Monetary Policy & the Economy

Quarterly Review
of Economic Policy

Q1/04

Contents

Opinions expressed by the authors of studies do not necessarily reflect the
official viewpoint of the OeNB.

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Editorial

Dear readers,

We are proud to present to you the first issue of our new economic policy quarterly "Monetary Policy & the Economy." Sporting a brandnew structure and design, this bulletin replaces the "Focus on Austria" series that up to now — together with a number of more specialized publications — served as the flagship information product of the Oesterreichische Nationalbank (OeNB) on issues regarding both economics and economic policy.

A substantial review of the OeNB's quarterly economic series had appeared appropriate for a number of reasons. First of all, the concept behind "Focus on Austria" dated back more than 13 years — a remarkable period of time characterized by profound changes, both in institutional settings and economic policy orientation, ranging from the fall of the Berlin wall in 1989, Austria's EU entry in 1995 and the implementation of Stage Three of Economic and Monetary Union (EMU) to the accession of ten new Member States to the European Union on May 1, 2004. In short, the economic framework conditions have changed tremendously since the beginning of the 1990s, both for Europe in general and for monetary policy in particular.

Compared with "Focus on Austria," the new "Monetary Policy & the Economy" series was restructured, downsized in volume and its overall layout was modernized. The main objectives of the redesign process were to increase customer orientation, to focus even more strongly on the readership's interests and to establish a distinct profile among the OeNB's economic publications. A new editorial policy, supported by an editorial board and editors in chief, will help produce a high-quality series. Moreover, the OeNB aims at publishing the German and English versions of the new series simultaneously.

Of course the changing framework conditions mentioned earlier also had had an impact on the technical orientation of "Focus on Austria," whose focus was gradually broadened to accommodate European topics as well. In addition, the OeNB began to release special issues dedicated to specific topics ranging from monetary policy to the effects of EU enlargement, thus paying tribute to its new role within the monetary union. Moreover, the OeNB introduced additional periodical publications, such as "Focus on Transition" (launched in 1996, with a focus on eastern Europe) and the "Financial Stability Report" (first published in 2001).

In redesigning its flagship publication, the OeNB also drew on the results of a survey carried out among the readers of "Focus on Austria," who we would like to thank for their positive and highly encouraging feedback and for a host of creative ideas. "Monetary Policy & the Economy" has been conceived as a publication that, on a sound scientific basis, discusses current economic policy issues for an audience with an interest in economics reaching beyond the narrow circle of economics experts. This broader focus serves to highlight the important twin function that characterizes the economic analysis and research activities of a national central bank participating in the Eurosystem. In this capacity, the OeNB is called upon, on the one hand, to make the best possible contribution to the economic analyses underlying economic policy decisions and, on the other hand, to act as an interface between the Eurosystem's single monetary policy and both national policymakers and the Austrian public.

By presenting highly topical discussions on specific economic policy issues — such as the determinants of growth, the role of inflation differentials in Europe and the influence of new payment instruments on cash demand — this first issue of "Monetary Policy & the Economy" patently illustrates the key elements of the new concept. Moreover, at the beginning of every new issue, readers will find a comprehensive review of recent economic developments at the international, European and national level, with issues 2 and 4, respectively, also including the OeNB's semiannual economic forecast for Austria. On the occasion of EU enlargement, in this first issue particular attention is given to the new Member States. Finally, we would like to point out that the OeNB will, of course, continue its in-depth analysis of key topics; such analyses will be published in a newly designed, tailor-made "Workshop Series."

As was the case also for "Focus on Austria," the new quarterly bulletin will be available both in English and in German ("Geldpolitik & Wirtschaft"). As of mid-2004 all OeNB publications will be accessible on the OeNB's redesigned website.

We hope you will find the "Monetary Policy & the Economy" series interesting and that you will continue to enjoy reading this publication. Please do not hesitate to send us your feedback, criticism and suggestions for improvement.

Klaus Liebscher
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Subdued Economic Activity in the Euro Area and in Austria despite International Recovery

Gerhard Fenz,
Thomas Gruber,
Wolfgang Pointner

Editorial close:
April 19, 2004

At the worldwide level, economic recovery appears to be picking up even more momentum. The U.S. has seen sharp increases in growth given the strong impetus from consumer spending and investment. In Asia, Japan seems to have ended its long period of economic recession, and the Chinese and Southeast Asian economies have continued to expand rapidly. The growth outlook has also improved for Eastern Europe. At the same time, however, economic recovery is still moderate in the euro area, and it appears that the risks have increased more than they have decreased. The positive effects of robust international demand are being offset by the subduing effect of the euro's rally, and domestic demand – especially consumer spending – has recently been less dynamic than expected. However, the inflation outlook is still assessed as favorable. Since the beginning of 2004 inflation in the euro area has been below 2% and is expected to remain at this low level.

For Austria, economic development in the first half of 2004 is currently forecast with cautious optimism, although the data recently released for the second half of 2003 clearly did not live up to expectations. This is another reason why the situation in the Austrian labor market is still tight and not expected to improve in the first half of this year. Inflation will remain at its current low level.

So far, the most striking event in 2004 has been the May 1 enlargement of the European Union to include ten new Member States. For most of the new members, acceding to the EU represents the climax of a political and economic transformation process, which had begun in 1989 and has generally been highly successful. The enlargement, adding another 74 million people to the EU's population, was also a unique event for the EU itself. In economic terms, we can expect the enlargement to have positive effects on medium-term growth throughout the EU. At the same time, new challenges have arisen regarding the monetary integration of these countries and the redefinition of the EU's policy on neighboring countries (proximity policy).

1 EU Takes on Ten New Member States

On May 1, 2004, ten new Member States – Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia – joined the European Union (EU). This enlargement was the most significant ever in terms of the number of countries and their total population (74 million, or 20% of the EU-15). The nominal gross domestic product (GDP) of the new Member States, however, is only about 5% of the EU-15's GDP.

1.1 Successful Transformation in Central and Eastern Europe

Since the fall of the Iron Curtain in 1989, the countries of Central and Eastern Europe (CEE) have been faced with a barrage of new challenges. Their governments have been confronted with the formidable tasks of implementing democratic political reforms and transforming those countries into market economies at the same time.

This political and economic upheaval gave rise to a profound shock due to reforms, which meant that the first years of transformation were characterized by shrinking economies. In the course of the ensuing economic catching-up process, the per capita income of Central and Eastern European countries (CEECs) has risen considerably in relation to the EU average (measured in terms of purchasing power parity), now reaching approximately 50%. In 2003, preliminary estimates put real economic growth in CEECs at +3.6%, which is markedly higher than the 0.6% GDP growth in the EU-15.

Likewise, inflation has also stabilized at a low level in most of the new Member States. At the beginning of the transformation process, some of these countries saw annual inflation rates as high as 70% (in 1990, Poland

Chart 1

GDP per Capita at Purchasing Power Parity

% of EU average
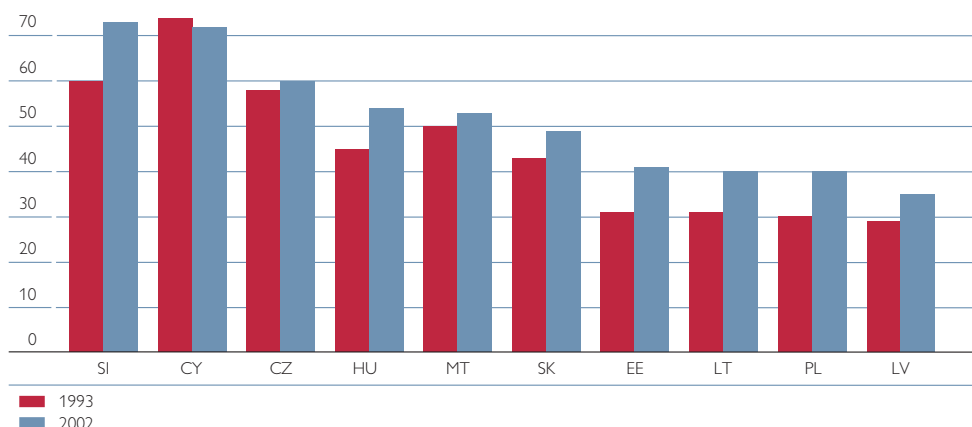
Source: European Commission, ECB.

Table 1

Economic Development Indicators in the New Member States

	Real GDP growth			Inflation (HICP)			Unemployment (LFS)		
	2001	2002	2003[1]	2001	2002	2003	2001	2002	2003[1]
	%								
Poland	1,0	1,4	3,3	5,4	1,9	0,7	18,5	19,9	20,6
Slovakia	3,8	4,4	3,8	7,0	3,3	8,8	19,4	18,6	17,7
Slovenia	2,9	2,9	2,1	8,6	7,5	5,7	5,8	6,0	6,4
Czech Republic	3,1	2,0	2,2	4,6	1,4	−0,1	8,0	7,3	7,8
Hungary	3,8	3,5	2,9	9,1	5,3	4,7	5,6	5,6	5,6
Estonia	6,5	6,0	4,4	5,6	3,6	1,4	11,8	9,1	8,6
Latvia	7,9	6,1	6,0	2,5	2,0	2,9	12,9	12,8	12,4
Lithuania	6,5	6,8	6,6	1,3	0,5	−1,0	16,1	13,1	12,3
Malta	−1,2	1,7	0,8	2,9	2,2	1,3	6,7	7,4	7,0
Cyprus	4,0	2,0	2,0	2,0	2,8	4,0	4,5	3,8	3,9
AC-10	2,4	2,4	3,1	5,8	2,7	2,0	14,5	14,8	14,3
EU-12	1,6	0,9	0,4	2,3	2,3	2,1	8,0	8,4	8,8
EU-15	1,7	1,0	0,6	2,2	2,1	2,0	7,4	7,7	8,0

	Budget balance			Government debt			Current account		
	2001	2002	2003[1]	2001	2002	2003[1]	2001	2002	2003[1]
	% of GPD						%		
Poland	−3,5	−3,6	−4,3	37,3	41,7	45,1	−2,9	−3,5	−2,9
Slovakia	−6,7	−7,2	−5,1	47,1	42,6	45,1	−7,4	. .	−3,8
Slovenia	−2,7	−2,5	−2,2	26,5	27,4	27,4	0,1	1,7	0,5
Czech Republic	−6,4	−6,7	−8,0	26,1	27,1	30,7	−6,2	−5,3	−6,6
Hungary	−4,7	−9,4	−5,4	53,5	57,1	57,9	. .	−4,0	−6,2
Estonia	0,2	1,3	0,0	4,7	5,7	5,4	−6,0	−12,3	−15,2
Latvia	−1,6	−3,0	−2,7	15,7	15,1	16,7	−9,6	−7,8	−8,6
Lithuania	−1,9	−1,4	−2,6	23,4	22,8	23,3	−4,8	−5,4	−5,7
Malta	−6,8	−6,2	−7,6	65,9	66,5	66,4	. .	. .	−6,6
Cyprus	−3,0	−3,5	−5,2	64,3	58,6	60,3	−4,0	−5,3	−4,4
AC-10	−3,8	−4,8	. .	36,7	39,8	42,4	. .	. .	−4,6
EU-12	−1,6	−2,3	−2,8	69,2	0,7	70,4	−0,3	0,8	0,6
EU-15	−0,9	−1,9	−2,7	62,8	62,5	64,1	−0,4	0,5	0,2

Source: Eurostat, OeNB.
[1] Forecasts: European Commission: autumn 2003 forecast.

even recorded an inflation rate of 585%). Now the average annual inflation rate in the new Member States has reached the same level as in the euro area. In several countries, e.g. Poland, inflation is considerably lower, and some countries, including Lithuania and the Czech Republic, even post negative inflation rates.

The situation on the labor market is still difficult in some countries, with declining employment and rampant joblessness.

In addition, increased efforts to consolidate national budgets are necessary in a number of countries. One significant problem is that some of the new Member States have very high current account deficits, which, however, are largely covered by inflows of foreign direct investment. Even if this situation is typical of economies in transition, it also involves risks which should not be underestimated.

Overall, the new Member States have proven to be extremely successful in their ongoing process of transformation. By establishing democratic constitutional states, creating functioning market economies as well as adopting and implementing the EU's *acquis communautaire,* these countries have fulfilled the requirements for EU accession.

1.2 Future Proximity Policy

One important issue in the enlarged EU is that of defining its relations to neighboring countries after the enlargement.

A concrete schedule has been drawn up for Romania and Bulgaria, with accession targeted in 2007. Ongoing negotiations on the EU entry of these two countries should be completed in 2004. With regard to Turkey, the European Commission will submit its opinion to the European Council in October 2004. Should this opinion be favorable, the EU has assured the Turkish government that accession negotiations will begin immediately. The EU has also held out the prospect of membership to countries in the Western Balkans. Croatia is the most advanced of these countries and has already submitted an application for membership.

For relations with those countries which will not be offered EU membership in the foreseeable future, the European Commission has developed a new strategy under the title of "Wider Europe." These countries include Russia, the Ukraine, Moldavia and Belarus as well as the entire Mediterranean region. Given appropriate progress in reforms, these countries are to be allowed access to the Single Market.

EU Enlargement and the ESCB

On May 1, 2004, the central banks of the new Member States also joined the European System of Central Banks (ESCB), which now consists of the European Central Bank (ECB) and the 25 national central banks (NCBs). Therefore, the governors of the new Member States' NCBs are now members of the General Council of the ECB. The General Council will serve as a transitional body until all EU Member States have introduced the euro. Currently the General Council meets four times per year. The Eurosystem, on the other hand, which has not yet been affected by the enlargement of the EU, still comprises the ECB as well as the NCBs of those 12 Member States which have already adopted the euro. The new Member States will not be represented in the Governing Council of the ECB (the Eurosystem's main decision-making body) until they have introduced the euro in accordance with the relevant criteria.

1.3 Three Stages of Future Monetary Integration

The accession date of May 1, 2004, marked the beginning of the monetary integration process for the new Member States. These countries are generally obliged to strive toward the eventual adoption of the euro. However, they must first undergo a multi-stage process involving accession to the EU, participation in the new exchange rate mechanism ERM II, and finally the fulfillment of the Maastricht convergence criteria.

Stage 1: EU Accession

In acceding to the EU, the new Member States have also joined Economic and Monetary Union (EMU), even if they are not able to adopt the euro right away. This means cooperation in the coordination of EU economic policy, an obligation to draw up convergence programs, adherence to the Stability and Growth Pact (especially with regard to budgetary discipline) and membership of their NCBs in the ESCB.

The new Member States are obliged to treat their exchange rate policies as "a matter of common interest," which means avoiding excessive nominal fluctuations and distortions of the real exchange rate. A side from this obligation, decisions on monetary policy strategy and the exchange rate regime are left up to each individual Member State.

Stage 2: Exchange Rate Mechanism II (ERM II)

Since May 1, 2004 each new Member State has had the right – but not the obligation – to apply for membership in ERM II. ERM II is a multilateral arrangement in which currencies of non-euro area Member States are pegged to the euro. Its objectives include supporting stability-oriented economic policies, promoting convergence and protecting foreign exchange markets from unjustified pressure.

The main features of ERM II are a fixed but adjustable central rate against the euro, a standard fluctuation band of ±15%, the possibility of intervening within the band and a bilateral obligation to intervene at the margin as long as the primary objective of price stability is not compromised.

Country	Exchange rate regime	Monetary policy
Estonia Lithunia	Currency board to the euro	Exchange rate targets
Latvia Malta	Peg to currency baskets with narrow fluctuation bands: Latvia (SDR basket), Malta (euro, U.S. dollar, pound sterling)	Exchange rate targets
Cyprus Hungary	Peg to the euro with wide fluctuation bands (±15%).	Direct inflation targets
Czech Republic Slovakia Slovenia	Managed Float	CZ: direct inflation targets SK, SI: multi-indicator monitoring
Poland	Free Float	Direct inflation targets

The decision as to when to join ERM II is generally left to the discretion of the new Member States, and the appropriate time will be assessed individually for each country. Although there are no formal criteria for entry into ERM II, the central rate and the width of the fluctuation band are subject to multilateral agreement before a country can participate. However, the Eurosystem considers certain exchange rate regimes to be incompatible with ERM II, including free floating, crawling pegs and pegs against anchors other than the euro. Currency board arrangements[1] can be retained in the form of unilateral obligations.

Stage 3: Adoption of the Euro
Before adopting the euro, Member States are required to demonstrate sustainable fulfillment of all convergence criteria, for example the requirements regarding inflation, budgetary discipline, interest and exchange rates. Compliance with the exchange rate criterion requires adherence to the normal bands of the European Monetary System's exchange rate mechanism without serious strains and without lowering the central rate for at least two years prior to the convergence assessment. Convergence assessments are subject to the principle of equal treatment (between the current and future euro area countries and among the future Member States themselves).

Challenges for Monetary Integration
The new Member States still have to complete their transformation processes and are thus in the midst of a long-term catching-up process. The challenge is twofold: On the one hand, it will be necessary to maintain the adaptability of the exchange rate, and on the other, to avoid excessive appreciation and exchange rate fluctuations which cannot be justified in real economic terms. The appropriate time of entry into ERM II is to be assessed individually in the light of each Member State's overall economic situation. The time of entry is likely to vary considerably from country to country. The general idea is to proceed with caution.

Effects of EU Enlargement on Austria

Given the relatively low economic weight of the new Member States, the enlargement is expected to have, on balance, positive (albeit slight) effects on economic growth in the EU in the medium term. In the course of the continued transition and convergence process, however, this economic area will gain considerable importance.

Owing to its geographical location, Austria will derive more growth impetus from the enlargement than other EU regions. As the new Member States already account for 12.6% of Austria's overall exports, Austria has the strongest ties of all Member States to this region. As far-reaching trade agreements have gradually liberalized trade between the EU and the accession countries, the majority of trade effects have already taken hold. With the exception of a few specific areas (e.g. agricultural goods), trade relations have already been intensified on the back of liberalization efforts. Therefore, additional positive trade effects generated by the enlargement of the EU will remain relatively slight for Austria. In contrast, efficiency gains induced by competition following the enlargement, also known as Single Market effects, can be expected to stimulate growth to a greater extent.

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[1] *A currency board arrangement is a currency regime in which the exchange rate is pegged to a reference currency (or anchor) and the monetary base must be covered completely by gold and foreign currency reserves at all times.*

Chart 2

Share of the Eight Central and Eastern European Member States in EU-15 Foreign Trade (2002)

%

12 — AT (~12)
10
8 — DE (~8.5)
6 — FI (~6)
4 — SE (~4.5), DK (~4.2), IT (~4.1)
2 — FR (~2.4), NL (~2.3), ES (~2.2), GB (~2.1), BE (~2.1), LU (~2.0), GR (~2.0), PT (~1.6)
0 — IE (~0.8)

AT   DE   FI   SE   DK   IT   FR   NL   ES   GB   BE   LU   GR   PT   IE
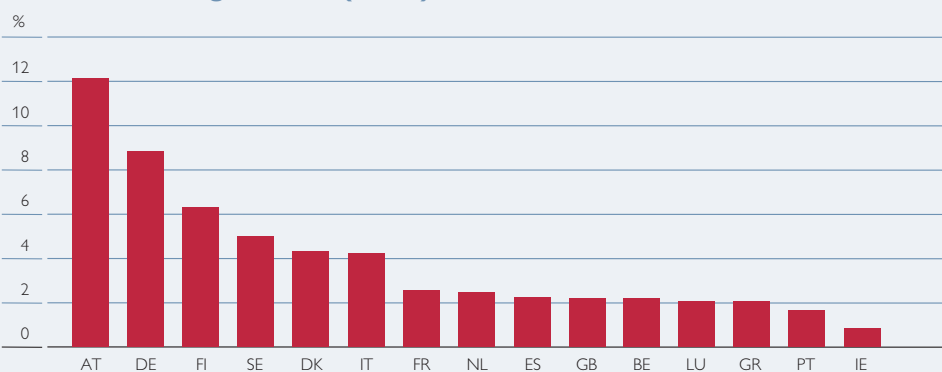
Source: UN, Direction of Trade.

Central and Eastern Europe is an important destination for Austrian companies not only in terms of exports but also in terms of foreign direct investment. This manifests itself largely in banking, where Austria holds a market share of approximately one fifth in the new Central and Eastern European Member States (measured in terms of total assets). The EU enlargement will further reduce the risk faced by Austrian banks in these countries and serve to enhance growth opportunities.

Table 2

Change in Real GDP Following the EU Enlargement

	Trade effects	Single Market effects	FDI in new Member States	Migration into the EU	Budget effects	Overall effects
	% (cumulative)					
Austria	0.14	0.64	−0.20	0.16	0.01	0.66
EU-13[1]	0.05	0.33	−0.16	0.06	−0.03	0.26
Poland	2.47	2.07	0.45	−0.12	3.15	8.02
Hungary	4.20	1.25	0.81	−0.09	2.23	8.40
Czech Republic	2.84	0.54	0.37	−0.08	1.98	5.65

Source: Breuss, F.: Macroeconomic Effects of EU Enlargement for Old and New Members, WIFO Working Papers, No. 143, March 2001.
[1] Not including Luxembourg and Greece.

As regards the Austrian labor market, crowding-out effects can be expected in certain segments, which may lead to a slight increase in unemployment. However, the agreed seven-year transition periods with regard to the free movement of persons and services, as well as demographic developments in Austria and the economic transition process in the new Member States, will reduce the pressure on the Austrian labor market considerably. In addition, immigration should also result in positive effects on economic growth.

2 Worldwide Economic Recovery Accelerates

2.1 U.S. Projects Strong Economic Growth in 2004

In the international arena, the process of economic recovery appears to be taking hold. This acceleration of growth is especially visible in the U.S., where increases in consumer spending and a revival of private in-vestment have created a strong impe-tus for growth. Consumer spending has been fueled by tax cuts as well as low interest rates, with private house-holds increasingly refinancing their mortgage loans. Economic growth in the U.S. accelerated to 8.2% in the third quarter and to 4.1% in the fourth quarter of 2003 (annualized in relation to the previous quarter),

thus amounting to 3.1% overall in the year 2003. The Federal Reserve Bank's expansive monetary policy and a significantly higher level of industrial confidence have led to a turnaround in corporate investment. In particular, investments in plants and equipment have demonstrated a pronounced upward trend. Due to very high (and partly cyclical) productivity growth, which averaged approximately 4.4% in the year 2003, the recovery has not yet boosted U.S. employment figures.

