less established by explicit contracts. Instead, informal arrangements seem to prevail: informal partnerships among individual researchers in industry and academia, special dissemination of information, advisory exchange programmes, student training placements in industry etc. Since the costs of university research associated with firms are higher than the financial means flowing from industry to universities, the question arises: Who is paying the major part of industry-related university research?

Fourth

In many OECD countries, there are various government agencies which sponsor partnerships between universities and industry (see OECD, 1998, p. 7): E.g. government grants go to specific research projects jointly undertaken by firms and universities (Australia: “Collaborative Research Grants Scheme”), to large-scale research programmes, carried out by several partners (e.g. Framework Programmes of the EU), or help financing facilities or centres for collaborative research (Sweden: NUTEK Competence Centres). In Austria, the government launched a programme similar to the one mentioned for Sweden in 1998, the so-called K plus – Programme for Competence Centres. In the first months of 2000, 11 projects of university – industry partnerships were approved. These projects are supported by 600 million ATS from federal funds, triggering research amounting to about 2 billion ATS (Stamper, 2000).

Active government support seems necessary to overcome initial

risks and to secure the positive external effects that such partnerships may bring about for the economy. Ultimately, this support is given by governments in the hope that links between universities and firms will boost economic growth. In addition, instead of financing university research by 100%, e.g. via the “general university funds”, the government benefits from a leverage effect when supporting university – industry partnerships, since some parts of university research get financed by firms.

Of course, one has to keep in mind that an important part of the government support for university – industry collaboration is directed toward particular research programmes with special policy interests, e.g. in the field of defense.

Fifth

A recent report of the Swiss Science Council (Diggelmann, 2000) emphasizes that the stagnation of basic (non-oriented) research and the sharp increase of oriented research programmes, initiated by industry – university partnerships and supported by governments, have taken place without much public discussion. None the less, this shift in research attitude is of far reaching importance for the universities. Let me stress its main implications.

Traditionally, university research was undertaken with no predetermined economic and social objectives. It was curiosity-driven, with long-term interests and reinforced by the aspiration of individual researchers to be quoted, promoted, or even honoured by other academic fellows. The size of pecuniary rewards was only of secondary relevance. This tradition regarded science as a cultural, not as an economic activity. Humboldt’s idea prevailed that universities should be

free in determining the direction of research, thus serving the very long-term interests of society.

If science becomes an economic activity, research programmes may be imposed on universities through financing. When in the past university researchers stressed that much time was needed to get interesting scientific results and that these results should be available to everybody in society (via “publications”) science was not part of business research. Science as an economic activity, however, wants short-term results and is no longer interested in their free availability. Patents start to play a crucial role.

Usually, university researchers stress their freedom and want the tax payers to provide sufficient budgets. Yet, industry wants to discipline researchers by only granting special budgets tied to specific research outcomes.

Furthermore, universities have underlined the importance of ethical standards for research. In industry-oriented research, the interests of business dominate. This fact may compromise those standards.

Sixth

As indicated above, most of the new resources for university research only get tapped if economic rewards are promised either to firms or government agencies. Due to this research orientation and due to more international competition in teaching as well as research, pressure to reform bureaucratic and inward-oriented state universities in Continental Europe is mounting. Especially industry proposes a strictly demand-oriented university system with drastic changes in how universities are organised, how



they hire their personnel and how they design their various study programmes.

Although reform pressures have intensified, it is interesting to note that the leading universities in the US, e.g. Harvard or Stanford University, still attach great importance to traditional academic values. E.g. “openness in research” and non-involvement of students in industry-oriented research still constitute basic values, limiting the commercialisation of universities.



The university reform in Austria as proposed by the Austrian Rectors’ Conference in May 2000 is an effort of muddling through these various policy demands. The key is combining tradition with innovation. Of course universities should be modern, efficient organisations, should be service-oriented, but they should also preserve a high degree of freedom in research and teaching. Universities may still stick to traditional organisational structures, and may even enjoy full autonomy as long as there is competition among universities. Competition among universities and other institutions of the tertiary educational sector, e.g. the polytechnics, should be intensive, especially with respect to recruiting (good) students, to attaining scientific reputation, and to receiving public or private money. It should be left to the international competition, not to the insight of national governmental bureaucrats, to make organi-

sational changes and to reallocate university resources. Accreditation of universities and the regular evaluation of their output should be important elements in making the success of teaching and research transparent and in strengthening competition.

So it should be no surprise that the title of the proposed university reform by the Austrian Rectors’ Conference reads as “Universities Facing Competition. Extended Autonomy for Universities”.

Seventh

How important is Austrian’s university research?

An international comparison reveals that the outlay for university research, as percentage of GDP, is relatively high in Austria:

	% of GDP
Sweden	0.83
Switzerland	0.67
Austria	0.57
Germany	0.41
US	0.39
France	0.38
Italy	0.28
OECD (average)	0.37

Source: Campbell, OECD, 1999.

This relative importance of university research in Austria is due to the fact that 80 to 90% of basic research in Austria is carried out by universities, not by other research institutions or by firms. In Sweden and Switzerland the situation is similar to the one in Austria. In Germany, about 60% of basic research is done in universities, in France it is even only 45%. In both countries large extra university units exist, which are engaged in basic research, e. g. the Max Planck Institutes in Germany. In the US this figure is again 60%, as in Italy.

Basic research in Austria, consequently, relies much on the functioning and the interests of universities. Given the relevance of basic research for the “New Economy”, the question arises as to how universities interact with firms with respect to the transfer of knowledge. As was stressed above (in point 3), partnerships between universities and firms are mostly established on an informal basis. So it is of importance that the overall level of research is low in Austria and that small- and medium-sized enterprises dominate the Austrian economy. Austria does not have large research-oriented firms. As a consequence, the main problem in Austria is that university researchers lack counterparts in industry or financial institutions.

A comparison between Germany and Austria may illustrate that point. In Austria, (see bm:bwk, bm:vlt 2000) there are only about 25,000 full-time researchers, whereas in Germany 460,000 researchers work full-time. Austrian university researchers, together with (young) people working in various research projects of universities, constitute roughly 35 to 40% of the domestic research personnel (own estimate). In Germany, only 15 to 20% of the 460,000 full-time researchers work in universities, the others outside the universities. Hence, in Germany it is easier for university researchers to find someone to communicate and co-operate with.

The good news for Austria is, however, that currently small- and medium-sized enterprises increase

outlays for research more rapidly than big enterprises.

Eighth

Austria’s university researchers lack counterparts in industry. Since more partnerships should emerge between universities and firms, bridging the gap between the basic research of universities and applied research of firms (see Campbell, 2000) is necessary. What is needed is a Europeanisation of national research areas. International scientific co-operation, with the possibility of establishing spin off-firms, is what would help university research most. 📌

References

- Bundesministerium für Bildung, Wissenschaft und Kultur (bm:bwk), Bundesministerium für Verkehr, Innovation und Technologie (bm:vlt).** Forschungsbericht 2000, Wien 2000.
- Campbell, D. F. J. (2000).** Forschungspolitische Trends in wissenschaftsbasierten Gesellschaften – Strategiemuster für entwickelte Wirtschaftssysteme. In: Wirtschaftspolitische Blätter, 47. Jgg., Heft 2, 130–143.
- Diggelmann, H. (2000).** External Demands and Social Constraints: The changed Conditions for University research. Lecture at the 53rd Bi-Annual Conference, CRE, Trondheim June 8.
- OECD (1999).** Main Science and Technology Indicators, Paris.
- OECD (1998).** University/Industry Research Partnerships: Typology and Issues. DSTI/STP/SVR (98) 4, Paris.
- Stampfer, M. (2000).** Das Kplus-Kompetenzentrenprogramm – Zielsetzungen und aktueller Stand. In: Wirtschaftspolitische Blätter, 47. Jgg., Heft 2, 214–218.

FRANZ-WENINGER-STIPENDIEN



Überreichung der Franz-Weninger-Stipendien der Oesterreichischen Nationalbank

Gouverneur Dr. Liebscher und Vize-Gouverneurin Dr. Tumpel-Gugerell überreichten am 16. Juni 2000 im Rahmen der 28. Volkswirtschaftlichen Tagung der Oesterreichischen Nationalbank die Franz-Weninger-Stipendien an vier Preisträger. Das Franz-Weninger-Stipendium wird von der OeNB für hervorragende Diplomarbeiten und Dissertationen auf dem Gebiet der Geldtheorie und Geldpolitik vergeben und erinnert mit seinem Namen an den vor vier Jahren tödlich verunglückten Leiter der Abteilung für volkswirtschaftliche Analysen. Die Stipendien werden vom Direktorium der Oesterreichischen Nationalbank auf Vorschlag einer Fachjury vergeben.

Diesmal wurden die Franz-Weninger-Stipendien den im Folgen-

den genannten Personen für Arbeiten mit den jeweils angeführten Titeln zuerkannt:

- **Herrn Dr. Matthias Sutter** für seine Dissertation „Der Stabilitäts- und Wachstumspakt in der Europäischen Währungsunion“,
- **Herrn Mag. Gabriel J. Felbermayer** für die Diplomarbeit „Currency Crises: Fundamentals or Sunspots? Recent Theory, Econometric Evidence and Policy Implications“,
- **Herrn Mag. Anish Gupta** für die Diplomarbeit „How to Beat the Random Walk: The German Mark and the Italian Lira“ und
- **Herrn Mag. Gabriel Moser** für die Diplomarbeit „Aggregate Demand Relations for European Credit and European Money as Indicators of the Monetary Policy of the European Central Bank“.



DIE VORTRAGENDEN



David E. Altig,

was born in 1956. His education includes a B.B.A., Economics, University of Iowa, 1980; an M.A., Economics, Brown University, 1982; a Ph.D., Economics, Brown University, 1987.

Currently holds the following positions: Vice President and Economist, Federal Reserve Bank of Cleveland; Adjunct Associate Professor in Business Economics, Graduate School of Business, University of Chicago; Lecturer, Department of Economics, Cleveland State University; Lecturer, College of Business, Kent State University; Visiting Professor of Economics, Henry B. Tippie School of Business, University of Iowa (2nd semester).

In the past, he was Chairman, Bank Management Committee, Federal Reserve Bank of Cleveland (1997 to 1999); Lecturer, Weatherhead School of Management, Case-Western Reserve University; Lecturer, Department of Economics and Finance, John Carroll University and Assistant Professor (August 1986 to May 1991) of Business Economics and Public Policy, Indiana University.