The immediate economic outlook for the U.S. is positive. The strong growth in private investment is likely to continue, and companies will probably not reduce their already low inventories any further, which means that industrial production should increase further. Consumer spending is expected to contribute further to economic growth if the waning tax effects are replaced by an increase in employment and higher aggregate real incomes. According to the latest consensus forecasts, this could lead to real GDP growth of approximately 4.6% in 2004, which would then gradually move back toward the trend by dropping to 3.7% in 2005.

The Federal Reserve Bank's monetary policy has been very expansive for some time now and is based on the low core inflation rate, which is just above 1%. However, the CPI inflation rate has remained just above that level, mainly because of considerable increases in energy prices. Nevertheless, the Federal Open Market Committee (FOMC) recently stated that tightening the U.S.'s accommodating monetary policy could be postponed in the light of the still-low level of capacity utilization and high productivity growth rates. In the financial markets, this has been interpreted as a signal that an increase in the federal funds rate (currently 1%) need not be expected until the second half of 2004 at the earliest – and possibly not until 2005.

However, the positive growth outlook in the U.S. contrasts with risks in the medium and long term. The U.S. current account deficit, already substantial in the 1990s, has increased even further in recent years (2003: 5% of GDP). The budget deficit has also surged due to massive tax cuts. Under these circumstances, it seems questionable whether foreign investors will still be willing to invest in the U.S. without demanding a risk premium in return. This would at least slow economic recovery in the U.S. amid worsening financing conditions. Another risk is that of stagnating employment (jobless growth) despite accelerated GDP growth. As long as companies continue to meet rising demand by increasing efficiency, thus not improving the employment situation, we cannot expect to see further increases in consumer spending.

2.2 Asia Driving Growth

The economic recovery has also continued in Asia. Even Japan seems to have left its years of recession behind, with GDP growing by 1.6% in the fourth quarter of 2003 (compared with the previous quarter). This accelerated growth can be attributed largely to domestic demand and to investment in particular. However, the contribution of net exports also increased in the fourth quarter of 2003 despite the strengthening of the yen in the previous months. Japan's exports mainly went to the expanding economies of East Asia: China and other countries in the region, such as Thailand, Singapore and Malaysia are currently profiting from rising

demand in the U.S. In parallel, the increased consumer confidence in these countries should also lead to healthy growth in domestic demand.

2.3 Growth Accelerating in the EU's New Member States

After two fairly weak years, real GDP growth in the new EU Member States rose to an average of 3.6% in 2003, with – compared with 2002 – decidedly higher growth rates in Poland (3.6%) and the Czech Republic (2.9%), a fairly stable rate in Slovakia (4.2%), and slightly lower rates in Hungary (2.9%) and Slovenia (2.3%).

In Poland and Slovakia, vast improvements in net exports were key to accelerating (or maintaining high) growth rates. In Poland, decreasing unit labor costs and the continued slide of the zloty against the euro led to very rapid growth in exports, thus ending the decline in gross fixed capital formation which had persisted for several years. In Slovakia, the sudden jump in exports can be attributed to extensive foreign direct investment. The increase in exports was more than able to offset the sharp decrease in consumer spending and public consumption. The slump in consumer spending was mainly attributable to the drastic hike in consumer prices, with regulated prices rising particularly sharply in the run-up to liberalization.

In the Czech Republic and Slovenia, on the other hand, sharp decreases in inflation bolstered consumer spending, and low real interest rates buoyed gross fixed capital formation. While the increase in imports to the Czech republic was offset by stronger export growth due to declining unit labor costs, the slowdown in export growth was so significant in Slovenia that GDP growth fell despite

a rise in domestic demand. Remarkably, this deterioration of real net exports did not manifest itself in Slovenia's balance of payments.

In Hungary, the high level of consumer spending growth dropped only slightly, thus causing imports to spike sharply. However, a drastic slump in growth triggered by the deterioration of net exports was prevented by a marked increase in inventory building.

3 Euro Area: Moderate Recovery Continues

3.1 GDP Growth Increases in Fourth Quarter of 2003

Real GDP growth in the euro area for the fourth quarter of 2003 indicates that economic recovery is moderate but ongoing in this region. In the fourth quarter of 2003, real GDP grew by 0.3% compared with the previous quarter. Year on year, real GDP growth rose by 0.6%. While GDP growth was still mainly driven by the contribution of net exports in the third quarter of 2003, fourth-quarter GDP gained impetus from investments. Given the rise in investment, this quarter saw domestic demand reach its highest growth rate since late 1999.

The fourth quarter of 2003 also brought the first positive signals in fixed investments in a long time: These investments rose by 0.6% quarter on quarter, thus showing their highest growth rate since early 1998. Prior to that, periods of declining or stagnating fixed investments, prevailed mainly due to severe uncertainties in the corporate sector. Interest rates in the euro area, which have been very low on the long-term average, may also have contributed to the increase in investments. Various confidence indices reflected the increase in industrial confidence. For example,

Chart 3

Contribution of Real GDP Components to Growth in the Euro Area

percentage points

Gross fixed capital formation
Consumer spending (households)
Gross domestic product
Contribution of net exports (goods and services)
Public consumption

Source: Eurostat.
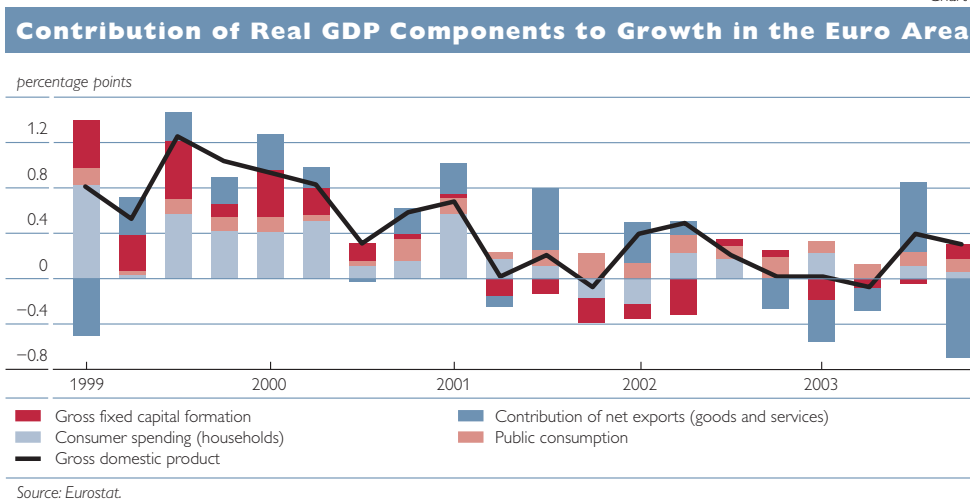
the Purchasing Managers' Index for the euro area as well as the European Commission's industrial confidence index and the ifo's Business Climate Index increased sharply in the second half of 2003. The latter two indicators more or less stagnated in the first quarter of 2004.

Household expenditure is still lackluster. Since the first quarter of 2001 increases in consumer spending have remained at a very low level (fourth quarter of 2003: 0.0% quarter on quarter). This slump in demand, which also showed itself in the downward trend in retail growth rates in 2003, can be linked to both slow growth in disposable income and the still-low level of consumer confidence. This is made clear in the Euro-

Chart 4

Business Climate Indicators

deviation from mean indicator value relative to standard deviation

Euro area (industrial confidence index, European Commission)
Euro area (Purchasing Managers' Survey, Reuters/NTC)
ifo Business Climate Index (Germany)

Source: European Commissionn, ifo, NTC, OeNB.
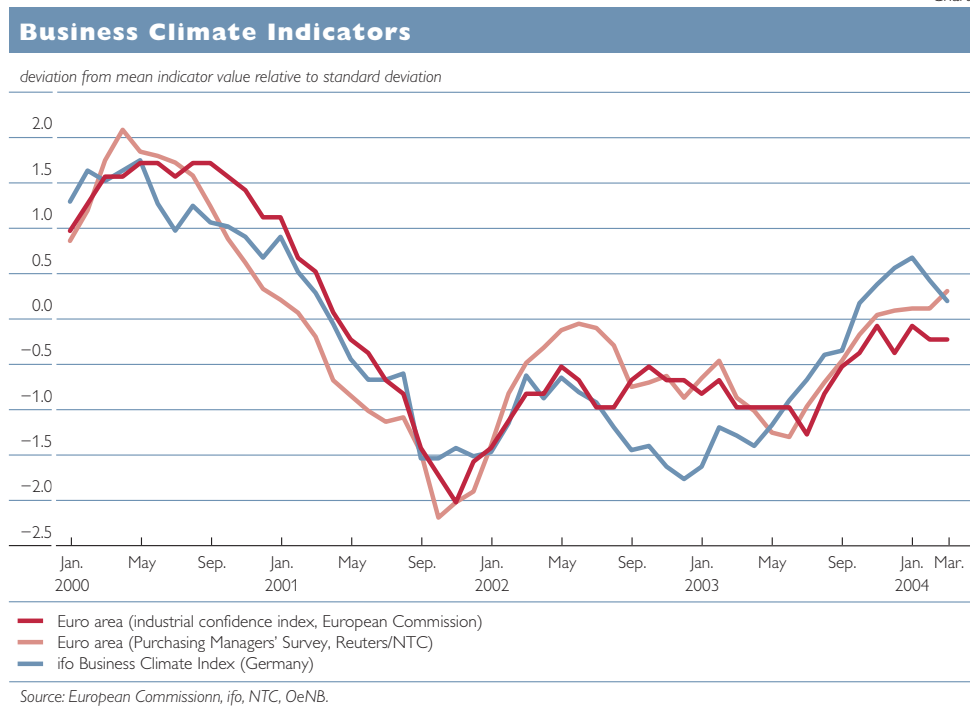
pean Commission's survey of consumer confidence, which is still very weak by historical comparison. Private households do assess the general state of the economy more positively, but they do not anticipate any improvements in their own financial situation. The reasons for this can be found in the persistently unfavorable situation in the labor market: Despite increased GDP growth, the unemployment rate has not gone down, and employment figures have remained stagnant in the last few quarters. Moreover, uncertainty about the future of social security systems in the areas of health care and pensions have also suppressed consumer demand.

The contribution of public consumption remained positive, edging up by 0.6% in the fourth quarter of 2003 (compared with the previous quarter). The contribution of net exports to growth shrank in the fourth quarter of 2003 against the previous quarter. Exports stagnated, changing at a rate of only 0.2%, while imports

increased by 2.1%. While export sales decreased in every month of 2003 except January, export volumes increased starting in May 2003. As the euro exchange rate rose in the same period, this probably had unfavorable effects on the profit margins of exporters in the euro area.

3.2 Industrial Production Recovers, Unemployment Remains Stagnant

In February 2004, seasonally adjusted industrial production in the euro area rose by 0.6% year on year. This continued the recovery which began in mid-2003, although it was weaker than in the fourth quarter of 2003. This growth was brought about by an increase in intermediate and consumer goods manufacturing. In the fourth quarter of 2003, industrial production rose by 0.7% year on year. Industrial orders in the euro area declined by 3.2% in January 2004 compared with the previous month. Year on year the contraction amounted to 1.8%.

The seasonally adjusted rate of unemployment remained stable at 8.8%

Chart 5

Euro Exchange Rate Development

- Nominal effective exchange rate (index, left-hand scale)
- USD/EUR (right-hand scale)

Source: Eurostat, ECB.
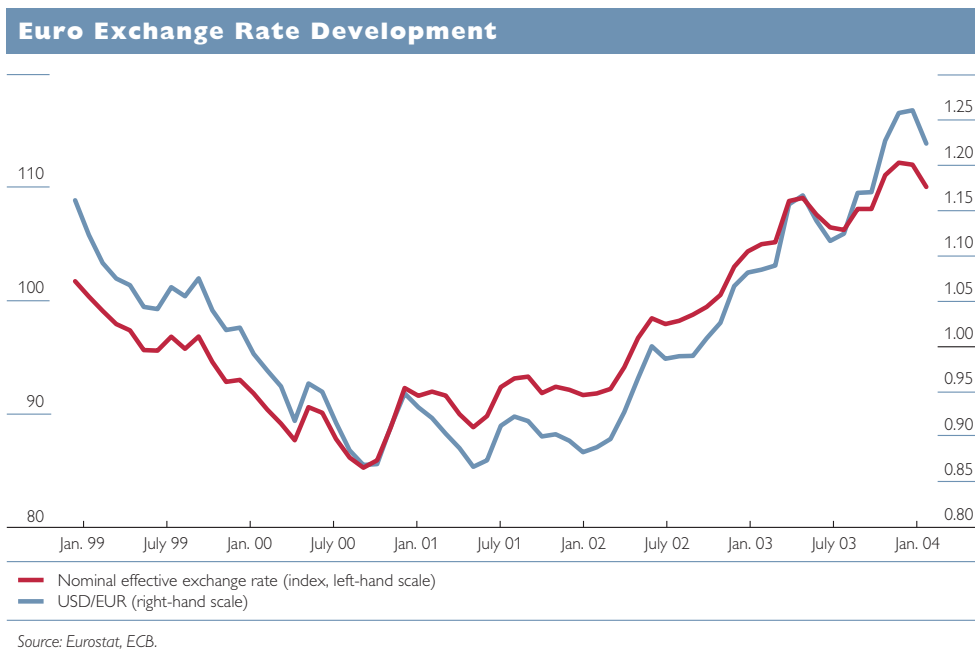
between March 2003 and February 2004. The strained situation in the labor market can also be seen in the ratio of job vacancies to the overall economically active population, which has been falling continuously since early 2001. Employment has largely remained stagnant since the second quarter of 2002. Once again, the expansion in service-sector employment was just able to offset job reductions in other areas in the fourth quarter of 2003. In total, employment only rose slightly (by 0.2%) in 2003, and this increase was carried exclusively by the service sector. Having stagnated for two quarters, labor productivity rose by 0.4% in the fourth quarter of 2003. The increase in GDP growth was thus generated by increases in productivity, not in employment.

3.3 Exchange Rate Shapes General Financial Climate

On February 17, 2004, the euro exchange rate reached a new high of USD 1.29. In the ensuing weeks, it dropped back down approximately 7% to 1.19 by mid-April. Although economic growth in the U.S. has increased far more sharply than in the euro area, market participants apparently do not expect the Fed to raise interest rates in the short term. The U.S.'s high current account deficit is probably also responsible for the U.S. dollar's current weakness. While the EUR/USD exchange rate had advanced by 10.1% in the previous 12 months, the increase in the nominal effective euro exchange rate in February 2004 was 7.9% year on year.

Long-term interest rates in the euro area dropped from 4.3% to 3.9% between early January and late March 2004. As at mid-April, they stood at 4.15% again. Therefore, market participants do not expect an interest rate hike in the coming months. However, the increase in the exchange rate is currently offsetting any inflationary effects or stronger impetus for GDP growth.

The rise in stock prices at euro area exchanges continued in the first month of 2004, but considerable market losses followed the terrorist attack in Madrid on March 11, 2004. By early April the prices had stabilized again.

3.4 Oil Price Eases HICP Inflation

After rising by 1.6% in February 2004, HICP inflation increased by 1.7% in March. This was attributable mainly to the dampening effect of the energy component: Year on year, energy prices fell considerably in the first quarter of 2004. The effect of the exchange rate also manifested itself in this context. Whereas the price of oil in the first quarter of 2004 was at approximately the same level in U.S. dollar as in the first quarter of 2003, it was considerably lower in euro. As the oil price dropped sharply in the second half of March 2003, the energy component will probably cause the inflation rate to climb in the coming months. In addition to this base effect, OPEC's agreement to reduce extraction quotas, which has already led to an increase in oil prices, could also result in higher inflation. The increase in the euro exchange rate is also having a moderating effect on inflation in other areas, as import prices are lower than they were in 2003 due to the euro's increased value.

3.5 Lending Still on the Rise in the Euro Area

The growth rate of loans to the private sector in the euro area was 5.5% in February 2004. Lending to the public sector showed dynamic development,

Chart 6

HICP Components: Contributions to Inflation

percentage points

Legend:
- Services
- Energy
- Non-energy industrial goods
- Food and beverages
- HICP total

Source: Eurostat.
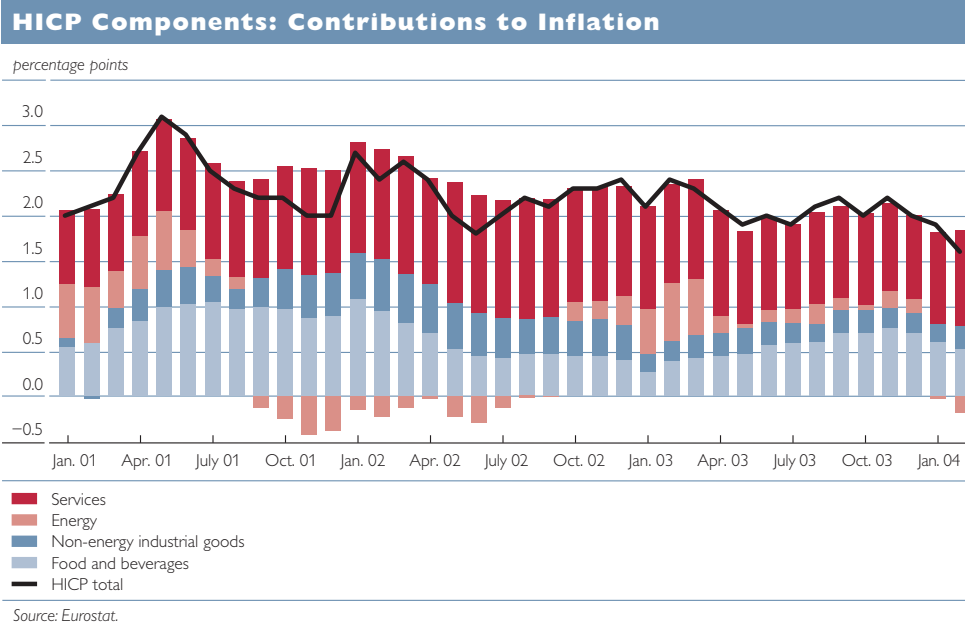
a fact which can be attributed to higher budget deficits. This continues the trend of a gradual increase in lending which has persisted since early 2003.

This credit growth is mainly due to an increase in the number of loans granted for housing purposes, while consumer loans and loans to nonfinancial corporations are still only growing slowly. The most likely reason for the expansion of housing loans is the currently low level of long-term interest rates.

M3 growth contracted further to 6.3% in February 2004 (January 2004: 6.5%), with growth slowing especially in miscellaneous short-term deposits and in marketable financial instruments. The unchanged high level of M1 growth can be ascribed to the low interest rates, among other things. The small spread between short-term and long-term interest rates is currently making investments in longer-term instruments less attractive.

3.6 Cautious Optimism for the Euro Area

The economic outlook for the euro area still points to gradual improvement. The European Commission's Economic Sentiment Indicator, having indicated an upward trend since mid-2003, stagnated in the first quarter of 2004. The European Commission forecasts quarterly growth rates between 0.3% and 0.7% for the euro area in the first two quarters of 2004. Vibrant growth of the euro area's trading partners should counteract the effects of the strong euro on net exports. Likewise, favorable financing conditions in the euro area should boost domestic demand — which has not lived up to expectations so far — throughout 2004.

The outlook for price stability is also positive. Current forecasts show an HICP inflation rate of less than 2% for the year 2004. In some countries, however, increases in indirect taxes will drive prices up in 2004. Due to the low level of industrial capacity utilization and the current out-

put gap, economic recovery will not necessarily lead to an immediate rise in inflation in the euro area.

4 Austria: A Cautious Upturn with Stable Prices

4.1 OeNB Economic Indicator: Moderate Recovery in the First Half of 2004

The OeNB economic indicator forecasts 0.4% seasonally adjusted growth in Austria's real GDP for the first and second quarter of 2004 (each compared with the previous quarter). Compared with the corresponding quarters in the previous year, this puts growth at 0.6% and 1.0%. The OeNB thus remains cautiously optimistic in its prognosis of economic developments in the first half of 2004, although hard facts which point to economic recovery are still missing. According to seasonally adjusted SNA figures, the Austrian economy stagnated almost completely in the second half of 2003. The seasonally adjusted real GDP growth rates in the third and fourth quarters of 2003 were each 0.1% compared with the previous quarter.

The current quarterly SNA data, however, are characterized by high uncertainty and should only be interpreted with caution. For example, a number of indicators point to a revival of economic activity already in the second half of 2003 and show that this recovery has continued into early 2004 – despite the moderating effects of the strong euro. These indicators include the latest external macroeconomic conditions, especially the revival of economic growth in the U.S. and the new Member States of the EU, the recovery of important financial market indicators, economic agents' increased confidence, highly favorable financing conditions, the low rate of inflation, and the economic support measures of the Austrian federal government.

4.2 Growth in 2003 above Euro Area Average but Near Stagnation in Second Half of Year

According to the available seasonally and workday adjusted quarterly data, Austrian economic growth (0.9%) is half a percentage point higher than that of the overall euro area in 2003. The dynamics throughout the year, however, depict a surprising development scenario. At the beginning of 2003, growth was generated by domestic demand, and especially investment activity boomed in the first quarter of 2003 (5.7% seasonally adjusted over the previous quarter). Investment growth was especially high in the categories of machines and equipment (+9.3%), but also all of the other
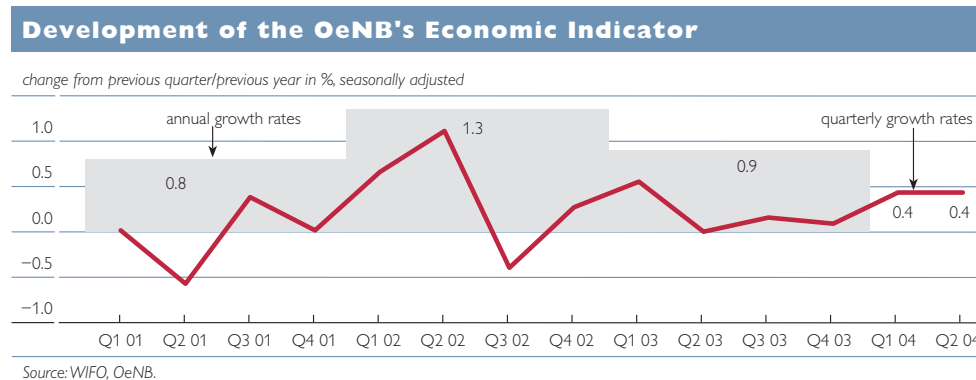
Chart 7

Development of the OeNB's Economic Indicator

change from previous quarter/previous year in %, seasonally adjusted

Source: WIFO, OeNB.