Mr. Urban Bäckström,

born in Sweden in 1954, and was appointed Governor of Sveriges Riksbank, the Swedish central bank on January 1, 1994. On January 1, 1999 he was appointed for another six year term, under the new legislation, as Chairman of the Executive Board and Governor of Sveriges Riksbank. Before being a Governor he was State Secretary of the Ministry of Finance with responsibility for Fiscal and Financial Affairs, which included the responsibility, under the minister, for the handling of the Swedish banking crisis in the early 1990s. Previously he has been President and C.E.O. of a company trading in bonds and shares in Stock-

holm, Chief Economist of the Conservative Party in Sweden, he has been on the board of a number of companies and institutions and has participated in various governmental inquiries. In his capacity as Chairman of the Executive Board and Governor of Sveriges Riksbank, he has been a member of the Governing Board of the Bank for International Settlements since 1994. On March 1, 1999 he was appointed President and Chairman of the Bank for International Settlements, BIS. He has also been representing Sweden as Governor of the International Monetary Fund.

J. Alfred Broaddus, Jr.,

received his B.A. degree from Washington and Lee University where he was elected to Omicron Delta Kappa and Phi Beta Kappa. Following graduation, he studied in France under a Fulbright Fellowship where he received a graduate degree from the Center for Advanced European Studies of the University of Strasbourg. After military service, he received his M.A. and Ph.D. degrees in Economics from Indiana University. He was awarded an honorary Doctor of Laws degree from Washington and Lee in 1993, and a Distinguished Alumnus Award from Indiana in 1996.

He joined the Bank's research staff as an economist in 1970, was named Assistant Vice President in 1972, Vice President in 1975, and Senior Vice President and Director of Research in 1985. He was promoted to his present position on January 1, 1993. In addition to his responsibilities at the Richmond Bank, he serves every third year as a member of the Federal Open Market Committee of the Federal Reserve System. He is also a member of the Federal Reserve System's Payments System Policy Advisory

Committee and Information Technology Oversight Committee.

He is the author of a number of articles on banking and monetary policy and has lectured at a number of colleges and universities. He is a member of the American Economic Association and the National Association of Business Economists.

Frank Browne,

is working at the European Central Bank since June 1998 as Advisor in the Directorate General Research. Before, he held the position of Deputy Head of Stage Three, Division of MESD, at the European Monetary Institute between November 1994 and June 1998. His previous assignments included Head of Research and Publications at the Central Bank of Ireland between April 1992 and November 1994 and economist at the OECD, Paris, between March 1998 and April 1992 as well as economist at the Central Bank of Ireland from 1972 to March 1988.

Franco Bruni,

graduated in "Economia e Commercio" at Bocconi University in 1971 and obtained a Master of Science in Economics at the Massachusetts Institute of Technology, in 1974. Since 1975 he has been teaching in the State University of Brescia and in Bocconi University. He has been visiting scholar at New York University and at UC-Berkeley and visiting professor at Chulalongkorn University, Bangkok. He is now Director of the Department of Economics of Bocconi University, and Full Professor of International Monetary Theory and Policy. He was the Director of the Master in International Economics and Management at the business school SDA-Bocconi from 1990 to 1995. He is member of the Scientific Committee of the

"Paolo Baffi" Centre for Monetary and Financial Economics, Deputy Director of ISPI (the Milan-based "Istituto per gli Studi di Politica Internazionale") and Vice President of SUERF (Société Universitaire Européenne des Recherches Financières, based in Amsterdam, the Netherlands). He has been a member of the working group "Neighbouring Countries" of the ECU Institute, country expert in the EU project on "The impact of Internal Market Integration on the banking and credit sector", member of the Committee of the "Deutsch-Italienisches Gesprächsforum", established by the German and Italian Foreign Affairs Ministries, member of the 1994 and 1995 Vienna December Round Tables of the Oesterreichische Kontrollbank Aktiengesellschaft. For many years he has been Economic Consultant for Credito Italiano where he is now a member of the Asset Allocation Committee, of the Working Group on global strategies and Chairman of the Board of Gesticredit spa, the bank's financial company for the management of mutual funds. He has been consulting for several companies and banks and has served on governmental and parliamentary commissions and study groups on the Italian banking and financial system. He is the author of many publications in the field of monetary economics and international finance. He is now concentrating on issues of central banking, prudential regulation, comparative financial systems and European monetary unification. He is referee for the European Economic Review, *il Giornale degli Economisti e Annali di Economia*, *la Rivista Internazionale di Scienze Economiche e Commerciali*, the Review of International Studies. He is also an organizer and contributor in many international conferences.

Jørgen Elmeskov,

studied at the University of Copenhagen, where he graduated as Masters of economics; the subject of his thesis was “Optimal control theory and macroeconomic planning”.

His professional experience includes the following positions: 1976 to 1981 research assistant, The Economic Council; 1981 Project post, Social Science Research Council (project on estimation of national wealth and its distribution); 1982 to 1986 economist, The Economic Council; 1983 to 1986 teacher, Copenhagen Business School; 1986 external lecturer, Copenhagen Business School; 1986 to 1995 Principal Administrator, OECD; 1995 to 1998 Counsellor for structural policy, including special responsibility for work on the Jobs Strategy (1995 to 1997); regulatory reform (1997 to 1998); and sustainable development and climate change (1997 to 1998); since 1999 Deputy Director, Policy Studies Branch, Economics Department; since 2000 Chairman, Editorial Board, OECD, Economic Studies.

Bernhard Felderer,

born in 1941 in Klagenfurt/Austria; studies at the Universities of Vienna 1960 to 1964 and Paris 1964 to 1966; in 1966 to 1967 research assistant at Princeton University, USA; in 1967 to 1968 visiting lecturer at the University of North Carolina, Chapel Hill, USA; 1968 to 1974 assistant at the Institute for Economic Policy and Research, University of Karlsruhe; in 1977 teaching and research in the USSR for a semester. 1974 to 1991 Professor of Economics in Cologne, 1991 to 1995 in Bochum. From 1991 onwards Director of the Institute for Advanced Studies (IHS), Vienna, and since 1995 Professor of Econom-

ics in Cologne. Comprehensive international activity as consultant for the Federal Government, for Ministries and associations in Germany and Austria; at the same time personal professional advisor of government members in Slovakia, Ukraine and Russia on topics of economics and social policy. Consultation of enterprises and non-governmental organisations (NGOs). Selected publications: “Macroeconomics and New Macroeconomics” (together with Homburg, S., Berlin etc. 1984, 6th edition 1994), “Bevölkerung und Wirtschaftsentwicklung” (together with Sauga, M., Frankfurt 1988; Population and Economic Development), “Public Pension Economics” (editor, Vienna 1993), “Forschungsfinanzierung in Europa” (together with Campbell, D., Vienna 1994, Research Financing in Europe). Referee in several scientific journals; from January 1, 2000 onwards Managing Editor of the newly-founded German Economic Review (GER), Blackwell Publishers. Since 1991 between 20 and 25 public lectures annually in Austria and abroad on topics of economics and economic theory.

Robert J. Gordon,

holds a Ph.D. from the Massachusetts Institute of Technology, 1967; he is Stanley G. Harris Professor in the Social Sciences. Among his many publications, two of his most recent pieces of work include “The Time Varying NAIRU and its Implications for Economic Policy,” *Journal of Economic Perspectives*, (1997) 11 : 1, 11–32; and “Foundations of the Goldilocks Economy: Supply Shocks and the Time-Varying NAIRU,” *Brookings Papers on Economic Activity*, (1998) 29 : 2, 297–333.

Robert J. Gordon is a macroeconomist with a particular interest in

unemployment, inflation, and both the long-run and cyclical aspects of productivity behavior. He has recently created new estimates of the time-varying NAIRU (natural rate of unemployment) for the United States, has provided an explanation for the decline of the NAIRU in the 1990s, and has extended this work to several major European countries. He recently served on a national advisory commission to assess the accuracy of the Consumer Price Index and has studied the role of measurement errors in prices and other official data series as a source of both the procyclicality of productivity and changes in its long-run growth rate.

Karl-Heinz Grasser,

born in 1969 in Klagenfurt as the son of parents who were both entrepreneurs. He completed his studies of applied business administration at Klagenfurt University within the shortest possible time, graduating in March 1992. By then he had already acquired extensive experience through a university-required one semester traineeship with a large, internationally operating firm of chartered accountants and tax advisors as well as through ongoing work in the family business of his parents. He joined the parliamentary group of the Freedomites in 1992, and was entrusted primarily with issues of European integration and tourism. As early as 1993, at the age of 24, he was appointed Secretary General of the Austrian Freedom Party and Managing Director of the Political Academy of the Austrian Freedom Party.

After the Carinthian Government elections in 1994, he became Second Deputy to the Governor of Carinthia and was assigned a wide range of responsibilities, such as business promotion, tourism, road

and bridge construction, building and civil engineering, transport, and trade and industry in Carinthia. He also acted as Vice President of the joint bidding syndicate of Carinthia, Friuli-Venetia Giulia, and Slovenia for the 2006 Olympic Winter Games.

On August 1, 1998, he was appointed Vice President for Human Resources and Public Relations of Magna Europe. In this capacity, he was responsible for all staff matters as well as internal and external communications of the 64 Magna Group locations in Europe. In 1999, he was also entrusted with the management of the Magna Group's affiliates Sport Management International (SMI) and Sportwetten GmbH. Until the end of 1999, he was a Board Member of the Sir Karl Popper Foundation, in which he still is a regular member. On February 4, 2000 he was appointed Minister of Finance, and is the youngest Minister of Finance in the history of the Republic of Austria.

Timo J. Hämäläinen,

born in 1964 in Helsinki, Finland. Received a Ph.D. in International Business from Rutgers University, New Jersey, in 1999. His dissertation was titled "A Systemic Framework of Economic Competitiveness and Growth". Also holds an M.B.A. from Rutgers University (1993) and a M.Sc. from the Helsinki School of Economics and Business Administration (1987).

He is currently the development manager of the Finnish National Fund for Research and Development, Sitra, which finances policy-oriented socio-economic research, undertakes venture capital investments in small start-up firms and provides future-oriented training for top Finnish decision takers. In Sitra, he is responsible i.a. for the

research programme on the Finnish innovation system. In the mid-1990s, he was planning the new strategy for Finnish industrial policy at the Ministry of Trade and Industry. In 1996, he spent a few months as a visiting scholar at the Directorate of Science, Technology and Industry of the OECD in Paris. He has also working experience in investment banking and international portfolio management from the late 1980s.