Table 3

Short-Term Real GDP Forecast for the First and Second Quarter of 2004

	2002				2003				2004	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
	%, seasonally adjusted									
Change from same quarter in previous year	0,5	2,0	1,3	1,5	1,4	0,4	0,9	0,8	0,6	1,0
Change from previous quarter	0,6	1,0	−0,4	0,3	0,5	0,0	0,1	0,1	0,4	0,4
Change from previous year	1,3 (1,4[1])				0,9 (0,7[1])				×	

Source: OeNB economic indicator values (April 2004), WIFO, Statistics Austria.
[1] *Value based on non-seasonally adjusted data.*

important investment components expanded at above-average rates in that quarter.

Against the trend in the euro area, consumer spending and investments in Austria dropped in the second half of 2003. Real GDP rose by 0.1% in the third as well as the fourth quarter, but only due to net exports. However, as the current seasonally adjusted SNA data are characterized by a high level of uncertainty, this picture could still change pronouncedly in future data revisions.

In the first half of 2004, exports will play an important role in Austria's economic upswing (in line with the ongoing international recovery) despite the strength of the euro. The highly favorable financing conditions and the strong need for replacement investments are having a reviving effect on corporate investment activity. In addition, the public sector is also pro-

viding impulses with the investment tax allawance and increased infrastructure spending. Overall, a palpable revival of investment activity is thus expected despite the still-low level of capacity utilization. Consumer spending, in contrast, will develop moderately in the short term. The retail sector, which was still developing relatively well in the first half of 2003, has been faced with declining revenues since mid-2003. Employment adjusted for persons on parental leave, in compulsory military service or undergoing training in an Austrian Public Employment Service Program stagnated in January and February 2004, and wage settlements remain moderate for the year 2004. In this situation, the low rates of inflation become even more important as they increase the purchasing power of households and make a substantial contribution to stabilizing consumer spending.

Table 4

Components of Real GDP in Austria (seasonally adjusted)

	2003	2003			
		Q1	Q2	Q3	Q4
	percentage	*change from previous period*			
Gross domestic produc	100,0	0,9 (0,7[2])	0,5	0,0	0,1
Domestic deman	97,5	2,0	1,3	0,3	0,1
Household expenditure and NPISH[1] expenditure	56,3	1,4	0,1	0,4	−0,3
Public consumption	18,2	0,7	0,0	0,1	0,1
Gross fixed capital formation	23,1	4,4	5,7	0,2	1,0
Exports	55,3	0,8	0,9	−2,1	2,1
Imports	53,2	2,5	3,1	−0,9	0,0

Source: Eurostat.
[1] *NPISH: non-profit organization servicing households.*
[2] *Value not seasonally and workday adjusted.*

4.3 Deterioration of Confidence Indicators not yet Interpreted as Sign of Sustained Trend Reversal

The increase in important international confidence indicators in the second half of 2003 reflects improvements in external macroeconomic conditions, which have made a substantial contribution to brightening Austria's economic outlook. Consequently, Austria's domestic indicators have also shown increased optimism in all areas of the economy. In recent months, however, these important national and international confidence indicators have not continued to increase; in fact, several have even declined. In particular, uncertainty about future economic developments has mounted again, while assessments of the current situation have stabilized. In Austrian industry, production expectations were again slightly more pessimistic in early 2004. Assesment of orders was also down slightly, with foreign orders being assessed with particular caution given the euro's rally. Confidence in the construction industry has stabilized at its 2003 level, thus remaining considerably higher than in 2001 und 2002. However, this indicator has not pointed to a further upward trend in the last 12 months. Confidence in the retail sector and among consumers has not increased any further due to the persistently unfavorable situation in the labor market. Overall, in March 2004 the European Commission's economic sentiment indicator for Austria (93.1 points) was 0.4 point below the average value for the fourth quarter of 2003, but still at the average value for the year 2003.

4.4 Positive Signals from the Financial Markets

In early 2004, Austria's financial markets showed positive developments. By mid-April 2004, the ATX was over 60% higher than in the previous year. While the lending volume in the second quarter of 2003 was lower year on year, lending growth accelerated continuously in the second half of 2003 and in early 2004. According to the latest bank lending survey, banks expected a slight increase in demand for loans on the part of businesses and households in the first quarter of 2004.

4.5 Labor Market Situation Remains Weak

Currently, a trend reversal in the Austrian labor market is not yet in sight. The year-on-year increase in employment has declined markedly in the last two months and was only 0.1% in March 2004 according to the Central Association of Austrian Social Insurance Institutions. Employment adjusted for persons on parental leave, in compulsory military training or registered in a training program of the Austrian Public Employment Service, dropped by almost 7,500 (–0.2%) in March 2004. As some participants in the Employment Service's training programs are now no longer counted as employed (as of January 2004), the figures mentioned above are subject to downward statistical distortion. The size of this effect is estimated at approximately 13,000 persons, that is, 0.4% of overall employment. Transposing this onto the data for March 2004 yields a relative change in active employment of just under +0.2%.

Given the labor supply increase, which is high for a period of moderate economic growth, employment growth is not sufficient to reduce unemployment. An initial positive signal has appeared in the number of job vacancies, which is a good leading indicator for the labor market. In Feb-

Chart 8

Financial Market Indicators

year-on-year change in % (left scale)

year-on-year change in % (right scale)

Left scale: 60, 50, 40, 30, 20, 10, 0, −10, −20

Right scale: 4.0, 3.0, 2.0, 1.0, 0.0, −1.0

X-axis: Jan. 02, May 02, Sep. 02, Jan. 03, May 03, Sep. 03, Jan. 04

— ATX (left-hand scale)
— Loans to domestic nonbanks (right-hand scale)

Source: Datastream, WIFO, OeNB.
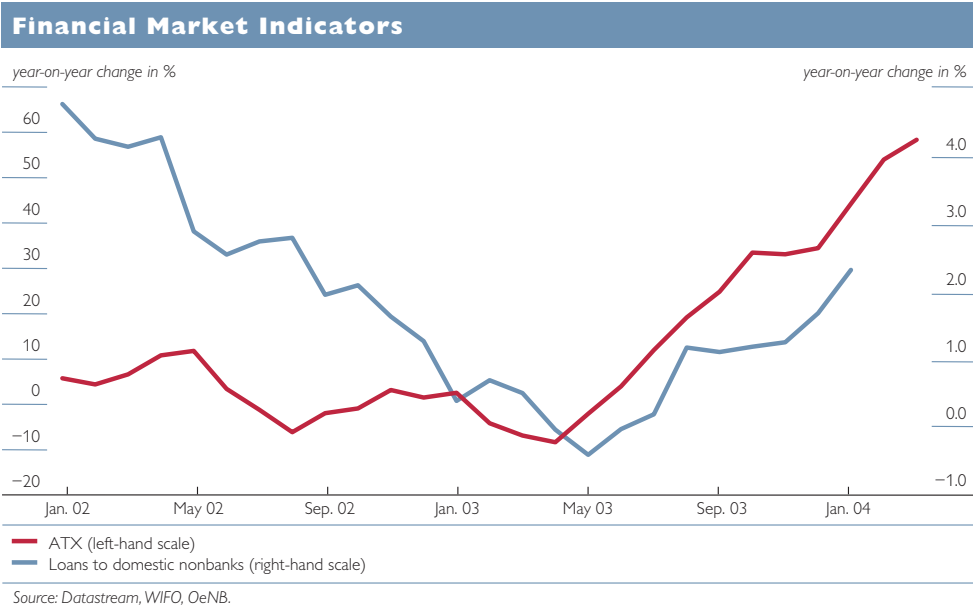
ruary 2004, the number of reported job vacancies increased year on year for the first time since late 2000. However, this development will have to solidify in the next few months before one can speak of an upcoming trend reversal. No relief in the labor market is expected in the coming months.
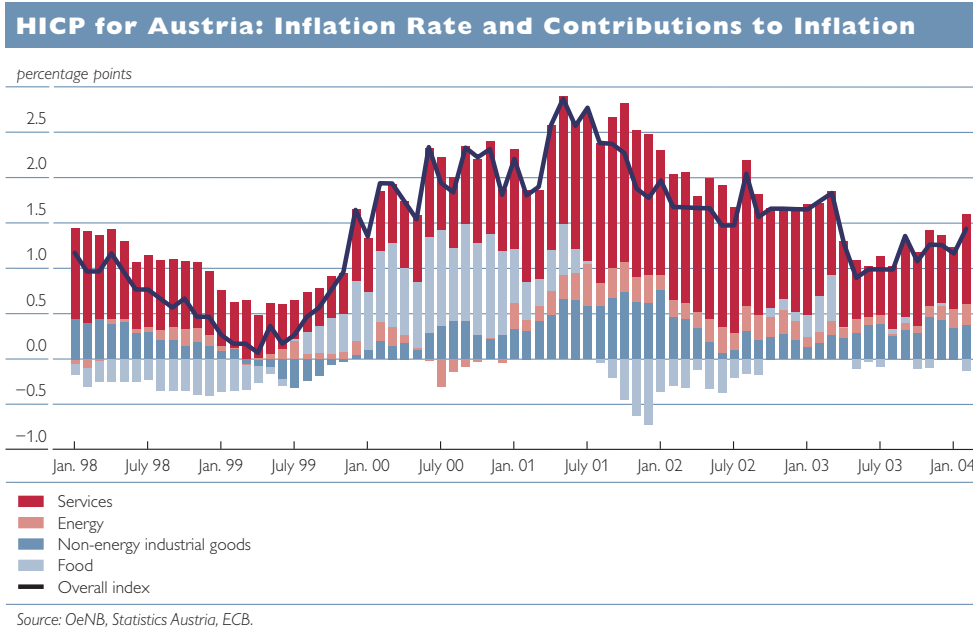
4.6 Inflation to Remain at Low Level

In the first half of 2003, inflation clearly slowed down. In mid-2003, inflation rates were as low as 1.0% according to the Harmonised Index of Consumer Prices (HICP). Only in the last four months of 2003 did inflation begin to rise slightly. In December 2003, the rate of inflation was 1.3%, precisely equal to that year's average, once again placing Austria among the euro area countries with the highest level of price stability. A look at the individual components yields a very uniform picture for the second half of 2003. The main factor responsible for inflation was the development of prices for food, alcoholic beverages and tobacco as well

as services. Below-average inflation rates were recorded in the areas of industrial goods and energy. Since the beginning of 2004, Austrian federal government measures, such as the energy tax increase and the introduction of truck tolls, have also caused additional price growth. The energy tax alone will contribute approximately 0.2 percentage point to the inflation rate in 2004. These effects were offset by countervailing base effects in the energy subcomponent at the beginning of the year.

4.7 2003 Current Account on Cash Basis almost Balanced

As expected in the OeNB's overall economic forecasts from spring 2003 and fall 2003, the current account deteriorated slightly in 2003 compared with the previous year. This can be attributed almost exclusively to the decreased surplus in the trade balance. As a result of the lively domestic economy in early 2003, demand for imports increased more sharply, while exports remained almost stagnant at the previous year's level due to the

Chart 9

HICP for Austria: Inflation Rate and Contributions to Inflation

percentage points

Services
Energy
Non-energy industrial goods
Food
Overall index

Source: OeNB, Statistics Austria, ECB.

rather poor external macroeconomic conditions and the strength of the euro. The subaccounts for services (with the important subcategory of tourism) as well as income and transfers changed only slightly from the previous year. On a cash basis, Austria's current account went from a surplus of EUR 0.81 billion in 2002 to a deficit of EUR 0.97 billion (0.4% of GDP) in 2003.

This deterioration of the trade balance is also reflected in the preliminary foreign trade statistics compiled by Statistics Austria. The balance changed from a surplus of EUR 0.3 billion in 2002 to a deficit of EUR 1.4 billion in 2003. While trade in goods with other EU Member States continued to slacken, the surplus against non-EU countries actually increased slightly. Simulations with the OeNB's macro model showed that the euro's rally in 2003 only worsened Austria's current account by EUR 0.31 billion. The negative effect of higher demand growth, in particular for investments in equipment with espe-

cially high imported content, was substantially larger.

4.8 Above-Average Uncertainty in Forecasting

Given a lack of hard facts indicating an upturn in the Austrian economy, and due to disappointing economic growth in the second half of 2003, the level of uncertainty in this short-term forecast is above average. The majority of risks appear to point downward. Any further strengthening of the euro would delay the recovery in the euro area and in Austria. Furthermore, due to the historically unique duration of this economic slump (three years), the ability of the econometric models underlying the indicator to produce meaningful statements could be limited. A further downward risk can be found in raw materials prices, which have risen sharply lately. Finally, the recovery of the equities markets in recent months could be interpreted as the correction of an excessive drop in prices after the end of the bull market.

Determinants of Long-Term Growth in Austria – A Call for a National Growth Strategy

This study, which offers a thorough analysis of growth in the past four decades, pinpoints total factor productivity (TFP) and human capital as the main engines of growth in Austria. In a further step it sheds light on the determining factors of TFP against the backdrop of a theoretical framework. The authors present evidence for the importance of innovative activity and human capital. They also examine the role of Austria's institutions involved in economic policy making as well as of economic rules and policies. Austria's dynamic external business is shown to foster productivity; EU enlargement could entail new agglomeration advantages. The study emphasizes the productivity-enhancing role of competition policy and market regulation. In their conclusions, the authors call for a long-term growth strategy for Austria and provide suggestions for such a strategy.

Ernest Gnan,
Jürgen Janger,
Johann Scharler

1 Introduction: Sustainable Growth – An Economic Policy Challenge

Delivering Lisbon – Implementation Stalls at the National Level

In hindsight, the post-war period of up to 1973 was a unique growth phase in Europe, underpinned by the speedy absorption of U.S. technology amid political and social stability (Crafts and Toniolo, 1995). In the 1980s and 1990s, growth slowed markedly in most European countries. Austria managed to delay the general slowdown in growth in the 1970s owing to its institutional framework and macroeconomic policy, but growth let up eventually. Even though it will be hardly possible in the future to attain growth rates similar to those prevailing in the 1950s and 1960s, some countries, e.g. Finland and Sweden, have succeeded in reversing the trend of declining rates.

The Lisbon European Council of March 2000 set the objective of transforming the European Union (EU) into the most competitive and dynamic knowledge-based economic area in the world by 2010. The underlying Lisbon strategy represents a comprehensive program of mostly structural policy measures that target a spectrum of issues.[1] To date, most euro area countries have made some progress in implementing this strategy; according to the European Commission (2004), it would, however, take a much faster pace of reform to meet the ambitious objectives set by the Lisbon Council.

In the face of slackening growth, a range of policy suggestions to stimulate growth were put forth also in Austria (see box Measures to Strengthen Long-Term Growth). Having defined growth as a key policy goal, the Austrian federal government has initiated a number of structural reforms. This study is meant to show that ultimately Austria, like the majority of euro area countries, needs a broadly based, long-term, *national growth strategy*.[2] Our starting point is that analyzing the determinants of growth in Austria by drawing on the more recent contributions in growth theory will help identify areas that require economic policy action.

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[1] Creation of an IT-based information society, establishment of a European Research and Innovation Area, stronger incentives for business creation, completion of the internal market, an efficient, fully integrated European financial market, sustainable budgets with growth-promoting revenue and expenditure structures, human capital formation, labor market reforms with a view to increasing labor supply and modernization of the welfare state.

[2] We thus basically agree with Pelkmans and Casey (2004), who, in evaluating the report by Sapir et al. (2003), had arrived at the conclusion that in Europe growth-enhancing structural policy measures have to be taken, above all, at the Member State level.

Chapter 2 presents a growth accounting exercise with Austrian data, ascertaining total factor productivity (TFP) and human capital as the main engines of growth over the past four decades. In a further step, we analyze the factors influencing TFP against a theoretical framework in chapter 3. The role of innovative activity, which is frequently limited to the narrower concept of technological progress in the literature, is the focus of chapter 4. Chapter 5 highlights the importance of human capital for productivity advances. Chapter 6 investigates the influence of incentive schemes and of the infrastructure generated by economic rules and eco-nomic policies. Section 6.1 explores the role of Austria's institutions involved in economic policy making and outlines potential needs for adjustments amid an ever-changing international environment. Section 6.2 demonstrates that Austria's vigorous external economic activity has had a favorable impact on productivity and that EU enlargement, improving Austria's position in economic geographic terms, should result in agglomeration advantages. Section 6.3 is dedicated to the productivity-enhancing role of competition policy and market regulation. Chapter 7 concludes and comprises suggestions for a long-term growth strategy for Austria.

Measures to Strengthen Long-Term Growth –

Expert Recommendations and Measures by the Austrian Federal Government

Expert recommendations

Most of the proposals put forth by national and international organizations[3] call for improving human capital formation by reforming training and continuing education programs. Furthermore, almost all of the studies reviewed here propose an increase in the research and development (R&D) to GDP ratio. To attain an R&D/GDP ratio of 2.5% or 3%, public expenditures must increase and Austria must be promoted as a research location, according to the Austrian Institute of Economic Research (WIFO). The studies moreover call for a new growth paradigm to speed up structural change based on the three pillars of innovation, regulation and accumulation.

The International Monetary Fund (IMF), the Institute for Advanced Studies (IHS) and the Austrian Federal Economic Chamber (WKO) urge the government to take immediate action to reform the labor market. Here, it is above all necessary to increase labor force participation by recruiting and retaining older employees. According to the Organisation for Economic Co-operation and Development (OECD), public sector employment rules need to be made more flexible. Besides, the IMF advises the government to review the child-care benefit scheme and to provide more funds for child-care facilities.

Especially the EU, the OECD and the IHS stress the need for intensified competition in Austria. For instance, product market rules, shop opening hours and the regulations governing trades and professions should be liberalized further. The low productivity growth in the service sector might be traceable to the lack of competition.

According to the Austrian Institute for Industrial Research (2003), Austria should seize the opportunities presented by EU enlargement and harness the potential of networks and clusters more vigorously. In addition, the Austrian Federal Economic Chamber (2002) calls for improving the infrastructure connecting Austria with its neighboring countries to the east.

[3] *See IMF (2003), OECD (2003), European Commission (2004); for the Austrian Institute of Economic Research (WIFO) Aiginger and Kramer (2003), Aiginger et al. (2003) as well as Peneder et al. (2001); for the Institute for Advanced Studies (IHS) Felderer et al. (2002); Austrian Federal Economic Chamber (2002) and Austrian Institute for Industrial Research (2003).*

Measures by the Austrian federal government

The Austrian federal government has initiated a number of structural policy measures, which may be summarized as follows:[4]

(1) *Boosting the employment ratio: By gradually increasing the legal retirement age, the government's pension reforms will lead to a lasting rise in older people's participation rate; in addition, an incentive scheme was put in place to encourage companies to employ older people. The introduction of the child-care benefit regime, however, seems to have dampened in particular women's participation rate.*

(2) *Fostering R&D and innovation: To anchor research promotion, the government established a National Foundation for Research, Technology and Development in 2003. It also raised both the research tax credit and the alternatively granted research subsidy.*

(3) *Promoting human capital formation: The government introduced a tax credit for continuing education with a view to offering companies an incentive to invest in staff training and development. The campaigns "unternehmen bildung" and "Bildungscluster" are aimed at intensifying cooperation between businesses and educational facilities.*

(4) *Intensifying competition: The liberalization of network industries has been largely concluded. The shop opening hours have been liberalized further. Setting up small businesses has become easier.*

(5) *Developing the infrastructure: Adjusting Austria's master transportation plan with a view to improving the infrastructure connecting Austria with the new EU Member States opens up a new agglomeration potential vis-à-vis Eastern Europe.*

Other steps the federal government has taken include measures to increase external economic integration, ensure overall economic stability (especially fiscal consolidation) and boost the number of startup businesses.

2 Total Factor Productivity and Human Capital – The Main Engines of Growth in Austria: Results of a Growth Accounting Exercise

Austria's Relative Prosperity against the Euro Area Average Has Remained Unchanged since 1990

From 1960 to 2002, yearly growth of real per capita income averaged 2.75% in Austria. Narrowing the averaging period to the two most recent decades starting in the early 1980s produces a lower average growth rate of 1.95%, however. As a result of the relatively high growth rates of the 1960s and 1970s Austria's per capita income converged quickly toward that of the U.S.A. Compared with its U.S. counterpart, Austria's per capita income had increased from 60% in 1960 to around 80% at the beginning of the 1980s, at which it has since then stabilized.

A comparison with the euro area yields a similar picture. From 1960 to 2002, average per capita growth in the euro area trailed Austria's growth slightly at 2.5%. Put differently, Austria's per capita income mounted from some 110% of the euro area average in 1960 to about 120% in 1990, at which it has remained more or less unchanged.

What are the main factors that have driven growth in Austria in the past and have these determinants changed over time? To explore these questions, we apply a simplified version of the growth accounting method proposed by Jones (2002). In this analysis, we break down real per capita income growth into the con-

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[4] *See Federal Government of Austria (2003), Federal Ministry for Economic Affairs and Labor (2001 to 2003).*

tributions to growth made by the individual factors of production.[5]

Physical Capital's Direct Contribution to Growth Is Relatively Small

Chart 1 summarizes the results of the growth accounting exercise. The rise in the capital-output ratio merely contributed some 0.11 percentage point to the growth of the Austrian per capita income from 1960 to 2002. Moreover, this positive contribution to growth stems from the years after 1981 since the contribution to growth of the capital-output ratio was –0.33 percentage point during the first half of the observation period. This puts physical capital among the lesser drivers of real income growth per capita in Austria, in particular from 1960 to 1981.

Growth Accounting

Growth accounting builds on the following macroeconomic production function:

$$Y_t = K_t^a (A_t H_t L_{Yt})^{1-\alpha}.$$

In this function, the overall output of period $t (Y_t)$ is generated by the factors capital (K_t), human capital (H_t) and labor (L_{Yt}), measured in hours worked. A_t is the total factor productivity (TFP), which may be interpreted as a measure of the human capital stock as well as of structural and institutional aspects which do not directly impact the use of the factors of production, but influence the overall output only indirectly, i.e. via the efficiency with which the factors can be utilized.[6] Parameter α equals the share of capital income in aggregate income.