Helmut Kramer,

born in 1939. Is Director of the Austrian Institute of Economic Research, Vienna. Between 1958 and 1963 he studied law and economics at the University of Vienna and obtained his Ph.D. in law in 1963. Since 1981 he is Director of the Austrian Institute of Economic Research, after having been Deputy Director of the Institute for 10 years and Economist at the same institute for another 10 years. His other professional activities include: since 1972 Lecturer at the University of Economics, Vienna; since 1989 Professor for Austrian economic policy at the University of Vienna; Member of the Board of the Austrian Economic Association and of the Vienna Institute for Comparative Economic Studies; Head of the Board of the Vienna Social and Economic Sciences Computing Centre (WSR).

Iwao Kuroda,

born in 1943. Is Executive Director, Bank of Japan. His professional career comprises the following positions: April 1966 Staff of the Bank of Japan; May 1988 Adviser, Coordination and Planning Department; February 1991 Deputy Director, Financial and Payment System Department; October 1994 Director, Institute for Monetary and Economic Studies; April 1998 present position.

His activities with international organizations include: 1983 to 1985 United Nations, UNCITRAL, Study Group on International Payment; 1982 to 1986 Member of the Committee on Payment and, 1988 to 1994 Settlement Systems, BIS; 1992 to 1994 Member of the Basel Committee on Banking Supervision, BIS.

He holds a B.A. of Economics, University of Tokyo. Between 1979 and 1981 he was Associate Professor in Economics, University of Tsukuba, in 1982 he was Visiting Lecturer at the University of Tokyo.

Klaus Liebscher,

born in 1939. Is presently serving as Governor of the Oesterreichische Nationalbank (OeNB). Since the foundation of the European Central Bank (ECB) in June 1998 he has been an independant member both of the ECB Governing Council and the ECB General Council. He also represents the OeNB at the Bank for International Settlements (BIS) Governors' Meeting and is Austria's Governor to the International Monetary Fund (IMF). Before he joined the OeNB on June 1, 1995 – then presiding the General Council of the Bank as its President until August 31, 1998 – he started at the Raiffeisen Zentralbank Österreich AG in 1968, where he was a member of the Executive Board since 1980 and Chief Executive Officer and Chairman of the Board from 1988 to 1995. He served as President of the Vienna Stock Exchange Council from 1990 to 1995 and on the supervisory boards of several banks and other corporations in Austria and abroad. He earned his law degree (Dr. iur.) at the University of Vienna.

Allan H. Meltzer,

is Professor of Political Economy and Public Policy at Carnegie Mellon University and, since 1989, also a Visiting Scholar at the American Enterprise Institute in Washington. He has been a Visiting Professor at Harvard, University of Chicago, University of Rochester, the Yugoslav Institute for Economic Research, the Austrian Institute for Advanced Studies, the Getulio Vargas Foundation in Rio de Janeiro and the City University, London. He has served as a consultant for several Congressional committees, the President's Council of Economic Advisers, the U.S. Treasury Department, the Board of Governors of the Federal Reserve System, the World Bank, foreign governments and central banks. He has been a member of the President's Economic Policy Advisory Board. In 1988 to 1989, he was an acting member of the President's Council of Economic Advisers. Since 1987, he has been Honorary Adviser to the Institute for Monetary and Economic Studies of the Bank of Japan.

His writings have appeared in numerous journals, including the business press here and abroad. He is the author of several books and more than 250 papers on economic theory and policy. From 1973 to 1996, he was co-editor of the Carnegie-Rochester Conference Series on Public Policy. He has served as associate editor of the *Journal of Economic Literature*, the *Journal of Finance*, and the *Journal of Monetary Economics*. His career includes experience as a self-employed businessman, management adviser, and consultant to banks and financial institutions. In 1983, Professor Meltzer received a medal for distinguished professional achievement from the University of California, Los Angeles. He is a past

president of the Western Economic Association and a Fellow of the National Association of Business Economists.

Jørgen Birk Mortensen,

born in 1941. He earned his M.Ec. with specialisation in economic growth and development theory at the University of Copenhagen in 1969. There after, he was Associate Professor (3 years research on top of a Ph.D. equivalent degree), Institute of Economics, Copenhagen University.

He has worked as researcher, teacher and consultant in environmental and natural resource economics, energy economics, development economics macro and micro economics in a number of countries (India, Vietnam, Thailand, Singapore, Uganda, Zimbabwe, Ghana, U.S.A.).

His professional experience includes: since 1998 Chairman, The Danish Economic Council; 1982 to 1992 Vice Chairman, Institute of Economics, Copenhagen University; since 1974 Lecturer (Associate Professor), Institute of Economics, Copenhagen University; 1973 to 1974 Visiting Scholar, Department of Economics, University of California, Berkeley, U.S.A.

In addition he held the following positions: 1985 to 1993 Chairman, Committee for Ph.D.-studies, Institute of Economics, Copenhagen University; 1990 to 1992 Member of the European Science Foundation Task Force on Evaluation of Environmental Policy; 1982 to 1985 Danish representative in International Association of Energy Economists; 1987 to 1993 Member of the Research Group for the Public Sector and the Economy (financed by the Danish Social Science Foundation); since 1992 Member of board of management of the research centre

“Society, Economics and Environment”, Copenhagen and Member of the board of management of the research centre “Environment and Economics”, Copenhagen; 1996 to 1999 Danish expert partner in EU project “Green Taxes: Environment, Employment and Growth”; since 1997 Project leader for “Informational problems in environmental resource regulation: Compliance and enforcement of regulation of common resources”, financed by The Danish National Environmental Research Program, Project leader for “Sustainability concepts and analysis”, financed by The Danish National Environmental Research Program, Danish member of “Energy and Society”, The Nordic Energy Research program; since 1999 Chairman for “Energy and Society”, The Danish Energy Research Program.

Wolfgang Polt,

is Head of Joanneum Research Institute in Vienna. His main fields of activity are technology policy and evaluation, and national innovation systems.

He studied economics and business informatics at the University of Vienna and graduated in Economics in June 1985.

His professional experience includes the following steps: 1985 to 1992 Research Fellow at the Institute for Research on Socio-Economic Development and Technology Assessment of the Austrian Academy of Sciences; 1989 Research scholarship at the International Institute for Applied Systems Analysis (IIASA) Laxenburg/Vienna; 1991 Research scholarship at the Research Institute of the Finnish Economy (ETLA) for cooperation in a project on “Technology Diffusion”; 1992 to 1999 Senior Research Fellow at the Department of Technology Studies of the Austrian

Research Center Seibersdorf; 1990 to 1993 Lecturer for Macroeconomics at the University of Linz/Austria; since 1992 Lecturer for industrial and technology policy at the University of Business and Economics in Vienna; 1996 to 1998 full-time consultant for the OECD/Directorate for Science, Technology and Industry/Division for Science and Technology Policy in Paris; since February 2000 Head of the Viennese office of the Institute of Technology and Regional Policy (InTeReg) and of the Viennese office of Joanneum Research.

Claus J. Raidl,

born at Kapfenberg/Styria in 1942. He has been Chairman and CEO of BÖHLER-UDDEHOLM AG. since 1991. Besides, he is member of the Supervisory Boards within the BÖHLER-UDDEHOLM-group and also member of Supervisory Boards of companies outside the BÖHLER-UDDEHOLM-group.

He studied between 1961 and 1966 at the University for Economics and Business Administration of Vienna, where he obtained his M.B.A. and Ph.D.

His professional experience includes the following steps: 1970 to 1971 Assistant at the Institute for Social and Economic Research in Vienna; 1972 to 1974 banking experience, employed at a CPA, consultant at the OECD in Paris (for international tax laws and the multinational firm); 1974 to 1981 insurance company (Österreichische Volksfürsorge Allgemeine Versicherungs-AG); 1981 to 1982 Member of the Executive Board of the Viennese Holding Company (Wiener Holding); 1982 to 1986 Member of the Executive Board of ÖIAG (the Holding Company of state-owned Austrian Industries); 1986 to 1988 Deputy Chairman and Senior Execu-

tive Vice President of VOEST-ALPINE AG; 1986 to 1992 Deputy Chairman and Senior Executive Vice President of VOEST-ALPINE STAHL AG; 1993 to 1994 Member of the Executive Board of Austrian Industries.

His publications include "The Value Added Tax and the Price Level" (Vienna, 1971) as well as articles on current economic affairs and financial issues in economic journals and magazines.

Joseph P. Rooney,

is a Managing Director in charge of Lehman Brothers Global Equity Strategy. He graduated at University College Dublin, at the end of 1984, with a M.B.S. in banking and finance and a B.A. in economics. After spending 8 years with James Capel in various research capacities, he joined Lehman Brothers in February 1993 as pan European equity strategist. In September 1995 he took on responsibility for global strategy. He has been ranked in the top 3 of institutional client polls for a number of research fields and his 1998 Valuation Framework was a specifically noted research piece in the 1999 Extel Survey. In 1999 he was appointed a trustee of the Lehmann Brothers pension scheme.

Vicente Salas Fumás,

is Ph.D. (Management Science) and Professor of Business Economics at the University of Zaragoza, Spain. Previously has been Professor at the Universidad Autonoma of Barcelona and visiting scholar at Stanford University. His research interests are in the economic analysis of organisations. From 1994 to 1998 was member of the Board of Directors of the Bank of Spain, and in 1992 was awarded the prize Jaime I for his contributions to the research on the economics of the firms.

Wolfgang Schüssel,

born in Vienna in 1945. Following his elementary schooling, he attended a well-known classical grammar school in Vienna (the "Schottengymnasium") where he took his secondary school leaving certificate in 1963. He went on to study at Vienna University and received a Doctorate in Law in 1968. He was secretary of the parliamentary group of the Austrian People's Party (ÖVP) from 1968 to 1975; from 1975 to April, 1991, he was Secretary General of the Austrian Business Federation, a sub-organisation of the People's Party. On April 24, 1989, he became Minister for Economic Affairs in the coalition government formed by the Austrian Social Democratic Party (SPÖ) and the People's Party under Chancellor Franz Vranitzky. At the 30th Party Congress of the ÖVP, he was elected national leader of the Party on April 22, 1995. On May 4, 1995, he was sworn in as Vice-Chancellor and Federal Minister for Foreign Affairs in Franz Vranitzky's fourth government. He held the same posts in Chancellor Vranitzky's fifth Cabinet. In Chancellor Klima's first government, from January 28, 1997, to February 4, 2000, he was again Vice Chancellor and Federal Minister for Foreign Affairs. On February 4, 2000, he was sworn in as Federal Chancellor.