The assumption is that the overall labor supply (L_t) may be used either in the output-producing sector or in the research sector. We therefore get $L_{Yt} = l_t L_t$, with L_t referring to labor supply measured in hours worked and l_t corresponding to the share in the labor supply that directly generates output. The remaining labor supply, i.e. $(1 - l_t)L_t$, is employed in the R&D sector, which raises TFP in the medium to long run. We do not, however, model the exact relationship between $(1 - l_t)L_t$, and A_t; moreover, A_t is calculated as a residual. After some rearrangement, we can decompose the growth rate of per capita income, g_y, as follows:

$$g_y = \frac{\alpha}{1-\alpha} g_{K/Y} + g_l + g_H + g_A + g_{L/N},$$

where N_t denotes the population and L_t/N_t represents the average hours worked per person. The per capita income growth rate thus equals the sum of the contributions to growth made by the capital-output ratio, the share of the labor supply employed in the output-producing sector and the human capital as well as TFP and the hours worked per person.

We use the following data sources in our growth accounting exercise: The data on real GDP, population, employment and average hours worked stem from the University of Groningen Total Economy Database and the annual macro-economic (AMECO) database of the European Commission. The capital coefficient is derived from the AMECO database. The stock of human capital is approximated based on the adult population's average years of schooling and is taken from de la Fuente and Doménech (2002). As this data set ends in 1990, the average growth rate of the average years of schooling from 1980 to 1990 is extrapolated for the period from 1990 to 2002.[7] The number of R&D employees was

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[5] *More recently, growth accounting analyses were applied, among others, by Prescott (2002), Jones (2002), Easterly and Levine (2001) as well as Hall and Jones (1999). Koman and Marin (1997) conducted a growth accounting exercise with Austrian data.*

[6] *The concept of technical progress (Hicks, 1932), which is frequently used in the growth literature, is closely linked to TFP (Solow, 1957). Technical progress denotes much more than just purely technical innovations, such as computers; it also refers to organizational change.*

[7] *To verify the robustness of the results, we repeated the calculation with human capital data from Barro and Lee (2001), as this data series is available until the year 2000. Since this calculation did not yield different qualitative results, we opted for extrapolating the data series compiled by de la Fuente and Doménech (2002), which had been processed more thoroughly.*

drawn from the OECD Research & Development (R&D) Database. Furthermore, we had to assume a value for parameter α, the share of capital income in aggregate income; according to Gollin (2002), we chose 0.3.

Chart 1

Contributions to Per Capita GDP Growth

percentage points

	1960–1980	1981–2002	1960–2002
GDP per Capita	3.74	1.95	2.75
TFP	4.78	1.01	2.37
Human capital	0.51	0.81	0.66
Hours worked per person	−1.21	−0.29	−0.38
Labor supply in the output-producing sector	−0.01	−0.01	−0.01
Capital-output ratio	−0.33	0.43	0.11

Source: OeNB.
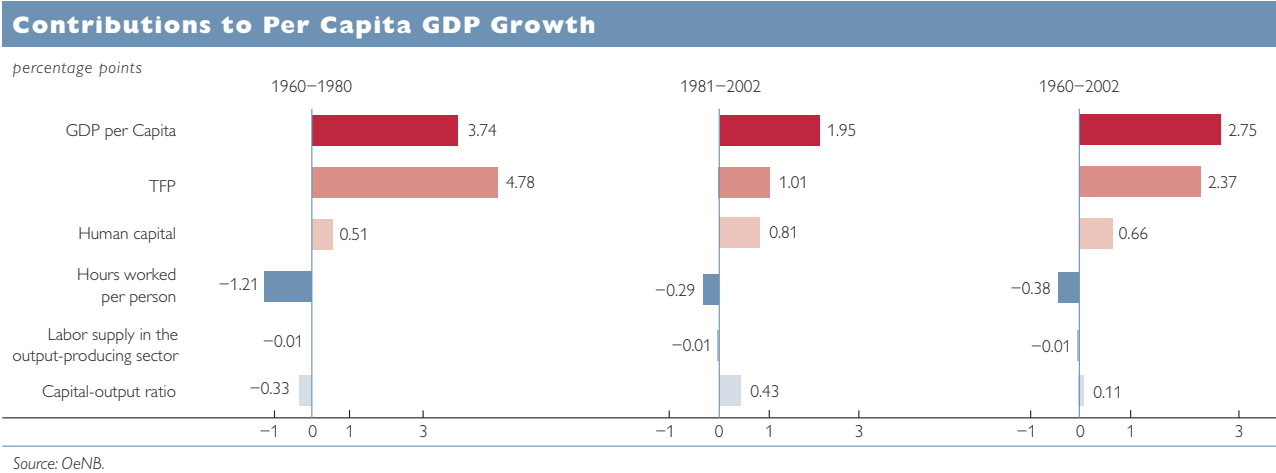
Decline in Hours Worked Dampens Per Capita Income

With the labor supply shifting from the output-producing to the R&D sector, the per capita income growth rate edged down by 0.01 percentage point in the three observation periods, i.e. the two subperiods and the entire period. However, the direct negative effect on overall economic output appears to have been more than compensated for indirectly as the increased utilization of labor and human capital in the R&D sector caused TFP to rise.

The decrease in the average hours worked per person led to a reduction in the per capita income growth rate by 0.38 percentage point from 1960 to 2002. From 1960 to 1980, this dampening effect was even more pronounced at −1.21 percentage points, contracting to −0.29 percentage point as from 1981.

Total Factor Productivity as Main Driver of Growth, Human Capital Gaining in Significance

As is evident from chart 1, per capita growth was basically driven by human capital and TFP and in the entire observation period, TFP accounted for 2.37 percentage points (86% of the per capita growth rate) . The contribution to per capita growth stemming from the rise in the human capital stock equaled 0.66 percentage point (24% of the per capita growth rate).

The relative contributions to growth of these two variables shifted markedly over time. From 1960 to 1980, TFP growth accounted for the single biggest contribution at 4.78 percentage points, followed by a wide margin by the increased human capital stock, whose share was, however, still remarkable at 0.51 percentage point. Things changed somewhat after 1981. Although TFP continued to account for the largest contribution to growth at 1.01 percentage points, its relative share contracted to just over 50%. At the same time, human capital gained in significance, with its contribution mounting to 0.81 percentage point (41% of per capita growth).

3 Sources of Productivity Gains in Austria – A Conceptual Framework

The growth accounting exercise in chapter 2 shows that growth in Austria over the past 40 years is predominantly attributable to the rise in TFP. In other words, the factors of production labor and capital are utilized much more efficiently today than in 1960. What factors fueled and tempered TFP growth? In chapters 4 to 6, we compare the relevant empirical findings of the more recent literature on growth with Austrian evidence to identify past and future determinants of TFP growth in Austria. We thus use the methodology proposed by Crafts (1996), who – given the lack of comprehensive internationally comparable TFP data for an empirical analysis of underlying growth factors – contrasted the new growth theory with economic history. This type of analysis promises particularly important insights for policymakers because Austria's TFP growth contracted further in recent years, i.e. from 1996 to 2000 (Nicoletti and Scarpetta, 2003), while a number of OECD countries have succeeded in reversing the TFP growth trend.[8]

Chart 2

Determining Factors of TFP Growth in Austria
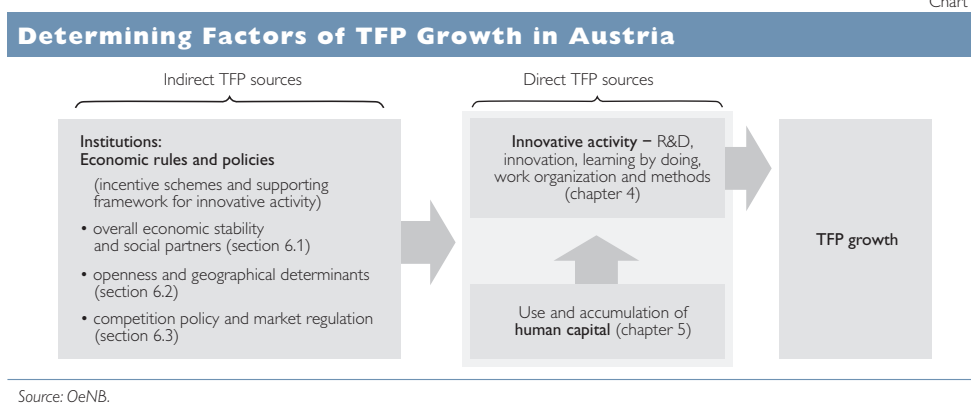
Source: OeNB.

Chart 2 illustrates the interplay of the factors influencing TFP. Innovative activity[9] is a direct source of TFP. It increases output by redeploying input factors (business and production process innovation) and spawns higher-quality, entirely new and more diverse products. Innovative activity depends on the availability of adequate human capital, though. National institutions and the economic rules and policies of a country impact on innovative activity via incentive schemes, the provision of the necessary infrastructure and framework conditions; they are therefore indirect determinants of TFP growth. Such indirect factors are (a) an economy's openness, including its geographical position and significance as a business location as well as the level of agglomeration, (b) institutions involved in economic policy making and (c) competition policy and market regulation.

The country-specific component is more pronounced in driving TFP

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[8]   Cases in point are Finland and Canada, but also the U.S.A., which accounts for the highest TFP level. The figures should be taken with a grain of salt, however, since, apart from computational difficulties, sustainable changes in trends may be determined only over a long period of time.

[9]   We define innovative activity as the causes of technological progress and, by extension, of total factor productivity and as ways leading to such progress.

growth than industry-specific productivity gains across national borders (Costello, 1993).[10] Thus, the country-specific interplay of factors determining TFP appears to be the reason why TFP growth differs from country to country.[11] Successful innovative activity in new industries may well rest on changed requirements for the available human capital and on new incentive schemes.

4 Innovative Activity Fuels Productivity Growth

Among innovative activities, the growth literature has singled out R&D efforts as well as the diffusion and efficient application of R&D results as particularly important contributors to growth. Apart from that, TFP growth is fueled by a variety of other activities, including innovations that reflect for instance the implications of learning by doing for the production process (Arrow, 1962) or incremental improvements made in response to customer feedback. Reorganizing production and work methods, as demonstrated by Adam Smith's pin-making example,[12] may likewise yield efficiency gains. To economize on space and given the high positive externalities of research and development, we will concentrate on R&D, the diffusion of R&D results and innovation especially in the manufacturing industry.

R&D Creates High Social Returns

While there is a wealth of microeconomic evidence showing that R&D has high private returns, the social return of R&D is much harder to pin down empirically, as R&D spillovers are difficult to measure. With the social returns of R&D characterized by nonrival consumption, they are, however, assumed to be higher than the benefits for individuals (Temple, 1999). Against this background, the private sector tends to invest less in R&D than is optimal for society as a whole. Ideally, industrial countries would spend more than four times as much on R&D as they currently do (see for instance estimates by Jones and Williams, 1998). Meister and Verspagen (2004) simulate the impact that raising European R&D expenditure to 3% of European GDP – i.e. reaching the target set by the Barcelona European Council – may have on the European productivity gap relative to the U.S.A. They show that achieving the Barcelona target alone will not suffice to close the gap between the EU and the U.S.A., to which the EU is committed under its Lisbon strategy. Despite the high significance of R&D for TFP growth, the measures inspired by the Lisbon strategy should therefore not only aim at raising R&D expenditures, but also at different growth drivers.

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[10] The extensive work by Porter (1990) and Lundvall (1992) corroborates the calculations with regard to the relevance of the national environment and the national innovation system for determining differences in overall economic output.

[11] Levine and Renelt (1992) propose to regard and analyze national (economic) policy as a complex set of measures.

[12] More recent examples include Fordism as well as the reorganization of production and the innovation of business processes through information and communications technologies.

Domestic R&D Raises the Capacity to Absorb Foreign Research Findings

Countries that are not productivity leaders may benefit more from adopting technologies developed abroad than from investing in R&D themselves. Temple's (1999) reading of the literature is that growth differentials are partly explained by the transfer of technologies. The estimates of Coe and Helpman (1995) indicate that foreign R&D is a powerful driver of domestic TFP growth. Eaton and Kortum (1996) find that even the U.S.A., the global leader in technology, derives half of its TFP growth from absorbing foreign research results.

Numerous growth models basically treat technology as a public good that is freely accessible throughout the world. Even if this were to be the case, a country's absorption capacity would still play a decisive role. Griffith et al. (2004) and Scharler et al. (2004) concur in finding that local R&D and local human resources are the key determinants of a country's absorptive capacity. The fact that local research acts as a catalyst for technology transfer implies that the economic effects of R&D for productivity growth have been underestimated in the existing literature. Human skills interact with R&D in the determination of a country's absorption capacity: Acemoglu and Zilibotti (2001) find a mismatch between the demands of foreign technology and the skills of the domestic workforce to account for national differences in TFP. Furthermore, the capacity of national innovation systems to spread knowledge (Lundvall, 1992), as reflected by the degree of interaction between producers and users of knowledge, influences the emergence and transfer of innovations. Finally, Scharler et al. (2004) find fairly unregulated labor and product markets to boost the capacity to absorb and implement foreign technologies.[13]

Austria's Mediocre R&D Ratio Reflects the Structure of Its Economy

The assessment of Austrian R&D and technology transfer activities is mixed. While the gap between Austria's R&D share of GDP (2003: 2.19%) and the OECD average almost closed in recent years, this ratio continues to appear too low for securing future productivity growth when compared with Austria's high GDP per capita. What is a cause for concern in this respect is that corporate expenditure with a direct bearing on innovation accounts for just a relatively small portion of total R&D spending (Hutschenreiter et al., 2003). This assessment is, however, put in perspective somewhat by the fact that Austrian companies score better when the broader concept of innovation is applied (Statistics Austria, 2003) and that the Austrian R&D deficiencies largely reflect the domestic industrial structure.

Different economic sectors have different research intensities depending on the nature of the underlying technologies (Breschi et al., 2000). In an international comparison, Austria has a high share of medium-technology industries. At the same time, the productivity performance of the Austrian industry is very good, a relationship that has been dubbed a "structure-performance paradox" (Peneder,

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[13] The findings of Keller (2002) moreover indicate that distance affects absorption capacity even in the age of globalization: While technological knowledge has become considerably more global over time, the benefits from technological spillovers continue to decline with distance.

2001). These findings are not new – WIFO reports identified structural deficiencies already in 1947/48 (Steger, 1985). Seidel (1985a and b) points out the discrepancy between robust macroeconomic performance and structural weaknesses of the Austrian economy. This discrepancy may, to some extent, reflect the heavy subsidization of basic industries in the post-war period. Austria's broad-based investment promotion policies, a key pillar of the Austrian economic policy framework, used to support above all capital-intensive industries.

High Productivity despite Low R&D Spending due to Incremental Innovation?

Moreover, empirical evidence on the Austrian production and innovation framework shows that manufacturing companies in particular are good at incremental innovation in market niches (see for instance Leitner, 2003, who describes the 50 most striking innovations made in Austria). This type of production has also become known as diversified quality production (DQP) (Streeck, 1991). In this case, innovation happens gradually in the production process through the input of highly qualified skilled workers, often in response to customer feedback. This contrasts with radical innovations often designed by highly funded in-house R&D facilities for the final consumer market, which are typical of U.S. companies. While the efforts going into incremental innovation do not necessarily show up as R&D expendi-

ture, their impact will be reflected in innovation surveys (Statistics Austria, 2003).

The papers compiled by Pichler (2003) underline the persistency of this pattern in Austria's industrial history and confirm the influence of path dependence and lock-in effects in the evolution of innovations – in Austria, knowledge has typically been accumulated in existing industries, whereas in general the emergence of radical innovations and of new industries is a comparatively seldom thing (Lundvall, 1992).

Judging from productivity growth rates in the manufacturing industry, we conclude that Austria's performance with regard to innovative activity has actually been better than the R&D ratio would suggest. Naturally, the question arises as to whether Austria's economic structure constitutes a risk factor for future productivity growth. Peneder et al. (2001) show that unless the pace of structural change accelerates, Austria may face growth setbacks in the long term.[14] With the catching-up process completed, the potential for rapidly adopting foreign technologies will be limited; as a result, growth will increasingly depend on outright innovation. Yet the innovation schemes described above imply that technology- and research-intensive industries are unlikely to mushroom; a gradual process of change is far more likely unless a sudden sales crisis emerges that would entail a massive shift in the sectoral structure. Future research into Austria's slowing

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[14] One reason why both technology-oriented and traditional industries have been performing well in terms of productivity is that the former have benefited from high demand as a result of product innovation while the latter have been good at developing innovative business processes (Akella et al., 2003). In the longer term, business process innovation may dry up as a source of productivity even for the traditional industries. Marin (1995) sees one explanation for the Austrian growth puzzle in the accumulation of experience – i.e. in the benefit of learning – in existing industries, while agents opening up new industries may initially incur productivity losses as they are just starting out on the learning curve.

growth momentum should focus more strongly on innovative activity in the service sector (Dachs and Leo, 1999) with a view to gaining more insights into the underlying causes of TFP growth.[15]

5 Human Capital as a Growth Factor

Human Capital Boosts Productivity

Human capital is the stock of knowledge and skill embodied in economically active individuals, which may be proxied statistically by the average years of schooling. As in the case of R&D, a wealth of microeconomic evidence attests that it pays to invest in education. De la Fuente and Doménech (2002) find evidence of a strong positive correlation between human capital and productivity also at the macroeconomic level. According to their estimates, raising the average period of schooling by one year will increase productivity by around 6% in the EU-15.

Yet human capital accumulation by itself is not a sufficient condition for growth; what is also important is that the skills of individuals match the structure of the economy. For instance, in developing countries, highly educated people have often found employment only in the public sector (Temple, 1999). Krueger and Kumar (2003a and b) identify the skill-specific orientation of the continental European schooling system as one possible reason for the divergent productivity growth paths of Europe and the U.S.A. European education policies favoring specialized vocational education might have worked well in the 1960s and 1970s. In the subsequent information age marked by rapid technological change, however, flexibility and adjustment have become a lot

more important. Against this background, the U.S. focus on tertiary education and skills transferable between firms prove to be more advantageous. Blanchard (2004) argues as well that European universities have a (crucial) need for reform.

Aging Labor Force May Dampen Productivity Growth

The aging of the population is also likely to have an impact on productivity growth. Prskawetz and Fent (2004) show in a number of scenarios that productivity projections are significantly influenced by underlying assumptions on the degree of possible substitution between employees of different ages. Lindh (2004) points out that higher investment in human capital but also a longer and more intensive utilization of the stock of human capital may help alleviate the growth problem triggered by population aging. In Austria, utilizing the human capital stock more intensively and efficiently meets with obstacles, though. One way to improve the compatibility of work and family commitments would be to provide sufficient child-care facilities. By contrast, the current child-care benefit regime creates disincentives for women to rejoin the labor force rapidly (OECD, 2003).

Austrian Education System in Need of Reform

According to the PISA survey (OECD, 2001), Austrian student performance in reading, mathematics and science at the secondary level of education is significantly above the OECD average. However, the good score comes at a relatively high financial cost (Mangold and Hennessy, 2003). At the tertiary level of education, the

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[15] *Productivity gains are low in the tourist industry, which is comparatively large in Austria (Smeral, 2003).*

low if increasing share of university graduates in general and the low share of science and technology graduates[16] in particular may be an obstacle to TFP growth. This may restrict the scope for structural change and innovative activity in existing companies, an effect that is further exacerbated by a brain drain. Austria's vocational concept of education used to be a recipe for success in the production type described above. However, a number of factors, including the acceleration of technological change and the rapid tertiarization of the economy call for a review of the education system to enable it to build capacity for innovative activity.

6 How Do Austrian Institutions Influence Productivity Growth?

Institutions Facilitate or Obstruct Innovative Activity

Hall and Jones (1999) find the productivity level of a country to be largely determined by its institutional setup and its economic policies. The economic institutions[17] of a country define the rules for economic action and provide incentives or disincentives for innovative activity. Together with the economic policy framework, they create basic incentives for using existing or developing new ideas and knowledge and for accumulating and efficiently applying human capital. Institutions are part of the social capital or the social capability to trigger growth processes (Johnson and Temple, 1998).

The institutional concept of the theory of national innovation systems (Lundvall, 1992) is a broad framework that determines human interaction, which is necessary for innovative activity. The significance the institutional setup of a country has for innovative activity results from the fundamental uncertainty that accompanies the process of change as well as from the complex communication between the agents of change. Institutions may promote or hinder innovative activity. On the one hand, they facilitate change by creating reliable framework conditions for innovative processes. Especially if the knowledge involved is only informal or exists only implicitly in the minds of the process agents, something new will be developed more easily when agents share the same language and the same social and cultural norms. On the other hand, institutions may lag behind technological progress because of their relative stability and inertia. This may cause the productive potential of a new technology to remain unexploited. Institutions may also prevent agents from "creatively forgetting" knowledge that has become obsolete, and they may be responsible for technological lock-in effects.

6.1 How Do Economic Stability and the Social Partners Influence Productivity Growth?

Economic Stability Boosts Growth; Investment Is a TFP Channel

The Austrian growth performance is widely believed to be basically the result of the high investment ratio, which had in turn been shored up by the stable political and economic framework and the hard currency policy (Zagler, 2000). The growth

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[16] When technical high school graduates are included, Austria is above the EU average, but still trails Finland and Sweden by a wide margin.

[17] According to North (1991, p. 97) institutions are the rules of the game of a society or the humanly devised constraints that structure political, economic and human interaction. They are composed of informal constraints (taboos, conventions, norms of behavior and rules of conduct) and formal rules (laws and regulations).

accounting exercise in chapter 2, by contrast, identifies TFP growth and human capital as the key determinants. While the accumulation of physical capital is a channel for TFP growth (Wolff, 1991),[18] TFP growth is also affected by a host of other factors.

The adequacy of the Austrian investment promotion regime may be called into question as, unlike labor productivity, capital productivity was low by international standards (Guger, 1998). Furthermore, the broad-based investment promotion measures used to favor capital-intensive industries, thus obstructing structural change. The recently expanded research tax credit regime and the newly introduced research subsidy scheme are likely to be more relevant for TFP than the (temporarily extended) investment allowance.

Macroeconomic stability in general is seen as a key driver of cross-country growth differentials (Temple, 1999). Ramey and Ramey (1995) show output volatility to have a negative effect on long-term growth. However, except for the mechanism described above (stability encourages investment, which may in turn promote TFP growth) no conclusive evidence has been established yet about the relationship that exists between macroeconomic stability and TFP growth, and about the role price stability plays in the process of TFP growth (Temple, 2000).