Pedro Solbes Mira,

born in 1942 in Pinoso (Alicante). His education includes a Doctorate of Political Sciences, University of Madrid, a Bachelor of law, University of Madrid and a Diploma in European Economics, Université Libre de Bruxelles.

His professional career includes the following main parts: 1968 civil servant, Ministry of Foreign Trade; 1973 Commercial Counsellor,

Spanish Mission to the European Community; 1978 Special Adviser to Minister for Relations with the European Community; 1979 to 1982 Director General of Commercial Policy, Ministry of Economics and Trade; 1982 to 1985 General Secretary, Ministry of Economics and Finance. Member of task force for Spanish accession negotiations to the European Community; 1989 President of Internal Market Council during first Spanish Presidency of EC; 1985 Secretary of State for Relations with the EC; 1991 to 1993 Minister of Agriculture, Food and Fisheries; 1993 to 1996 Minister of Economics and Finance; 1995 President of ECOFIN Council during Spanish Presidency of EU; 1996 Member of the Spanish Parliament; 1996 President, Joint Committee of the Spanish Parliament on the European Union; since September 1999 Member of the European Commission, Economic & Monetary Affairs. He also is Invited Professor at the University of Alicante.

Shigemitsu Sugisaki,

born in 1941. Assumed office as Deputy Managing Director of the International Monetary Fund on February 3, 1997, has a B.A. from the University of Tokyo (1963) and a Masters of International Affairs from Columbia University (1967). He joined Japan's Ministry of Finance in 1964 as a member of the Minister's Secretariat. He held various positions in the International Finance Bureau and the Tax Bureau, and was appointed Personal Assistant to the President, Asian Development Bank in 1976. He rejoined the Ministry of Finance in 1979, holding a number of positions, including that of Deputy Vice Minister of Finance for International Affairs in 1990 to 1991, Deputy Director General of the International Finance Bureau in

1991 to 1992, and Commissioner of the Tokyo Regional Taxation Bureau in 1992 to 1993. From mid-1993 until July 1994, he held the position of Secretary-General of Executive Bureau, the Securities and Exchange Surveillance Commission. He was appointed Special Advisor to IMF Managing Director in August 1994.

Andreas Treichl,

born in Vienna in 1952. Studied economics at Vienna University from 1971 to 1975. After completing a training programme in New York, he started his career in 1977 with Chase Manhattan Bank, with postings to Brussels (1979 to 1981) and Athens (1981 to 1983). In 1983 he joined Die Erste for the first time. In 1986 he moved to take up the post of Chief Executive Officer (CEO) at Chase Manhattan Bank, Vienna, which was bought by Credit Lyonnais in 1993. In 1994 he was appointed to the Managing Board of Die Erste. In July 1997 he was appointed CEO. In August 1997, the shareholders approved the merger between Die Erste and GiroCredit, in which Die Erste had acquired a majority stake in March 1997. The merger was formally completed on October 4, 1997, when it was entered into the Companies Register, and had retroactive effect from January 1, 1997. The integration of the business and operations of the two banks started immediately and has already been completed in all principal areas. In addition to his responsibilities as Chairman and CEO of the new Erste Bank, he is – among others – in charge of private and trade clients, the branch network, savings bank policy and group communications. He is chairman of the supervisory board of S-Versicherung, Austria's fastest growing life insurer, S-Bausparkasse.

Gertrude Tumpel-Gugerell,

born 1952 in Killing, Lower Austria. Graduated 1971 with honors from high school in St. Pölten and 1975 with honors from the University of Vienna with a master's degree in economics and social sciences. Joined 1975 the Economics Department of the Oesterreichische Nationalbank, attended 1980 the Financial Analysis and Policy Training Program of the International Monetary Fund, received 1981 a doctorate of economics and social sciences.

She worked from 1981 to 1984 as the economic policy advisor to the Minister of Finance, was a member of the Supervisory Board of Österreichische Länderbank AG. In 1985 she was appointed Deputy Head of the Economics of the OeNB and became in 1986 Comptroller General and put in charge of developing strategic planning and auditing. From 1990 she has represented the OeNB in economic and social science research institutes, was appointed 1992 Director of the Area Corporate Planning and Management at the OeNB. From 1996 she has been in charge of coordinating the preparations of the OeNB for EMU, was appointed 1997 Chief Executive Director of the Economics and Financial Markets Department and became in September 1998 Vice Governor of the OeNB.

She is a member of the Council for the Foundation of Fachhochschulen (specialized institutions of higher education) in Austria, the International Relations Committee and the Banking Supervision Committee of the ECB, the Economic and Financial Committee and Vice Chairperson of the Banking Advisory Committee.

Georg Winckler,

born in 1943. He is currently Rector of the University of Vienna. He studied at Princeton University, Princeton, N.J./U.S.A. and at University of Vienna (Ph.D., 1968).