Positive and Negative Effects of the Social Partnership Regime on TFP Growth Are Increasingly Superseded by International Influences and Regulation

The social partnership system is likely to have affected TFP growth both positively (via three channels) and negatively (via one channel). First, the income policy pursued was conducive to Austria's hard currency policy, which pushed the open sector of the Austrian economy toward ever-higher productivity rates ("productivity whip"). This effect was relevant from the end of the 1970s until the introduction of the euro; yet even since 1995, when Austria joined the EU, it may have been superseded by the effects of stiffer competition, which stand to intensify even further in the future. Second, the social partnership process used to shore up political and social stability, including the stabilization of expectations,[19] through various channels (including income policy and the social partners' comprehensive integration[20] into economic and social policymaking), and thus contributed to reducing uncertainty and transaction costs (Butschek, 1995). In combination with the investment-friendly and growth-oriented policies of the Austrian trade unions,[21] this contributed to a high investment ratio. This effect weakened as the openness of the Austrian economy increased, as competences were trans-

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[18] Austria's high investment ratios largely reflect strong construction investment (Peneder et al., 2001), which tends to contribute little to TFP growth.

[19] Abramovitz (1981) believes that the scope for conflicts inherent in the growth process, because it undermines established vested interests, calls for a conflict-solving mechanism. He sees a certain rationale for social protection measures facilitating the social adaptation process that drives growth and technological progress, and thus ultimately TFP growth.

[20] Since the two major political parties agreed in principle on the economic framework of the mixed economy, businesses operated in a climate of stability in which they could make reliable planning decisions.

[21] See Olson (1971) for an explanation why comprehensive associations are able to internalize negative externalities of their activities. Dowrick and Spencer (1994) describe the theoretical mechanism that coordinated trade unions – as exist in Austria – are more innovation-friendly than uncoordinated trade unions – as exist in the United Kingdom.

ferred to the EU and as international political instabilities rose. Wage policy will nonetheless continue to be an important stability factor in the euro area. Third, the social partners are a key pillar of the apprenticeship system – which may be seen as a public good – and thus contribute fundamentally to human capital formation; after all it takes broad-based associations to organize an apprenticeship system and to prevent free-rider problems that would thwart the system.

At the same time, a certain resistance toward innovative activity may have been a drag on TFP growth. Landesmann (1992) finds that the social partners rarely advocated forward-looking economic policy and TFP-relevant measures, such as subsidizing R&D, reforming training and continuing education and generally promoting structural change. By contrast, they often sought to protect vested interests by forming coalitions with employers. By reinforcing a wide wage dispersion across industries, income policies have tended to obstruct structural change (Guger, 1998). Butschek (1985) identified the conservation of structures as the underlying weakness of the Austrian system, a criticism that he has since qualified in a more recent paper (1995).

Overall, the impact of the social partnership framework on TFP is likely to be increasingly superseded by international influences and regulation (the internal market of the EU, WTO-led deregulation, EU enlargement), while its conflict-solving potential and thus stabilizing role are here to stay.

6.2 Openness and EU Enlargement Favor Productivity Growth in Austria

Austria's Openness Facilitates Competition and Technology Transfer

The openness of an economy (measured basically by trade and FDI flows) affects TFP growth above all through two channels: An open economy may absorb foreign technologies (with imported goods often driving international spillovers) and ideas. Moreover, openness adds to the intensity of domestic competition, which, in turn, creates incentives for change and fuels productivity growth.[22] Utilizing possibilities for specialization and realizing economies of scale are other channels through which TFP growth may be fueled. Alcalá and Ciccone (2004) provide empirical evidence for a positive influence of real openness (imports and exports at market prices as a share of GDP at purchasing power parities) on TFP growth, and for a positive correlation between population growth and productivity. Frankel and Romer (1999) likewise show international trade to affect growth through the TFP channel. Coe and Helpman (1995) find the positive effects of foreign R&D on domestic TFP to be the higher the more open the domestic economy (in terms of trade flows) is. In addition, they show that in Austria TFP growth responds particularly positively to German R&D.

In the post-war period, Austria's ties with the Western hemisphere and accession to EFTA produced significant productivity impulses. At the same time, growth was adversely affected by Austria's not joining the EU right away in the 1960s (Fischer, 1985). Accession to the EU in 1995

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[22] For an empirical confirmation in the form of a sectoral study, see Galdón-Sánchez and Schmitz (2002) as well as Nicoletti and Scarpetta (2003).

constituted an important regime change; the productivity gains recorded for the manufacturing industry since 1995 have been above average. EU enlargement and the ongoing liberalization of world trade should boost TFP growth further. Since the small size of the Austrian market and of its population work to its disadvantage, the openness of the economy will continue to be an important factor also in the future, even though national borders constitute a major obstacle for economic exchange despite the prevailing free-trade regime (Helliwell, 1998). While Austria is a comparatively open economy even now, there is room for further opening-up – currently Austria ranks 7th among the top 20 in the broad globalization index (A. T. Kearney and Foreign Policy, 2004) but is outperformed by other small European economies when it comes to export and import ratios.

EU Enlargement Enhances Austria's Geographical Conditions for Productivity Growth

EU enlargement does not contribute to TFP through competition and technology spillovers alone; it may also contribute by changing the geographical determinants of productivity such as location and the degree of agglomeration. In conurbations, corporate productivity is boosted above all by local technological spillovers (Glaeser et al., 1992). Yet even without such spillovers, market mechanisms in small and large agglomerations (e.g. the "blue banana," or central axis of the EU, which stretches from London to Milan) may create a dynamic virtuous circle between agglomeration and endogenous growth (Martin and Ottaviano, 2001). Higher productivity levels have been confirmed empirically for cities and larger agglomerations (for the U.S.A., see Ciccone and Hall, 1996). In Europe, the influence of the national productivity regimes naturally prevails, but Geppert et al. (2003) find production levels to be significantly higher around larger agglomerations in Europe as well.

The opening up of Eastern Europe has propelled Austria from the rim to the center of the European economy. Given the dynamics of the axis Prague-Vienna-Bratislava-Budapest, the "blue banana" may henceforth stretch further east. With the increasing catching-up and opening-up of Southeastern Europe, yet another economic area will gain momentum and thus create a positive climate for productivity growth in Austria.[23] This presupposes adequate transport and communications infrastructures, which also contribute to productivity growth (the exact impact of this effect is, however, controversial; see Gramlich, 1994). Agglomeration advantages may thus be realized as trade costs go down. In other words, Austrian TFP growth would benefit from infrastructure development.

6.3 Competition and Intelligent Regulation Foster Productivity Growth

Product Market Deregulation May Fuel TFP Growth

Several studies provide strong evidence that product market regulation correlates with productivity growth in a number of ways. By simulating the effects of cutting the euro area's product market regulation[24] to the

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[23] Peneder et al. (2001, p. 145) hence argue that it would be a pity if the chance of EU enlargement were passed up amid unfounded fears that vicinity may constitute a threat rather than a chance.

[24] In the three areas of privatization, market entry barriers and industry-specific regulation.

level of the three euro area countries with the lowest degree of regulation, Nicoletti and Scarpetta (2003) deduce a significant potential for TFP growth. Alesina et al. (2003) find market entry barriers in particular to adversely affect investment activity. Van Ark et al. (2003) show that the bulk of the EU's productivity gap vis-à-vis the U.S.A. reflects productivity differences in retail and wholesale trade as well as in the financial services industry. Foster et al. (2002) empirically trace virtually all of the U.S. retail sector's productivity gains to new, productive companies entering and existing companies leaving the market. McGuckin and Van Ark (2001) consider certain product and labor market rules to prevent European companies from fully exploiting the advantages of new information and communications technologies.[25] Detailed empirical studies at the industry level appear to confirm these effects (McKinsey Global Institute, 2002 and 2003). Often, these effects will not be limited to pure deregulation measures, but perhaps even more so depend on an intelligent (re)regulation of markets – as a case in point, the European mobile phone market has benefited from the introduction of the GSM standard.

In Austria, competition in product markets used to be limited on account of numerous regulatory schemes – partly initiated by the social partners – under which especially new competitors found it hard to enter the market and declining industries benefited from an excess of protection

(Guger, 1998). Following EU accession, numerous industries have been opened up, and many companies have been privatized in this process. A development that stands out in this respect was the liberalization of the network industries, which has been largely completed. For these sectors, dedicated regulatory authorities (e.g. Telekom Control) have been put in place, and entry barriers have been generally lowered by the fact that it has been made easier to establish a company and that the regulations governing trades and professions have been liberalized. However, the intensity of competition has been criticized as inadequate, above all with regard to the service sector (OECD, 2003). Entry barriers and industry-specific regulations, e.g. for professions, continue to exist. An area that benefits from particularly high, EU-wide protection is agriculture. While the Austrian competition policy was recently subjected to a sweeping reform, there have been calls for increasing the capacity of the newly established competition authority (OECD, 2003) and for simplifying the competition framework and for remedying its shortcomings (Böheim, 2003).

The Austrian Labor Market is Fairly Flexible

No conclusive evidence has so far been produced on the productivity effects of labor market regulation; at an aggregate level, relationships may be masked by industry-specific success factors,[26] for instance when labor market regulation is shown to foster

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[25] *See findings presented in Scharler et al. (2004).*

[26] *Some industries rely on both firm-specific and industry-specific skills that employees will be able to acquire thanks to adequate support by labor market regulation. Other industries, by contrast, rely on external labor markets on which they may quickly recruit skilled labor (see Hall and Soskice, 2001, for a description of this mechanism).*

human capital formation in some industries. Scharler et al. (2004) show that labor market and product market regulation adversely affect the capacity to absorb new technologies, but distinguishing the individual effects is difficult. Compared with Germany (even after the implementation of the Hartz reforms), Austrian labor regulations are fairly flexible. In Austria, the type and degree of product market regulation may thus in fact be a bigger issue for future growth than labor market regulation.

Impact of the Financial Regime on TFP is as yet Unclear

Financial systems facilitate innovation through a number of mechanisms (King and Levine, 1993). Whether a market-based regime or a bank-based regime is better at facilitating innovation, is as yet unclear even though the market-based system has been conjectured to have advantages in times of rapid technological change (Ahn and Hemmings, 2000). The availability of venture capital financing for technology-oriented business upstarts also appears to constitute a TFP channel (Gompers and Lerner, 2001). The Austrian bank-based regime is well developed, and corporate bond markets have been benefiting from the greater liquidity of the euro markets. Yet as a ratio of domestic GDP, venture capital funding remains small by international standards. This is attributable to a weak capital market (i.e. low stock market liquidity) and to the structure of the Austrian economy (Peneder and Wieser, 2002).

Austrian Regulatory Framework Provides Incentives for Industries with Incremental Innovation

Soskice (1999) and Hall and Soskice (2001) present an overarching theory explaining the interaction between the TFP-relevant areas of market regulation and innovative activity. They claim that coordinated market economies, i.e. economic systems that are controlled – beyond market forces and government regulations – by business and labor associations; and liberal market economies, i.e. economic systems controlled by the market and the state alone, have developed coherent regulations that favor different industries. The regulatory framework of liberal market economies is supportive of radical innovation, while that of coordinated market economies encourages incremental innovation. By this definition, the Austrian economy provides incentives for industries with incremental innovation. Yet there is no empirical evidence of the influence on TFP growth in the aggregate economy.[27] Kitschelt (1991) puts forth the theory that certain technological cycles require certain institutions and that, as a result, different countries will be successful at different times.

7 Conclusions – A Call for a National Growth Strategy

The Austrian Incentive and Support Framework for Innovative Economic Activity Must Be Adapted to the New Conditions

Amid EU accession, the changeover to the euro, EU enlargement, globalization, population aging and with the evolution of the information age, the

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[27] Evidently, such forces would work only if industries with incremental innovation included first and foremost medium-technology segments. Such evidence has not been produced to date.

political, economic and technological framework conditions for Austria have changed tremendously in recent decades. Against this background, the question arises as to whether the existing domestic economic institutions still offer adequate incentives and adequate support for innovative activity. In other words, is the Austrian growth mix, i.e. the interaction of TFP factors, still adequate? The domestic slowdown in TFP growth, which has been rebounding in various other countries, is a cause for concern, even more so as, despite all globalization effects, TFP growth continues to be largely determined by the national productivity regime. While smaller countries may have an initial disadvantage when it comes to TFP growth,[28] they also have a decisive advantage: As their preferences are more homogeneous, they find it easier to formulate and implement productivity-enhancing policy measures (Alesina, 2003). Nonetheless they need to work out a coherent strategy, given that the interrelation of the aspects involved is rather complex.[29]

Advantages of a Coordinated Medium-Term Growth Strategy

An Austrian growth strategy would have to reflect the outcome of an academic and political process in which all relevant organizations should be involved. The overall strategy should integrate reform proposals made for the various areas into a coherent package that takes adequate account of the interrelationship between the various elements. From an organizational point of view, it may be advisable to install a single "growth coordinator" (or "Lisbon coordinator"), who would be responsible for coordinating the design and implementation processes of all suggested growth policy measures. The growth strategy could define the common ground on which a new fundamental consensus can be forged across parties and social partners on measures to promote growth. Such a broad-based and detailed multiyear strategy would have a number of advantages:

– Decoupled from the political election cycle, reforms should thus be implemented more speedily. Regular progress evaluations might prevent reform deadlocks.
– Reforms are not seen as clientelism but as strategies to enhance common welfare. (This implies probably changes for everyone.)
– By giving the general public and companies a chance to prepare for change well in advance, the growth strategy contributes to stabilizing expectations and to maintaining social peace.
– Individual parties directly affected by the forthcoming changes as well as the national and international expert audiences have sufficient time to discuss optimal solutions.

Thus, the growth strategy would create possibilities for optimally supporting innovative activity that is necessary for long-term growth. This strategy could draw on the positive experiences gained with the Austrian hard currency policy and social partnership regime and provide for a growth mix adjusted to the new framework conditions. The chance for formulating such a strategy is there –

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[28] See Alcalá and Ciccone (2004), who find a positive correlation between productivity and population size.
[29] Peneder et al. (2001) call for a new growth paradigm – a coherent mix of measures – to accelerate structural change.

not only because Austria is a small, manageable country, but also because the social regulatory mechanisms that help balance interests are still in place.

Some Specific Suggestions

Below selected areas are pointed out in which a review of existing structures appears worthwhile. These measures support proposals raised earlier and presuppose a consistent focus of budget spending on TFP determinants, such as investment in human capital, R&D and infrastructure. They consist of direct (innovative activity and human capital) and indirect (agglomeration and competition) measures to boost TFP growth.

(1) *Create an R&D pull strategy and rely on first-rate universities to create momentum for local innovation*
Technology policymakers have already come up with numerous programs, studies and recommendations for action. In the future, it may be opportune to cease pursuing a push strategy and instead apply a strong pull strategy integrating all measures which aim at structural change with a view to boosting Austrian R&D activities.[30] In other words, established companies and industries should no longer be pushed to spend more on R&D activities; the focus should rather be on more research-intensive industries that will "automatically" pull up the R&D share. One of the pillars of this strategy would be first-rate universities, a natural breeding ground for local innovation and structural change. Naturally, for

universities to play such a role, it takes incentives and structures that will offer students (of science and technology) superior training, facilitate the transfer of academic knowledge to productive application in the economy, and encourage the mobility of researchers between universities and industry as well as the establishment of spin-offs.

(2) *Adapt the human capital strategy to the requirements of the information age and an aging population*
There are signs that the current focus of the education system is misaligned with the economic structure or the requirements for innovative activity. The nature of innovative activities in the service sector and the faster pace of technological change (in the manufacturing industry) call for training the ability to respond flexibly to change and the capacity to rapidly acquire new skills. Unless countermeasures are taken, the scarcity of students and researchers in science and technology disciplines will considerably impede the innovative efforts of businesses. Furthermore, the brain drain of Austrian researchers, particularly to the U.S.A., is linked with the way universities are organized.[31] Population aging requires well-designed systems of lifelong learning that facilitate necessary career changes at an advanced age, for instance on account of physical disabilities. It takes a more efficient and a more intensive utilization of human capital to cope with a

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[30] See Peneder et al. (2001) for a detailed discussion of structural change and related measures.

[31] The University Organization Act of 2002 failed to exploit the advantages of the U.S. tenure track system; see Scheibelhofer (2003) and Pechar (2004). For more suggestions (especially with regard to education and professional development), see Aiginger et al. (2003).

shrinking and aging labor force and ensuing productivity effects – one way may be to offer more child-care facilities to help employees to better balance work and family commitments.

(3) *Improve infrastructures to exploit agglomeration advantages created by EU enlargement*

An improved transport infrastructure would allow for a more effective exploitation of agglomeration advantages that EU enlargement may create. According to the current master transportation plan (Federal Ministry of Transport, Innovation and Technology, 2002) infrastructure expansions are to be oriented on the expected demand for transportation. Given the economic geography mechanisms described above, infrastructure expansions should also reflect the anticipated impact of transportation supply on demand – not because they would raise transportation flows but because they would promote endogenous growth in agglomerations by reducing transaction and innovation costs. Policymakers should consider implementing the master transportation plan more speedily and in a forward-looking manner by putting the priority on improving the links to Austria's eastern neighbors.

(4) *Speed up the deregulation of product markets and services*

Given the low intensity of competition in the service sector, there is scope for increasing incentives to adopt new technologies (OECD, 2003). Competition-enhancing measures that Austria may take include speeding up the process of adopting the EU directive on services in the internal market and EU trade liberalization measures at the EU level, as well as removing market entry barriers and industry-specific regulatory policies at the national level.

(5) *The complex interaction of individual areas requires an integrated perspective and evidence-based policies*

Potential interdependencies between individual areas (such as financial, product and labor markets; see Hall and Soskice, 2001) call for caution about unanticipated consequences. With Austrian regulation giving industries with incremental innovation an edge in international competition, a fundamental policy change may put existing industries at a disadvantage before industries benefiting from the new approach may evolve. In establishing a growth strategy, it would therefore be imperative to first analyze its repercussions in detail (scenarios and simulations in order to set up policies based on evidence).

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Inflation Differentials in Europe: Past Experience and Future Prospects

This paper analyzes past and potential inflation differentials for current EU Member States and the acceding countries. Although inflation differentials decreased significantly over the last ten years or so within the EU-15/EU-12 and the acceding countries, they are still on top of the policy agenda. Indeed there are a number of potential causes of inflation differentials. They range from cyclical factors via the exchange rate pass-through and oil price shocks to differences in productivity advances and changes in indirect taxes. Regarding the impact of these factors on inflation, a number of similarities can be found across countries. At the same time, because differences exist, e.g. in the cyclical position, the degree of openness, oil intensity or dependency as well as price and productivity levels, inflation differentials are not likely to vanish completely in the future. We also argue that the often cited catching-up factors, such as the Balassa-Samuelson effect, seem to be considerably weaker than generally believed. In addition, inflation differentials could be clearly associated with inappropriate national fiscal and structural policies.

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1 Introduction

In April 2003, a Big Mac at McDonald's cost, according to *The Economist's* Bic Mac index, in the euro area EUR 3.24, and the corresponding price in Denmark was EUR 4.47. At the same time, one had to pay only about half when buying the same very standardized product in Slovakia, Hungary, Poland, Estonia, Lithuania or the Czech Republic.[2] This phenomenon reflects not only the substantial undervaluation of the acceding countries' currencies in terms of purchasing power parity but also roughly illustrates differences in price levels and in relative prices.

In general, different price levels may result in differing inflation rates. This phenomenon can be observed not only across countries but also across regions, cities or even city districts. The reasons for inflation differentials can indeed be manifold: They may be the outcome of different cycles, noncompetitive market structures, structural rigidities, different consumer preferences or cost structures and depend on the location (e.g. transportation costs, local taxes). They can be supply or demand driven.

In the long run, however, there are several mechanisms working into the opposite direction, helping reduce these differentials. In the European Union these are for instance the completion of the internal market, the reduction of subsidies, the dismantling of structural rigidities and, most recently, the introduction of the single currency.

In the European Union (EU), inflation differentials had not been a major issue for decades. They had more or less been taken for granted, given that the Community had always included both highly industrialized countries and catching-up countries. But the existing inflation differentials were not only the outcome of different levels of economic development; they also reflected different economic policies. In wage policies, one example was Italy with its *scala mobile,* which kept wage-price spirals going, instead of limiting wage increases to productivity gains. As to exchange rate regimes, there was the hard-currency bloc, which successfully maintained price stability most of the time, and, on the other hand, there were those countries which

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[2] Slovakia: EUR 1.92; Hungary: EUR 2.38; Poland: EUR 1.77; Estonia: EUR 2.26; Lithuania: EUR 2.25; Czech Republic: EUR 2.14. Source: www.economist.com/markets/Bigmac. The prices provided in USD are converted in euro using the EUR/USD exchange rate as of April 2003.

were aiming to gain competitiveness by depreciating their currencies and, as a result, were faced with two-digit inflation rates. Although this policy had adverse effects on the main trading partners, the resulting inflation differentials as such were not a major policy concern.

In the beginning of the 1990s, when the idea of a monetary union was taking shape, inflation differentials became a matter of widespread concern. How can this sudden interest be explained? In a monetary union there is only one interest rate, which is set on the basis of an area-wide assessment of economic conditions. If the level of inflation is found to deviate from the desired level in individual countries, it has to be dealt with using completely different instruments, for instance fiscal or structural policy measures, at the national level.

Whether or not a monetary union does become a success story depends on several conditions. On a general basis, the more member states trade with each other, the larger the gains are from eliminating nominal exchange rate fluctuations. Nevertheless, in the absence of synchronized business cycles among member states and because of asymmetric demand and supply shocks, the costs of irrevocably fixing the currency may exceed the gains stemming from an increased stability of the business environment. However, business cycles should get increasingly synchronized after the launch of the currency union if intra-industry trade is sufficiently high among member states and capital and labor factor mobility can help member states to adjust to asymmetric shocks. Hence, it appears that high intra-industry trade, efficient capital and flexible labor markets are key to a smoothly functioning monetary union.

In the run-up to Economic and Monetary Union (EMU), when inflation rates were squeezed, inflation differentials became smaller, too. The reason was a more stability-oriented overall macroeconomic policy, including, for instance, a restrictive fiscal policy to meet the fiscal convergence criteria, a productivity-oriented wage policy as well as participation in the exchange rate mechanism.

Recently several studies by international institutions (IMF, 2001 and 2002, OECD, 2002) expressed concern about widening inflation differentials in the years since the beginning of EMU. The present study in a first step reassesses the past evolution of inflation differentials in the euro area and investigates the possible underlying reasons. Several recent studies deal with the phenomenon of inflation differentials in highly industrialized countries (ECB, 2003), but they usually do not refer to EU enlargement. Since ten countries will join the EU in May 2004, it is, however, of major interest to assess future challenges and to broaden this investigation. The present study therefore incorporates the acceding countries into the analysis. The purpose is not to judge to what extent they already fulfill the Maastricht inflation criterion, given that the enlargement of monetary union is not just around the corner and there are a few other criteria to be met. Rather, a look at inflation differentials will be taken within a hypothetically enlarged euro area with respect to future policy challenges.

Inflation differentials are interesting from a general economic point of view because they are closely related to the evolution of the real exchange rate and thus to competitiveness and also relevant for capital movements. In particular, the acced-

ing countries may have deviating inflation rates when compared with current euro area countries, given differences in the Balassa-Samuelson effect and in the share of services and administered prices in the Consumer Price Index (CPI).

The remainder of the paper is as follows: Chapter 2 describes inflation differentials in the past by extending statistical measures to a hypothetically enlarged area of EU-15+10. Chapter 3 investigates underlying reasons for inflation differentials, such as cyclical and external factors, and factors related to the convergence of price levels. Finally, Chapter 4 concludes.

2 Inflation Differentials: Past Evidence

Recently there have been increasing concerns about worrisome inflation divergence in Europe. This section will first describe the inflation differentials in the current euro area. In a further step, however, a more forward-looking perspective is taken by also calculating inflation divergence measures for a hypothetically enlarged euro area. This will allow us a forward view on the upcoming policy challenges.

2.1 Inflation Differentials in the Euro Area

Chart 1 illustrates the change in inflation differentials in the euro area with several divergence indicators for the period 1990 to mid-2003. First, the spread is used, defined as the difference between the highest and the lowest national inflation rates. The spread (grey line, scale adjusted[3]) decreased dramatically from up to 20% at the beginning of the 1990s to around 1% in mid-1999, followed by a comparatively limited increase of inflation differentials in early 2000. Ever since then it has remained in a range of between 3% and 4%. As the spread is highly sensitive to single outliers and does not allow for a weighting of the observations, a high inflation rate in one small country can have a major impact on this dispersion measure.

The standard deviation is another measure of inflation differentials. The dark red line in chart 1 for the 12 euro area countries tells a similar story like the spread, although at a different level: according to this measure, dispersion decreased dramatically until mid-1999, increased thereafter and has remained stable at a level of slightly above 1% since mid-2000. A useful variant is the variation coefficient, defined as the ratio of the standard deviation to the mean of inflation. The superiority of this measure is based on the observation that inflation differentials tend to increase in times of high average inflation rates. An intuition is for example that the pass-through of an oil price increase will be most pronounced in countries that already show overheating tendencies. The standard deviation may therefore overestimate the inflation differentials.[4] The variation coefficient allows investigating inflation differentials independent of such scale effects. The smoother path of the dark blue line in chart 1 supports the assumption

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[3] *Divided by 3.*

[4] *The use of the variation coefficient entails a statistical problem in so far as it can take huge values whenever the average inflation rate (i.e. the denominator of the ratio) approaches zero. In the euro area, however, values close to zero were not observed for the inflation rate during the sample period so that this problem is not an issue here.*

Chart 1

HICP Dispersion Measures in the Euro Area (EU-12)

Spread (scale adjusted)
Standard deviation
Variation coefficient (right-hand scale)
Standard deviation (weighted)
Variation coefficient (weighted, right-hand scale)

Source: Eurostat, OeNB.
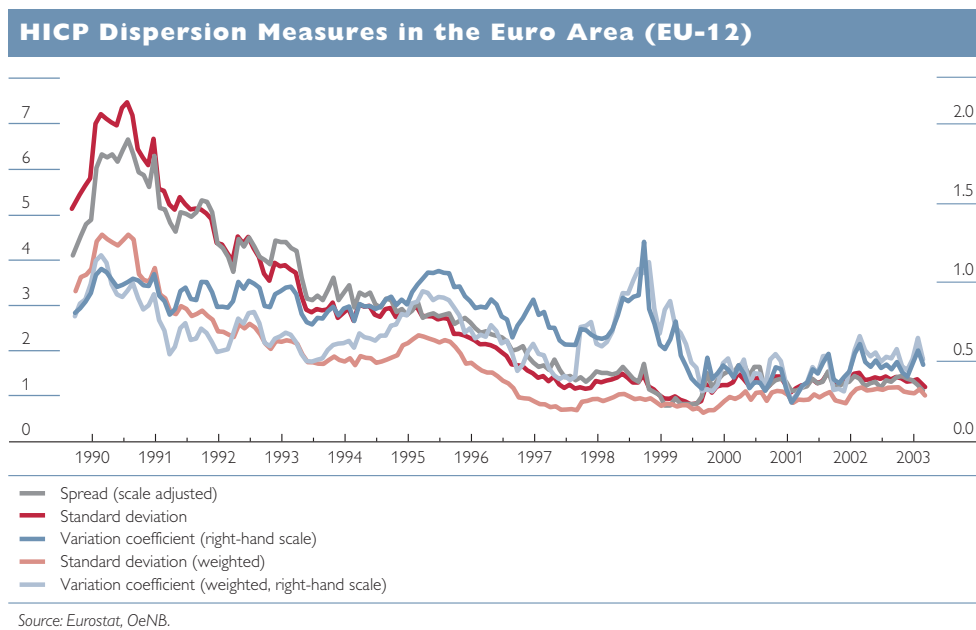
of a positive relationship between inflation dispersion and average inflation. The spike around January 1999 is attributable to a relatively high standard deviation while average inflation was relatively low. This measure of dispersion does therefore not report an increase in inflation dispersion during 1999. In the last year of our sample, however, there seems to be some level shift in the measure.

These unweighted measures are still very sensitive to divergent developments in small countries. An alternative is to use the weighted standard deviation and variation coefficient, which weights observations according to their nominal GDP. These dispersion measures better reflect the geographical dimensions and the potential impact on the euro area economy. In the case of the weighted standard deviation (light red line) the high inflation dispersion in the first half of the 1990s is far less pronounced, which reveals that relatively small countries play a big role in inflation dispersion. The increase in the standard deviation

at the end of 1999 is now far less pronounced and much flatter. The weighted variation coefficient (light blue line), the measure that takes into account different sizes of the economies as well as level shifts, again does not show any such increase but a slight level shift since mid-2002.

This analysis suggests that a huge part of inflation dispersion at the beginning of the 1990s can be traced to developments in relatively small countries. Their national inflation rates explain to a large extent the decreasing trend in the unweighted measures. This leads to the conclusion that dispersion measures that neglect country sizes may overestimate inflation differentials. The other finding is that the slight increase in inflation dispersion at the end of 1999 can be attributed to higher average inflation, reflecting sharp increases in oil prices. Taking into account this level effect, no evidence could be found for an increased inflation divergence at the end of the 1990s.

2.2 Inflation Differentials in a Hypothetically Enlarged Euro Area

In view of the forthcoming enlargement of the EU and the envisaged adoption of the euro in the acceding countries in the medium term, it is of interest to calculate a measure for inflation dispersion also for a hypothetically enlarged euro area. Chart 2 shows one of the most sensible divergence measures – the weighted standard deviation – for the EU-12 (the euro area countries), for the EU-15 (all current EU Member States) and for the EU-15+10 (i.e. in-

cluding the acceding countries, data available as of 1997).[5] This should in no way be seen as a claim that these countries are ready for euro area membership. Before adopting the euro, they will have to achieve a high degree of fiscal and monetary stability by fulfilling the Maastricht convergence criteria. One of these criteria calls for an inflation rate which is no more than 1.5 percentage points above that of the three best performing Member States. Only those countries that already show a sufficient degree of price stability will be allowed to adopt the euro.

Chart 2

Weighted Standard Deviation by Region: EU-12, EU-15 and EU-15+10

Source: Eurostat, OeNB.

The message that can be drawn from chart 2 is that the development of inflation differentials since mid 2001 within a hypothetically enlarged euro area does not differ substantially from the evolution of inflation differ-

entials in the 12 current euro area countries alone. EU inflation dispersion remained below the corresponding euro area measures for the major part of our data sample, however with a narrowing gap. The permanently

[5] To be precise the EU-15+10 measures were calculated with data of 24 countries only due to the lack of HICP data for Malta. Because of the small GDP weight of Malta this should not limit the information content of the measures.

lower GDP-weighted standard deviation for the EU-15 can be attributed to the fact that inflation rates in the three nonparticipating EU Member States did not show any extreme developments in the past. Since the end of the 1990s there has been no significant difference between the two measures.

For the EU-15+10 the dispersion measure was significantly higher between 1997 and 2001, when the acceding countries still experienced two-digit inflation rates. Since the beginning of data availability for the acceding countries in 1997, a huge disinflation process has taken place. The weighted standard deviation of inflation rates within all acceding countries taken together decreased from more than 5% in the first half of 1997 to around 2% since mid-2001. At the same time, the average inflation rate in the acceding countries dropped from more than 14% in January 1997 to less than 2% at the beginning of 2003. It is noteworthy that in mid-2003 the Czech Republic, Lithuania and Poland had lower inflation rates compared with the best performing EU Member States, such as Germany, the U.K. or Belgium. Although some of the acceding countries presently still show above-average inflation rates, the relatively small GDP weight of the upcoming EU Member States explains the small influence on the overall dispersion measure.[6]

To sum up, measures accounting for country weights apparently do not support the claim of some international institutions that euro area inflation differentials have pronouncedly increased since the beginning of monetary union. A look at measures for inflation differentials within a hypothetically enlarged euro area reveals a relatively minor impact on the inflation differential of the EU-15 in the recent past. During the past 15 months, inflation differentials as measured by the GDP-weighted standard deviation were very similar no matter whether they were based on EU-12, EU-15 or EU-15+10 data. In the case of the acceding countries this can also be attributed to their small GDP weights.

3 Inflation Differentials and Their Underlying Reasons

This chapter reviews the major theoretical arguments why inflation rates may deviate permanently or temporarily within a given group of countries. As the issue of inflation differentials is of major policy relevance only within a group of countries participating in a currency union, we will consider the current euro area as the benchmark for our analysis. We will give an overview of the various factors causing inflation differentials in the euro area and discuss their present and future relevance. In some selected cases we will also refer to the generalization of our results to the whole group of current EU countries.

While there are many studies about inflation differentials and their possible underlying reasons in the current EU Member States or the euro area countries, there are almost no such studies covering the acceding countries. Therefore we assess the role factors underlying inflation differentials play in the acceding countries compared to the current euro area and what relevance they will have in the future.

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[6]   In 2002 the nominal GDP of the acceding countries put together amounted to only 4.8% of euro area GDP
       and to 6.2% of EU GDP.

Section 3.1 assesses the cyclical dimension of inflation differentials. Unless business cycles are fully synchronized, differences in the cyclical position will translate into inflation dispersion. Section 3.2 examines the two main external factors that can lead to increased divergence in inflation developments: oil price shocks and exchange rate fluctuations. Section 3.3 finally considers factors related to price level convergence and to different developments of administered prices or taxes.

3.1 Cyclical Factors

The cyclical position of an economy is one major factor in inflation developments. This is illustrated in chart 3, which relates the most common meas-

ure for the cyclical position, the output gap (defined as the deviation of actual output from potential GDP as a percentage of potential GDP), to the EU inflation rate. The clearly visible co-movement confirms the close relationship of these measures.

For a panel of 11 EU countries (EU-12 without Luxembourg) this visual result is confirmed by regressing yearly national inflation rates (measured by the CPI) for the period 1971 to 2001 on the output gap. The first column in table 1 shows a positive and highly significant coefficient, indicating that output gaps play an important role in inflation developments in the euro area.[7] The same exercise carried out for the EU countries produce similar results.

Output-Gap and Inflation Rate in the EU

Source: OECD.
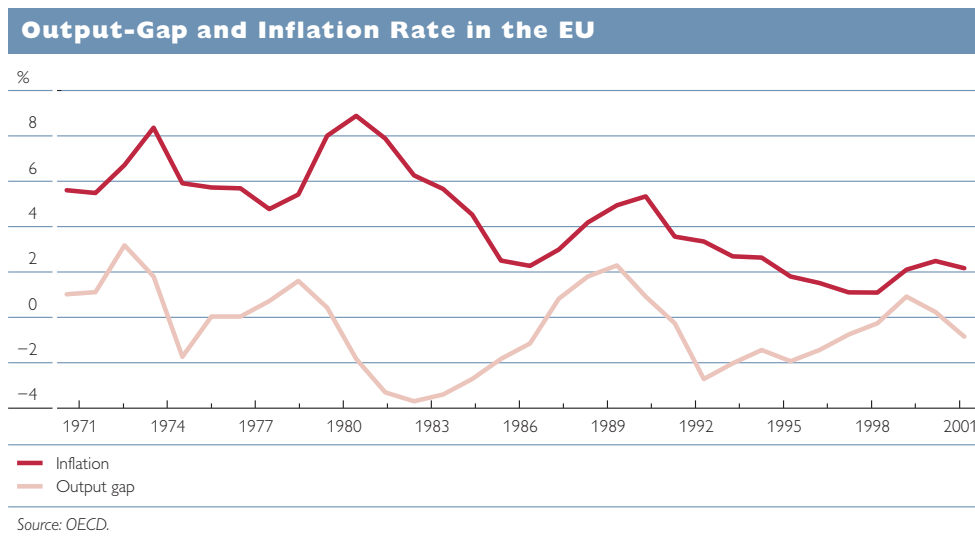
As long as business cycles within a group of countries are not perfectly synchronized, deviating cyclical movements will be a fundamental cause of inflation differentials. Within a monetary union monetary policy can no

longer be used as an instrument to stabilize national inflation rates; rather, adverse inflation developments have to be addressed by national economic and fiscal policies. Without any such actions, the move of a group of coun-

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[7]   The coefficient of the output gap is positive throughout the models presented in columns 1 to 4, it is however, not significant in the last model as long as we allow for fixed country effects. The reason is the relatively low variability of the output gap variable compared to the other variables in the model so that the fixed effect specification picks up most of its explanatory power.

Chart 4

Standard Deviation of Output Gap Estimates within the Euro Area Countries

Source: OECD, Economic Outlook.
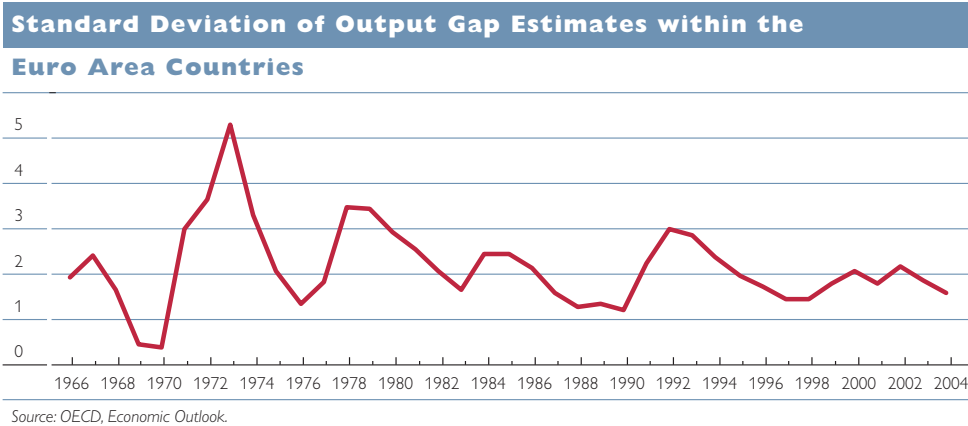
tries to a monetary union can in principle be assumed to lead to a higher degree of cyclically induced inflation differentials. The theory about the endogeneity of optimal currency area criteria, however, says that – provided intra-industry trade is high enough – business cycle synchronization increases for a group of countries participating in a monetary union so that the importance of cyclically caused inflation differentials should play a decreasing role.

Chart 4 shows the evolution of the standard deviation of annual output gaps for the 12 euro area countries. The fact that output gap dispersion has remained at a relatively moderate level since the run-up to the common currency could indicate such a narrowing of cyclical developments. If this observation continues, the role of inflation differentials should decrease. So far, however, a structural break in the series cannot be detected with econometric tools.

As regards the acceding countries, there seems to be an emerging view according to which business cycles are getting increasingly synchronized with those of the euro area. Although Babeckii et al. (2002), Fidrmuc and Korhonen (2003) and Korhonen

(2003) show the presence of asymmetric demand and supply-side shocks in some of the acceding countries, Frankel and Rose (1998) take the view that symmetric shocks are likely to dominate after the formation of an enlarged monetary union. Actually, Fidrmuc (2001) demonstrates that besides bilateral trade intensity the precondition of the endogenous convergence of business cycles is a high share of intra-industry trade in total trade. Hence, increasing business cycle synchronization can be explained by the fact that some acceding countries such as the Czech Republic and Hungary have high intra-industry trade vis-à-vis the euro area. In contrast, countries with lower intra-industry trade, such as Latvia, Lithuania and Poland, may experience less synchronization.

3.2 External Factors

The two most common external factors that can have a dramatic impact on inflation rates are changes in the exchange rate and oil price shocks. This section first provides evidence that these two factors matter for inflation and then discuss arguments why this effect may differ considerably across countries so that it can also explain part of inflation differentials.

3.2.1 Exchange Rate Pass-Through

An important external factor that affects inflation rates are changes in the nominal exchange rate. This can be referred to as the exchange rate pass-through. Indeed, changes in the nominal exchange rate first impact on import prices, and this effect subsequently feeds into prices of domestic tradable goods and finally into a broad set of price groups and into overall inflation. The extent of the pass-through depends on the share of imported final goods and the share of imported intermediate goods in domestically manufactured goods. But expectations are also bound to play an important role: changes in the exchange rate viewed as permanent are likely to have longer-lasting effects on prices in contrast to changes considered to be transitory. In addition to this, it has been shown recently that the larger the change and the lower the volatility of the nominal exchange rate, the higher the pass-through will be.

The second column in table 1 estimates the effect of a change in the nominal effective exchange rate (NEER henceforth) — a synthetic measure that weights the bilateral ex- change rates according to the trade weight of the respective country — on inflation rates in euro area countries. The negative and significant coefficient indicates that a nominal appreciation/depreciation of the NEER will have a negative/positive impact on inflation. The estimated coefficient below unity corroborates earlier studies (see Goldberg and Knetter, 1997, for a review of the literature). The main factor behind this incomplete pass-through is third degree price discrimination[8] in the markets, i.e. market segmentation. According to Darvas (2001), this is mainly due to transportation costs, tariff and non- tariff barriers, considerable differen- ces of even highly homogenous goods, home or brand loyalty, the presence of multinational firms and cross-border intra-firm trade.

Not only asymmetric exchange rate shocks but also those that occur simultaneously across countries could lead to changes in inflation differentials. Columns 3 and 4 in table 1 indicate that the openness of an economy, defined as the sum of exports and imports of goods divided by GDP, is an important factor determining the exchange rate shock pass-through. In

<div style="text-align:right">Table 1</div>

Determinants of Inflation Rates[1])

Variable	1	2	3	4
Output gap	0.136***	0.091*	0.102**	0.059
Change in exchange rate		−0.292***	−0.029	
Change in exchange rate × openness			−0.003***	−0.003***
Oil inflation		0.016***	−0.009	
Oil inflation × oil dependency			0.165***	0.118***
Oil inflation × oil intensity			0.003***	0.003***
Observations	359	326	285	285
R^2_{adj}	0.29	0.47	0.46	0.46

Source: Eurostat, OECD, IMF, IEA.

[1]) *Columns (1) and (2) based on all euro area countries except Luxembourg for the period 1971-2001. Columns (3) and (4) also without Greece. Fixed effects.*

Note: *** (**) [*] denotes significance at the 1% (5%) [10%] level.

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[8]   First degree price discrimination is when for every consumer the highest price he/she is willing to pay is charged. Second degree price discrimination refers to prices being determined in terms of sold units of the product. Under third degree price discrimination, different prices are charged for different segments of the market characterized by differences in e.g. geographical location, age and sex.

2002, openness ranged from less than 50% in Italy, Spain and France to more than 100% in Belgium and Ireland.

Provided that the European integration process leads to a further intensification of intra-EU trade and a decrease in market segmentation, the importance of exchange rate shocks on inflation rates and inflation differentials is expected to diminish. With regard to the acceding countries, the exchange rate pass-through should play an important role because most of them are very open economies, with openness ratios ranging from 74% in Latvia to about 130% in Estonia and Slovakia in 2002. Poland is a relatively closed economy with an openness ratio of roughly 50%. However, the empirical literature is rather mixed in this regard. Whereas Christoffersen et al. (2001) and Przystupa (2002) estimate the exchange rate pass-through to be strong in the acceding countries, Ganev et al. (2002) show that the link between changes in exchange rates and inflation rates was anything but stable in Hungary and Poland in the late 1990s. Results in Darvas (2001) suggest that in 2000 the degree of the pass-through from the exchange rate to overall inflation ranged from 15% to 40% in the Czech Republic, Hungary and Poland.

Given high overall openness, and since in all acceding countries, except for Lithuania, the share of trade with the EU in total trade was more than 50% — and as high as 65% in Hungary — in 2002, the adoption of the euro would in the future considerably dampen inflation differentials caused by exchange rate shocks between the acceding countries and the current euro area countries.

3.2.2 Oil Price Shocks

Oil price shocks have an impact on the inflation rate that materializes in several "waves." Oil prices have a direct first-round effect on the energy component of consumer price inflation. A way to evaluate the average delay of the effect of oil price developments on energy prices is to determine the lag length at which the correlation coefficients between the oil price and the energy price inflation series is highest. Following this approach we get an estimated lag of three months for the euro area. There is, however, evidence of the asymmetry of the lag length: While the pass-through of positive oil price shocks on energy prices takes place almost instantaneously (lag of one month), the estimated lag length is eight months in the case of decreasing oil prices. Transport costs will also almost immediately react to oil price changes. Examples of price groups that show indirect or delayed first-round effects of oil price shocks are producer prices (estimated lag length nine months) or prices for non-energy industrial goods (more than two years). As second-round effects we finally understand the delayed pass-through of oil price changes on consumer price inflation through the response of wages.