His professional career included the following steps: 1967 Oesterreichisches Institut für Wirtschaftsforschung (Wifo), Wien (part-time); 1968 to 1971 Univ. Assistent, Institut für Wirtschaftswissenschaften, Universität Wien; 1971 to 1972 membre du cadre, Pont-à-Mousson S.A. (Saint Gobain S.A.), Nancy/France; 1972 to 1975 Univ. Assistent and Univ. Lektor, Universität Wien; 1976 to 1978 Univ. Dozent, Universität Wien; 1977 to 1978 Visiting Professor at Universität Graz/Austria and Université Fribourg/Switzerland; since 1978 (Full) Professor of Economics, Universität Wien; 1980 to 1982 Head of Department; 1985 to 1986 (fall term) Visiting Professor at Universität Linz/Austria; September 1990 to January 1991 Visiting Scholar, Research Department, International Monetary Fund, Washington D.C./U.S.A.; 1992 to 1993 (fall term) Visiting Professor at Universität Linz/Austria; 1994 to 1999 Director, Center for International and Interdisciplinary Studies (Zentrum für Internationale und Interdisziplinäre Studien/ZIIS), Universität Wien; 1995 (fall term) Visiting Professor of Economics at Georgetown University, Washington D.C./U.S.A.; 1998 (spring term) Visiting Professor of Economics at University of Bratislava, Slovakia.

His other activities included inter alia: 1978 to 1985 General Secretary, Austrian Economic Association; 1985 to 1999 Vice President, Austrian Economic Association; 1990 to 1998 member of the board of SUERF (Société Universitaire Européenne de Recherches Finan-

cières), Netherlands; 1993 to 1996 member of the Council of Scientists, INTAS-International Association for the Promotion of Cooperation with Scientists from the New Independent States of the former Soviet Union, European Commission, Brussels; 1995 to 1999 member of the TRM Panel, European Commission, Brussels.

He was Speaker and/or Chairman at Conferences of the International Monetary Fund (April 1991, October 1992, June 1993, October 1994), European Free Trade Association/EFTA (mission in Bulgaria: June 1994), OECD (May 1996), Euromoney Conferences (England), CEPR conferences etc.

He has published several books and numerous articles in international journals.

Stefan Zapotocky,

born in Vienna in 1952. He studied Mathematics for Economics and Planning at the Vienna Technical University and has awarded degree in engineering in 1975 and a doctorate in 1981. He was Assistant to the Head of Personnel at Erste Österreichische Spar-Casse-Bank between 1976 and 1980, then became Head of Strategic Planning (1980 to 1985), Head of New Issues department (1985 to 1988), and Securities Division/New Issues at Österreichische Länderbank AG (1988).

In 1989 he became Managing director of LB-Capital Markets. Since October 1991 he is Senior General Manager and Head of former Securities Division, now Asset Management Division at Bank Austria Aktiengesellschaft.

His additional positions included Chairman of the supervisory board, Capital Invest, Chairman of the supervisory board, Asset Management Gesellschaft, Member of the managing board, Notar & Treuhand-

bank, Member of the managing board, Bank Austria Kunstforum, Member of the supervisory board, Immotrust Anlagen Aktiengesellschaft, Member of the supervisory board, Ringturm Kapitalanlagegesellschaft m.b.H., Member of the supervisory board, BA-Industrieholding Gesellschaft m.b.H., Member of the supervisory board, Union Versicherungs-AG.

He is Lecturer at the Vienna University of Management and Business Administration.

Since April 2000 he is Member of the Executive Board at Wiener Börse AG.

Josef Zechner,

born in 1955. Ph.D. and Habilitation at the Karl Franzens University in Graz. In 1985 he joined the Faculty of Business Administration of the University of British Columbia as Assistant Professor of Finance. In 1990 he was promoted to Associate Professor with Tenure. From 1991 to 1992 he was visiting Scholar at the Graduate School of Business at Stanford. Since 1993 he is Professor of Finance at the Department for Business Studies of the University of Vienna. He is Research Fellow of the Center for Economic Policy Research (CEPR) and was President of the European Finance Association in 1998. He is currently a member of the advisory board of the German Finance Association and designated Program Chair for the annual conference of the German Finance Association in 2001. He is on several editorial boards and has published articles in leading finance and economics journals. His research interests focus on issues in corporate finance and banking, in particular on questions related to corporate governance, initial public offerings, bank regulation and risk management.

Eigentümer, Herausgeber und Verleger:

Oesterreichische Nationalbank

Für den Inhalt verantwortlich:

Wolfdietrich Grau, Sekretariat des Direktoriums/Öffentlichkeitsarbeit

Redaktion:

Karin Fischer, Beatrix Kossinowsky, Christiana Weinzettel,

Abteilung für volkswirtschaftliche Analysen

Grafische Gestaltung:

Peter Buchegger, Sekretariat des Direktoriums/Öffentlichkeitsarbeit

Hannes Jelinek, Hausdruckerei

Fotografien:

Ulrich Schnarr

Satz, Druck und Herstellung:

Hausdruckerei

Rückfragen:

Oesterreichische Nationalbank

Sekretariat des Direktoriums/Öffentlichkeitsarbeit

Wien 9, Otto-Wagner-Platz 3

Postanschrift: Postfach 61, A-1011 Wien

Telefon: (+43-1) 404 20 DW 6666

Telefax: (+43-1) 404 20 DW 6696

Nachbestellungen:

Oesterreichische Nationalbank

Abteilung für Post- und Aktenwesen

Wien 9, Otto-Wagner-Platz 3

Postanschrift: Postfach 61, A-1011 Wien

Telefon: (+43-1) 404 20 DW 2345

Telefax: (+43-1) 404 20 DW 2399

Internet:

<http://www.oenb.at>

Papier:

Salzer Demeter, 100% chlorfrei gebleichter Zellstoff, säurefrei, ohne optische Aufheller

DVR 0031577

Wien 2000