The second column in table 1 shows evidence of this positive and significant impact of oil price changes (in national currency) on inflation rates. It is noteworthy that the estimated coefficient is fairly low. This can be put down to the fact that taxes account on average for up to 70% of fuel prices in the euro area and thus play a buffer role in passing oil price changes onto consumer prices.

Having shown the importance of oil price developments for changes in inflation, we now turn to the — at

Chart 5

Oil Dependency (Net Oil Imports over GDP) and Oil Intensity of Production (Industrial Oil Consumption over Industrial Production)

Oil dependency
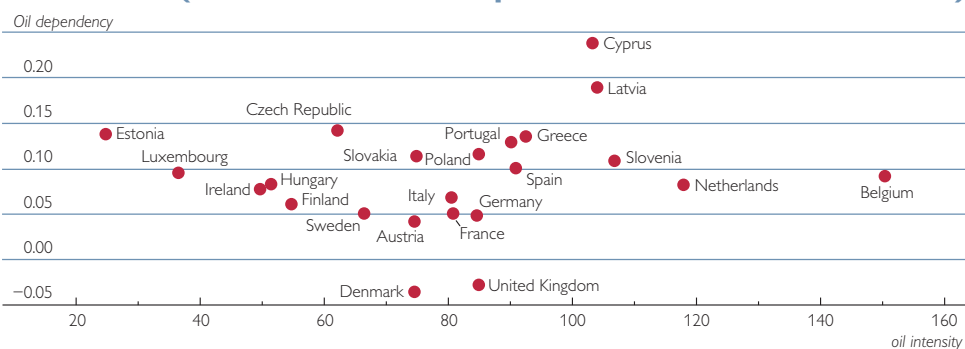
Source: OECD, Eurostat.

least – three ways in which oil price shocks can contribute to inflation differentials. First of all, oil price increases can be passed through onto consumers more easily under strong economic conditions. This implies that countries with higher positive output gaps may also experience a quicker oil price pass-through, so that inflation differentials may increase. The other two channels relate to a country's oil dependency ratio, defined as the ratio of net oil imports to GDP, and to the oil intensity of production, defined as industry oil consumption divided by industrial production. The more a country depends on external energy supply and the more energy intensive its production is, the higher the oil price effect on inflation will be. These effects are examined in columns 3 and 4 of table 1. The signs and significance levels of the coefficients indicate that the oil dependency ratio and the oil intensity of production are relevant factors explaining the speed of the oil price pass-through. In 2001 oil dependency ratios ranged from 3% in the United Kingdom and Denmark

to 13% in Greece, Portugal and Spain. Oil intensity ratios were lowest in Luxembourg (39%) and Finland (56%), countries with a highly service-based production structure, and highest in Belgium (148%) and the Netherlands (117%). The further to the right upper corner countries are in chart 5, the more their inflation rates depend on oil price changes.

Chart 5 illustrates the relevance of oil price developments for inflation rates in the acceding countries.[9] All the acceding countries are heavily dependent on oil imports compared with the EU average. The oil dependency ratio exceeds the respective numbers of EU countries in the case of Lithuania, Cyprus, Latvia, the Czech Republic and Estonia, while in the Slovak Republic, Poland, Slovenia and Hungary, it is comparable to that found in the EU catching-up Greece, Spain and Portugal. On the other hand, oil intensity is equal to or slightly below the EU average for all acceding countries except for Slovenia, Latvia and Cyprus.

The future sensitivity of inflation and inflation divergences to oil price

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[9]   *No comparable data for Malta. Lithuania is not shown in the chart due to limited scale (oil dependency ratio: 0.29%, oil intensity: 74%).*

shocks will depend on the further disentanglement of oil demand from GDP growth. Technological progress, the shift from the industry to the service sector, the development of new energy sources as well as energy-saving measures are key factors in this respect. The need for improvement still seems to be huge, especially in the acceding countries.

3.3 Price Level Convergence

There is a group of factors that are all related to price level convergence. If prices expressed in a common currency are initially different across countries, convergence to a common price level implies higher inflation in countries with initially lower prices. Section 3.3.1 deals with price level convergence with a special focus on tradable goods. In this case convergence is a direct consequence of progress towards a single European market. Trade liberalization and the completion of Stage Three of EMU are well in progress and should therefore be of transitory nature. Section 3.3.2 summarizes evidence of the Balassa-Samuelson effect that works through convergence of nontradable goods prices. As this phenomenon is related to the gradual process of convergence of productivity, the impact on inflation differentials can be assumed to be of longer-term importance. Section 3.3.3 takes a look at the relative weights of HICP subgroups within the overall index. Sections 3.3.4 and 3.3.5, finally, assess the importance of regulated and administered prices as well as taxes for inflation differentials.

3.3.1 Price Level Convergence for Tradable Goods

Differences in price levels may provide a potential explanation for diverging inflation developments in European countries. If price levels are initially different across countries, convergence towards a common price level implies higher inflation rates in countries with initially lower price levels during the transition period. The driving force behind price level convergence is the progress towards a single European market, ranging from trade liberalization to the adoption of the single currency. While the first factor should already have materialized to a large extent for the current EU Member States, there is still further convergence to be expected through increased transparency following the introduction of the common currency.

To compare price levels in different countries, Rogers (2001) constructs a proxy for the price level in each country. For this purpose, data is obtained from the Economist Intelligence Unit, which has calculated a cost-of-living index for major cities worldwide since 1981 on a yearly basis by directly recording local prices of specific goods like bread, a pair of blue jeans, a haircut or the rent of an apartment. The aggregated price level data – based on actual prices of 168 goods for 26 cities in 18 countries – provide evidence in favor of price level convergence in Europe. Between 1990 and 1999 prices became less dispersed in the euro area. Convergence was especially evident for tradable goods and stronger in the first half of 1990s. The statistically significant and robust negative relationship between 1999 price levels and the 2000 aggregate inflation rate in Europe may indicate that price level convergence is an important factor in explaining inflation differentials also for more recent data, especially for the low-price countries Greece, Portugal and Spain.

Chart 6

Price Levels in the Euro Area and in the Acceding Countries,

2002 (EU-15=100)[1]
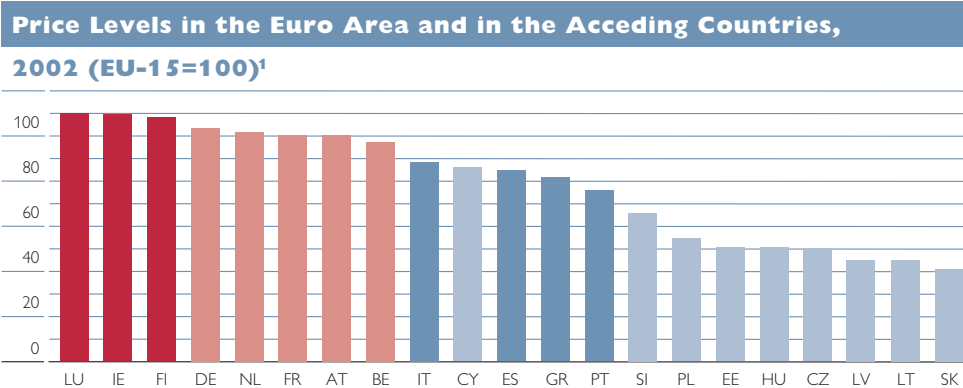
Source: Eurostat/NewChronos.

[1] Price levels are standardized by using the EU-15 and not the EU-12 average in the denominator. The reason for this is that these are official
calculations by Eurostat. However, note that the difference between averages based on the EU-15 and on the EU-12 are rather insignificant.

Obviously, price levels for major cities cannot be viewed as representative for the national price level. A more appropriate data set can be obtained from the International Price Comparison program launched under the aegis of the United Nations during the 1970s, which provides a unique dataset of price levels. Price levels of the EU Member States and the acceding countries are calculated by Eurostat on the basis of price data of reasonably comparable goods and services, expressed in terms of the EU-15 average. Chart 6 shows that in 2002 there were still substantial differences in price levels across the euro area. A closer look reveals that these differences can be observed basically between three homogenous subgroups of euro area countries: the countries with the highest relative price level, Luxembourg, Ireland and Finland, the second group, denoted as the core countries group, consisting of Austria, Belgium, France, Germany and the Netherlands, which exhibit very similar price levels with a maxi-

mum deviation of 6.5%, and finally the group of Mediterranean countries, Italy, Spain, Greece and Portugal;[10] the latter have price levels that are by up to 25 percentage points lower than the EU average.

Regarding the acceding countries, chart 6 reveals a huge gap between them and the euro area.[11] The price level of most acceding countries is half as high as in the euro area. An exception is Cyprus, whose price level is comparable to that of the Mediterranean EU countries.

Based on a Eurostat dataset including roughly 40 components of the overall price level, we classify prices into six categories: durable goods, semidurable goods, foods, market and nonmarket services and real estate prices. Based on the same four groups of countries like chart 6, table 2 shows that goods prices are highest in group 1 and provides some evidence for price level convergence for durable goods. Note also that prices of durable goods seem comparable also for the acceding countries. However, it turns out that

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[10] It should be mentioned that Italy is somewhere between group 2 and 3. As we will see, in some respect, Italy could be assigned to group 2 whereas in other cases, it shows more similarities with the other Mediterranean EU Member States.

[11] Data for Malta are not available.

Table 2

Relative Price Levels of Goods and Maximum Deviations, 2002[1])

	Group 1	Group 2	Group 3	EU-12	CEEC-8	EU-12 + CEEC-8
Average price level relative to the EU-15 average (EU-15 = 100)	%					
Durable goods	110.0	101.5	99.0	×	88.7	×
Semidurable goods	108.3	102.8	89.1	×	68.2	×
Food	115.0	99.2	90.2	×	68.5	×
Maximum price level over minimum price level within the group	percentage points					
Durable goods	0.18	0.05	0.16	0.27	0.19	0.44
Semidurable goods	0.32	0.20	0.21	0.55	0.53	2.52
Food	0.19	0.13	0.19	0.51	0.45	1.78

Source: Authors' own calculation based on data obtained from Eurostat.
[1]) Group 1: Finland, Ireland, Luxembourg; Group 2: Austria, Belgium, France, Germany, the Netherlands; Group 3: Greece, Italy, Portugal, Spain; CEEC-8: CEEC-5+3 Baltic countries.

prices deviate the least among the core countries, i.e. Austria, Belgium, France, Germany and the Netherlands. By contrast, in the case of the Southern European countries, intragroup differences are by far higher compared with the core countries.

At the same time, the price level of semidurable goods and foods is still considerably below the EU-15 average in Greece, Italy, Portugal and Spain. One reason for this might be that their price level is determined to a greater extent by local conditions, given that these goods are less tradable internationally and more labor intensive and have a larger service component. As a consequence, in countries with lower wage and service price levels, such as Greece, Italy, Portugal and Spain, prices for this kind of goods are also lower. Finally, the patterns emerging for the Southern European euro area countries are all the more true for the acceding countries. For instance, for semidurable goods and foods, the price level in the most expensive euro area country is roughly twice as high as in the cheapest CEE acceding country.

3.3.2 Price Level Convergence for Nontradable Goods: The Balassa-Samuelson Effect

Let us now turn to the price level of nontradables, more specifically to services. In general, service prices are believed to be more dispersed than goods prices. This seems to be confirmed in table 3, which shows deviations as high as 91% and 138% in nonmarket services and property prices, respectively, throughout the entire euro area. As in the case of goods prices, there is a relatively high price homogeneity within groups 1 and 2 and higher dispersion across Southern European countries. It is noteworthy that prices of market services are strikingly similar across the core countries and within group 1. But more importantly, the price level of both market and nonmarket services is by about 20% lower in the Southern European countries compared with other euro area countries. This also holds true for property prices, which differ by more than 30%.

In the acceding countries, market service prices were half as high as in the euro area, and the difference in nonmarket services and property prices is even larger: The difference between the highest and the lowest price levels amounts to 185% for market

Table 3

Relative Price Levels of Services and Maximum Deviations, 2002[1])

	Group 1	Group 2	Group 3	EU-12	CEEC-8	EU-12 + CEEC-8
Average price level relative to the EU-15 average (EU-15 = 100) %						
Market services	105.6	102.9	81.1	×	55.5	×
Nonmarket services	110.8	101.5	83.2	×	41.3	×
Property prices	113.2	106.4	68.6	×	41.5	×
Maximum price level over minimum price level within the group percentage points						
Market services	0.03	0.08	0.23	0.48	0.56	1.85
Nonmarket services	0.10	0.23	0.69	0.91	1.34	3.30
Property prices	0.28	0.30	0.54	1.38	0.62	3.58

Source: Authors' own calculation based on data obtained from Eurostat.
[1]) Group 1: Finland, Ireland, Luxembourg; Group 2: Austria, Belgium, France, Germany, the Netherlands; Group 3: Greece, Italy, Portugal, Spain; CEEC-8: CEEC-5+3 Baltic countries.

services and is as large as 330% and 358% for nonmarket services and property prices, respectively.

All this leads us to conclude that at present, the euro area is composed of a core region, i.e. group 2, and a group of countries (group 3) that is still in a catch-up phase. Besides, there are some outliers such as Finland, Ireland and Luxembourg. The adoption of the euro by the acceding countries would lead to more heterogeneity within the euro area: in addition to the core countries, two groups of countries at different stages in the catch-up process would emerge.

The Balassa-Samuelson (BS) effect is one popular explanation for differences in service prices. Let us assume a country with two sectors, an open sector producing tradable goods and a closed sector producing nontradable goods. Given that wages are assumed to be linked to labor productivity in the open sector and because wages are expected to equalize across sectors, the price level of the closed sector is determined by the productivity level prevailing in the open sector. This is one reason why in countries with lower productivity levels in the open sector service prices tend to be lower.

Table 4

Inflation Due to the Balassa-Samuelson Effect

	Austria	Belgium	Germany	Spain	Finland	France	Greece	Ireland	Italy	Nether-lands	Portugal
percentage points											
Alberola-Tyrväinen (1998)											
1975−1993/96	1.8	3.1	1.3	3.1	2.4	1.7	×	×	2.4	2.3	×
1985−1993/96	1.5	2.7	1.3	3.5	1.5	1.6	×	×	2.4	2.1	×
Swagel (1999)											
1960−1996	×	1.7	0.3	×	1.4	0.2	0.8	×	1.8	0.5	2.0
1990−1996	×	0.2	0.0	×	×	−0.2	1.7	×	1.4	0.4	1.2
Aitken (1999)											
Forecast based on 1993−1996	×	×	×	×	×	×	×	2.9	×	×	×
Sinn-Reutter (2001)											
1987−1993/95	1.4	0.8	×	1.5	2.4	1.3	×	2.4	1.5	1.4	0.8
1991/1995−1997/99	×	×	×	×	×	×	4.3	×	×	×	×
Canzoneri et al. (2002)											
1973−1991	1.2	2.4	×	1.5	1.0	1.1	×	×	2	×	×
1973−1997	0.8	1.6	×	1.4	1.6	1.4		×	1.8	×	×
Lommatzsch-Tober (2003)											
1995−2002	1.5	1.0	0.1	0.4	1.2	1.5	−0.1	2.6	0.5	0.6	−1.0
AVERAGE	**1.4**	**1.7**	**0.6**	**1.9**	**1.6**	**1.1**	**1.7**	**2.6**	**1.7**	**1.2**	**0.8**

Source: Authors' own calculations based on the original papers.

Further to this, in the event that productivity growth is higher in the open sector due to catching up, unit labor costs and thus also prices will consequently increase faster in the closed sector. This implies that inflation rates will be higher the more pronounced productivity differentials are between sectors in any country. In the long run, the importance of the BS effect should slowly diminish in parallel to the progress of catching-up.

Table 4 summarizes the existing evidence in the literature on the magnitude of the BS for the euro area. There seems to be a common understanding that the magnitude of the effect tends to be slightly higher in the typical catching-up countries such as Spain and Greece. Notwithstanding its catching-up country status, the BS effect turns out fairly weak in Portugal. On the other hand, Belgium, Finland, Ireland and Italy record above-average inflation rates imputable to productivity growth. However, based on the most recent dataset taken from the studies summarized in table 4, Lommatzsch and Tober (2003) suggest that the BS effect is strikingly weak in Greece, Portugal and Spain, whereas it is found high in low-inflation countries such as Austria, Belgium, Finland and France.

The BS effect has become very popular in explaining high inflation rates in the acceding countries. Table 5 summarizes the currently available estimates of the size of domestic inflation that can be attributed to the BS effect. A first strand of papers supports the view that productivity-induced service inflation, estimated to amount to up to 9%, has been at the root of high inflation in the acceding countries. However, recent research has demonstrated that this structural inflation is considerably lower. It amounts to only up to 3 percentage points in Hungary, Poland, Slovakia and Slovenia and to less than 1 percentage point in the Czech Republic and the Baltic States. The estimates show that the size of the BS effect differs substantially across the acceding countries. The reason for such a low BS effect in the acceding countries is mainly the low share of services in the CPI. Hence, larger productivity gains cannot fully feed into overall inflation. But at the same

Table 5

Inflation Due to the Balassa-Samuelson Effect

	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Poland	Slovak Republic	Slovenia
	percentage points							
Backé et al. (2003)	0.6	×	4.7	×	×	9.6	×	3.7
Golinelli/Orsi (2001)	4.3	×	0.2	×	×	5.1	×	×
Rosati (2002)	1.2	2.2	4.1	×	×	3.9	×	2.2
Rother (2000)	×	×	×	×	×	×	×	2.8
Sinn/Reutter (2001)	2.9	3.4	6.9	×	×	4.2	×	3.4
Flet et al. (2002)	0.2	×		×	×	×	×	×
Mihaljek (2002)	0.3	×	1.6	×	×	1.4	0.6	0.6
Égert (2003)	×	1.3	×	×	×	×	×	×
Halpern/Wyplosz (2001)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Kovács et al. (2002)[1]	0.7	×	2.5	×	×	×	×	1.3
Kovács/Simon (1998)[1]	×	×	2.2	×	×	×	×	×
Kovács (2001)[1]	×	×	2.1	×	×	×	×	×
Égert (2002a)[1]	0.8	×	2.1	×	×	2	0.5	1.2
Égert (2002b)[1]	0.8	×	2.0	×	×	2.5	−0.1	0.1
Égert et al. (2003)[1]	0.4	0.7	1.4	0.3	0.5	2.2	2.1	1.3

Source: Authors' own calculations based on the original papers.
[1] The inflation differentials originally computed against Germany are corrected using 0.6% from table 4.

time, its size is comparable to that in the euro area.

A closely related issue is wage flexibility, given that one of the preconditions for the BS effect to work is wage equalization between the open and closed sectors. In theory, the presence of strong and well-established trade unions enforces equal wage increases across sectors. Riboud et al. (2002) analyzed institutional reforms and the labor market performance in the CEECs in the 1990s. Although these countries have been adopting the set of policies and institutions common to EU Member States, some diversity among the CEECs persist. As a result, some countries have a more flexible labor market than others. However, when compared to EU and OECD members, most of the CEECs tend to be in the middle of the "labor market flexibility" scale.

The importance of trade unions has been decreasing in all the CEECs since the end of the 1980s, when virtually 100% of the labor force were union members. During the last decade, these countries moved away from purely centralized wage bargaining systems towards a more liberalized regime of wage negotiation. This development was supported by a huge number of newly created firms in the private sector. Meanwhile trade union density dropped in all transition countries to less than 35% on average (Paas, 2002), with Slovenia on the upper end and the Baltic countries on the lower end of the range. Interestingly, the coverage of collective agreements is not much higher than union membership, which can be traced mainly to the small number of sectoral or regional level agreements. Therefore most employees in the CEECs rely on individual employment contracts. This situation fosters

wage diversification and dampens the BS effect.

The relatively high labor mobility in the CEECs on the other hand fosters wage equalization. This mobility is a consequence of the fundamental structural change that characterized the transformation process in the CEECs and thereby led to a complete restructuring of labor demand. In terms of labor reallocation, the size of the agricultural sector has decreased. In addition, the countries have experienced a process of deindustrialization, while employment in the service sector has increased. Apart from this, major shifts have also occurred within sectors, e.g. in the manufacturing sector, which has become more concentrated in geographic terms (Hildebrandt and Woerz, 2004). These structural changes to some extent went hand in hand with labor reallocation across economic sectors and the adjustment of wages, but also with changing patterns of labor force participation and rising unemployment.

3.3.3 Differing Weights in the CPI Basket

Another factor that can play a relevant role for inflation differentials is the weight of different groups of goods and services in the national CPI basket. In the Mediterranean countries services have less whereas food and goods have higher CPI shares compared with the rest of the euro area. The differences between the euro area and the acceding countries are even larger. Table 6 reveals that the weight of services in the acceding countries is by up to 15 percentage points lower than the euro area average. In addition to this, it turns out that the share of goods, in particular of durable goods, is also smaller. By contrast, the rela-

Table 6

HICP Weights in the Euro Area and in the Acceding Countries, 2002							
	Goods	*thereof*			Energy	Food	Services
		Durables	*Semidurables*	*Nondurables*			
	%						
Estonia	27.30	5.70	12.90	8.70	12.60	33.10	27.00
Latvia	24.50	5.70	9.00	9.90	12.90	37.80	24.80
Poland	26.70	4.20	9.20	13.40	14.30	35.20	23.80
Slovenia	30.10	11.60	11.00	7.50	12.90	25.90	31.00
Czech Republic	26.40	8.70	9.80	7.90	13.90	28.60	31.20
Hungary	28.40	8.20	10.40	9.80	13.50	28.60	29.00
Cyprus	34.20	12.60	13.10	8.40	7.50	23.20	35.20
Euro area	**31.20**	*11.30*	*11.80*	*8.10*	**8.20**	**20.90**	**39.70**

Source: Eurostat/NewChronos.

tive weight of goods related to basic needs such as energy and food in the acceding countries exceeds that of the euro area by far.

Weights represent the structure of households' consumption expenditure, which in turn is closely related to the degree of economic development and households' preferences. According to Engel's Law, the higher the disposable income, the less households spend on food. The generalization of this idea is that the higher the GDP per capita, the more households spend on services and less on foods and other durable and nondurable goods. This is also the case in the euro area, where the share of services increased from 33% to 40% between 1995 and 2002. At the same time, the share of goods, food and energy items decreased from 33%, 25% and 9% to 31%, 21% and 8%, respectively.[12]

The implication of all this is that in the event of economic convergence, the acceding countries will witness changes in the structure of household consumption and thus in HICP weights, namely an increasing share of services and a decreasing share of foods. On the other hand, however, the share of goods, and especially that of durable goods, is particularly low in the Baltic countries and in Poland, indicating the scope for a possible increase in relative durable consumption and in the corresponding weights. Hence, merely changes in weights might lead to differences in inflation rates. However, since these changes caused by economic development will take time,[13] their effect should not be overemphasized.

3.3.4 The Role of Regulated and Administered Prices

Government policy can have an important effect on inflation rates through changes in regulated and administered prices. The former relates to goods and services that are provided by the private sector but whose

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[12] It should be noted that changes in weights can be decomposed into price and volume effects. For instance, the share of services could have increased because households consumed more but also because of increases in service prices. All the same, the relative importance of goods in the consumer basket may be the result of relatively less consumption falling on these goods coupled with market liberalization leading to decreases in goods prices.

[13] Even if in the transition countries the CPI goods basket may change more quickly, the past adjustment of weights in the euro area can offer some guidance on future trends. A very simple calculation based on table 6 shows that in Poland it would probably take 15 years for the share of services in the basket to increase to 40%, a level comparable to that in the euro area, whereas in the Czech Republic and in Slovenia, this level would be reached already in some 10 years' time.

Chart 7

Administered Prices in Germany

annual change in %

- Administered prices
- National CPI

Source: Federal Statistical Office of Germany.
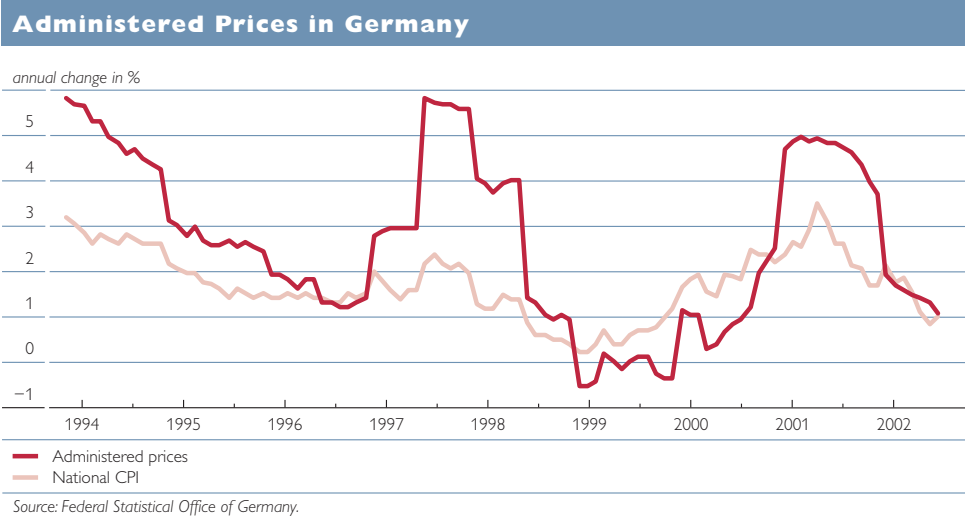
prices are fixed or subject to price ceilings. Typical examples are housing rents, prices for books or certain foodstuffs. The latter refers to fees charged for servi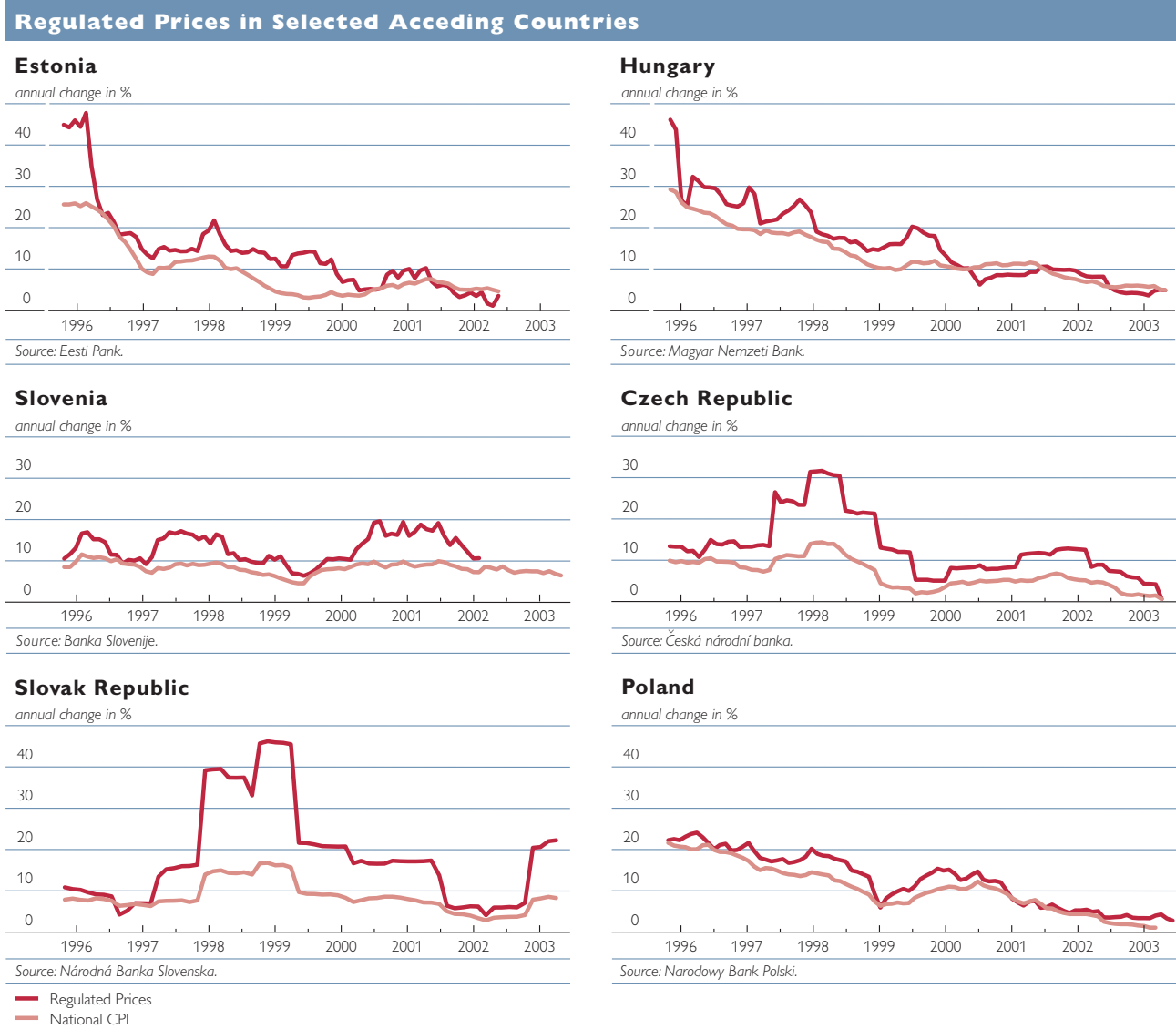ces provided by the government, for example charges for a new passport or parking fees. A large group of products can in principle be supplied by both the private and the government sector. Typical examples are fees for certain services in the health and education sectors, prices for water and energy supply, passenger transport fares, telecommunication rates and tobacco prices. In these cases price adjustments may occur following discretionary government decisions, but also as a consequence of the opening of these markets to competition through privatization.

As long as changes in regulated and administered prices happen in a systematic manner across countries they should not play a major role in determining inflation differentials within the euro area.[14] The recent past, however, has seen examples of situations where these price adjustments occurred in a more unsystematic way so that their impact on in-

flation differentials may have been significant. The first example is the liberalization of network industries within the framework of the EU Cardiff process. As the speed of opening up these sectors differed considerably from country to country, an influence of these privatization measures on inflation differentials cannot be ruled out. Second, some countries may have used adjustments of administered prices in a more systematic manner in the run-up to EMU as a tool to consolidate their budgets or to lower their national inflation rates to fulfill the Maastricht convergence criteria. The third example of an increased role of administered price adjustments may have been the euro cash changeover. While the overall price effects of the introduction of euro banknotes and coins remained limited, there was evidence for some countries that the months before and after the cash changeover saw a high concentration of adjustments of fees and charges.

In chart 7, the example of Germany illustrates the importance of administered prices for inflation developments. Changes in administered

[14] In what follows, the terms "administered" and "regulated" prices will be used interchangeably.

Chart 8

Regulated Prices in Selected Acceding Countries

Estonia
annual change in %

Hungary
annual change in %

Source: Eesti Pank.

Source: Magyar Nemzeti Bank.

Slovenia
annual change in %

Czech Republic
annual change in %

Source: Banka Slovenije.

Source: Česká národní banka.

Slovak Republic
annual change in %

Poland
annual change in %

Source: Národná Banka Slovenska.

Source: Narodowy Bank Polski.

— Regulated Prices
— National CPI

prices are found to have a significant impact on overall CPI inflation, partly due to their high weight of nearly 20% in the CPI basket. Adjustments of administered prices played an especially important role in the run-up to EMU and during the year 2001 when these items saw inflation rates of 4% to 6% and thereby exceeded headline inflation considerably.

In general, however, it can be assumed that the relevance of some of the factors underlying changes in administered prices will vanish in the near future. The run-up to EMU and

the cash changeover are past events that should no longer play a significant role. Once the major wave of liberalization of network industries is over, the importance of these price adjustments for inflation differentials may also disappear. Yet, regulated prices are likely to continue to impact on inflation for several reasons. First, since some sectors will remain in public hands for strategic or political reasons, prices in these sectors will not be determined by market forces; second, despite possible privatizations, in areas such as water supply or the rail-

ways, prices may continue to be set or at least be heavily influenced by public regulatory bodies because perfect competition is hardly conceivable in these industries.

In the acceding countries, administered prices play an even more important role, as they constitute a significant share of consumer price indices with a weight varying from about 10% to 25% in the national CPI. According to the 2001 Regular Reports of the European Commission, the share of regulated prices in the CPI is as follows: 18% in the Czech Republic, 15% in Estonia, 18.5% in Hungary, 22% in Latvia, 20.5% in Lithuania and 12.7% in Slovenia. According to national central bank reports, the share of regulated prices in the consumer price index is as high as 25.7% in Poland (2001) and 21.1% in Slovakia (2002).

In the acceding countries, administered prices represent not only a large chunk of CPI but their adjustments, usually related to domestic politics, may be massive, abrupt and systematically higher than the CPI. The transposition of the national CPI and administered prices in chart 8 illustrates this phenomenon for the Czech Republic, Estonia, Hungary, Slovakia and Slovenia.

The underlying factors of huge past and possible future increases in administered prices are threefold. First, administered prices were kept unchanged during the 1990s when other prices were liberalized. Therefore, large changes in administered prices merely mirror a late catch-up with other, chiefly market service prices. Second, a part of administered prices is still below cost recovery,

which implies further room for future increases. Third, the majority of regulated sectors are capital intensive. Prices below cost recovery, which do not allow for capital maintenance costs, go hand in hand with an ever increasing need for capital investments so as to improve quality and to close the gap to constantly improving EU standards. Consequently, sooner or later capital investments are to be taken into account.

3.3.5 The Role of Taxes

It is widely acknowledged that differences in indirect taxes, such as VAT and excise taxes, are likely to play a nonnegligible role in differing price levels across euro area countries, as shown in chart 9. Finland and Ireland, the countries with the highest price levels, have the highest standard VAT rates in 2003, whereas the core countries have rates ranging from 19% to 21%.[15] Finally, Greece, Portugal and Spain apply below-average rates. The same applies to the reduced rates: countries with lower price levels tend to have lower reduced VAT rates. In addition, Greece, Portugal and Spain apply these rates more frequently. Of the 12 euro area countries, six, among them Greece, Italy and Spain make use of so-called super-reduced rates, which vary from 2.1% to 4.3%. Indeed, the price level and the VAT system appear to be linked in the euro area.

In contrast, low price level acceding countries have comparable or even higher standard and reduced VAT rates than countries in the euro area. For instance, Hungary and Slovakia have a standard rate of 25% and 23%, respectively, and it is 22% in the Czech Republic and Poland. Hence, the

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[15] It is worth recalling that EU Member States can apply the following four types of VAT rates: standard, reduced, super-reduced and zero rates. This can be completed by exemptions to VAT.

Chart 9

Standard and Reduced VAT Rates, 2003

Standard VAT
Reduced VAT

Source: European Commission, 2003.
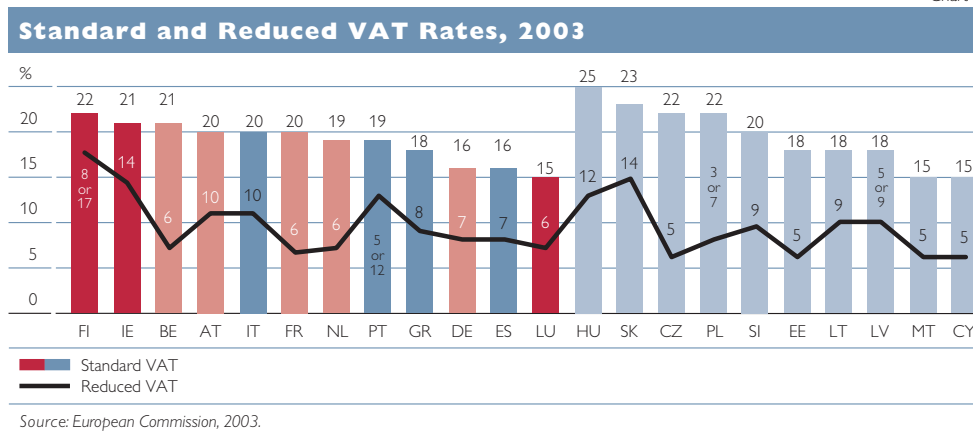
overall burden of indirect taxes is presumably higher in the acceding countries when compared with the euro area. Therefore, the huge gap in price levels between the euro area and the CEE acceding countries is apparently not a result of differing VAT rates.

Given the relevance of indirect taxes for euro area price level differences the question to be addressed subsequently is the extent to which changes in VAT rates may have contributed to price level convergence or divergence over the last decade. It turns out that VAT rates increased slightly in Italy, Spain and Portugal. So did they in the case of Germany and the Netherlands whereas they stayed unchanged in the remaining countries except for Ireland, where the standard rate decreased somewhat. The European Commission is currently seeking to simplify VAT regulations by limiting the use of zero and super-reduced rates. Another objective is that reduced rates should be used more homogeneously throughout the EU. If these amendments to the sixth VAT Directive will be applied, prices in countries using extensively super-reduced rates may in-

crease and they may decrease in countries introducing reduced rates (European Commission, 2003). This step is likely to contribute to dampening the impact of taxes on price levels.

When it comes to the acceding countries it should be noted that in the framework of their Pre-Accession Economic Programs (PEP), countries applying reduced rates, i.e. the Czech Republic, Hungary and Poland, committed themselves to shift a limited number of items, mainly services, from reduced rates to standard rates. In addition, the Hungarian government decided to increase the reduced VAT rates from 0% and 12% with effect from January 1, 2004, to 5% and 15%, respectively, in an attempt to consolidate public finances. Since standard rates will apply for a number of items for which currently only reduced or null rates are used, the Hungarian central bank (Magyar Nemzeti Bank) expects the year-on-year inflation rate to increase to 5.8% by end-2004. Also, Slovakia recently introduced a flat rate of 19% that is applied not only to VAT but also to income and corporate taxes.

4 Conclusions

Since the beginning of the 1990s, the magnitude of inflation differentials has decreased significantly, not only for the EU-12 or the EU-15 but also for the EU-15+10. This reflects a convergence of inflation rates in the EU and an overall disinflationary process in the acceding countries, which is chiefly driven by a stability-oriented macroeconomic policy. The often cited catching-up factors, which would work in the opposite direction, seem to be weaker than generally thought. But despite a dramatic convergence of inflation rates, inflation differentials did not vanish completely in the EU-12. They became a sensitive issue recently because sometimes they are wrongly taken as a backward-looking benchmark for the success of a monetary union.

There are a number of potential causes of inflation differentials. They range from cyclical factors via the exchange rate pass-through and oil price shocks to differences in productivity advances and changes in indirect taxes. An overview of these factors and of their impact on different groups of EU countries reveals similar patterns across countries. For instance, a similar degree of openness is expected to result in a quite similar exchange rate pass-through, and the same applies to oil dependency and oil intensity, factors which are key to the pass-through of an oil price shock.

Therefore, economies with a higher degree of openness, such as Belgium, the Netherlands and all the acceding countries (except for Poland), are expected to be more sensitive to changes in the exchange rate. Similarly, economies that are more dependent on oil imports or rely on more oil intensive industries are more exposed to oil price shocks. The acceding countries appear to be very similar to the Mediterranean countries in this respect.

Also, the acceding countries are often found close to the EU Mediterranean countries with regard to price levels. Although the price level of durable goods in these countries is roughly in line with prices in the euro area, service prices turn out to be half as high as in the euro area or even lower. However, recent calculations for the BS effect demonstrate that even though service price inflation might be driven by productivity gains, its impact on overall price inflation is rather small and that the size of the BS effect in the acceding countries is comparable to that found in the euro area.

In addition to this, whereas regulated and administered prices are a distinct feature of inflation determination in the acceding countries, one can also find surprisingly high shares of this kind of prices in EU-15 countries, fairly often misused to consolidate public households. Different indirect tax rates, especially concerning the VAT, are another factor determining price levels. VAT rates may still differ across countries, but there are ongoing efforts to harmonize the tax rates in the EU. Also, VAT rates in the acceding countries are well in line with those in the EU-12.

All said, it should be noted that the causes and extent of inflation differentials in the acceding countries do not differ fundamentally from those in the current EU Member States. Economic analysis of this phenomenon can hence rely on existing explanatory approaches and experience made in the industrialized countries so far.

However, the acceding countries' medium-term objective of introducing

the euro will bring the topic of inflation differentials back into focus. After all, the convergence criterion on price stability embodied in the Maastricht Treaty also relates to inflation differentials, establishing the reference value on the basis of the average of the three countries with the lowest inflation rates. For the single monetary policy, inflation differentials in general play a subordinate role, since in its monetary policy decisions the Euro-system primarily takes into account the inflation rate of the euro area as a whole. As in the past an appropriate interplay of fiscal and structural policies – the instrument for inflation targeting at the national level – best ensures a smooth adjustment process in the new Member States.

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The International Financial Architecture: Official Proposals on Crisis Resolution and the Role of the Private Sector

Christian Just

The absence of a clear framework for the resolution of international financial crises introduces many risks and raises legal uncertainties about how to deal with sovereign financial crises. While a fairly broad consensus exists on how to prevent financial crises, namely by strengthening macroeconomic policies and improving financial supervision and regulation, views on how to manage and resolve sovereign debt crises are rather diverse. At the International Monetary Fund's (IMF) annual meeting in Prague in the year 2000, the international community tried to address this issue by advocating the Private Sector Involvement (PSI) initiative.

PSI, however, never amounted to more than public statements that lack in substance. Consequently, this led to widespread dissatisfaction among the main participants of the international financial architecture. Debtor countries grew more discontented with the governance of the international financial system, and the private sector started to accuse the IMF of increasing the time inconsistency of its policies.

Finally, in November 2001, the Deputy Managing Director of the IMF, Anne Krueger, proposed a legal framework for the resolution of sovereign insolvency crises, a Sovereign Debt Restructuring Mechanism (SDRM). This mechanism would have rendered PSI more operational, in addition to addressing many market failures of today's international financial architecture. This paper addresses some of the key issues related to the international financial architecture and the resolution of sovereign debt crises. It is important to note that while support for an SDRM has waned for the time being, its discussion has nevertheless been beneficial and has produced several tangible results.

1 Introduction

The absence of a clear framework for the resolution of international financial crises introduces many risks and raises legal uncertainties about how to deal with sovereign financial crises. At the IMF's annual meeting in Prague in the year 2000, the international community tried to address this issue primarily by advocating the PSI initiative.[1]

The PSI initiative encapsulates the official sector's attempt to engage the private sector in crisis resolution more effectively.[2] It has three main objectives. First, PSI relates to the financing function the private sector has for capital-scarce emerging markets, in particular given the limited amount of official resources available for development. Second, the PSI initiative is meant to convince the private sector not to panic in the event of a sovereign's payment difficulties. An escalation might cause private sector investors to retreat from emerging markets, which could amplify the crisis and, in addition, spark contagion. Third, PSI is the official sector's attempt to encourage the private sector to assume responsibility for its investment decisions. This is grounded in the official sector's conviction that a collectivization of private sector losses would distort the allocative efficiency of capital markets and would lead to moral hazard via increased risk taking.

PSI, however, never amounted to more than public statements that lacked in substance. Consequently, this led to widespread dissatisfaction in the international community. Debtor countries grew more discontent with the governance of the international financial system, and the private sector started to accuse the IMF of increasing the time inconsistency of its policies, which may have contributed to abrupt reversals of capital flows to and from emerging markets.

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[1] On the concept of PSI, see in particular IMF (1999).

[2] The starting point for crisis resolution should be crisis prevention, which will, however, not be covered in this paper owing to space constraints. There are several excellent papers on this topic; see e.g. Fischer (2002).

Finally, in November 2001, the Deputy Managing Director of the IMF, Anne Krueger, proposed a legal framework for the resolution of sovereign insolvency crises, a Sovereign Debt Restructuring Mechanism. This mechanism would have rendered PSI more operational, addressing many market failures of today's international financial architecture.

This paper explores the main problems and initiatives in the context of sovereign debt crisis resolution. Section 2 describes the IMF's SDRM proposal in the context of PSI and the reasons why it failed to be supported by some of the main actors involved. Section 3 deals with the rationale for bankruptcy procedures and the increasing incidence of sovereign default. This is followed in section 4 by a closer look at the incentives for a more orderly sovereign debt restructuring process and the main market failures such a mechanism has to address. Section 5 briefly discusses the state of play and outcomes of the SDRM debate, and section 6 concludes.

2 How to Involve the Private Sector in Crisis Resolution

Many of the perceived shortcomings of today's international financial system are traceable to the shift in governance from an administered government-led system to a decentralized market-based system (Padoa-Schioppa and Saccomani, 1994). The latter purportedly offers an opportunity for greater efficiency and resilience, whereas the former is deemed as being too costly for national economies and too threatening to the stability of the international financial system. However, the current international financial architecture shows signs of a discrepancy between the "old" model of bilateral or IMF crisis lending and the "new," yet imprecise, model aiming at transferring more responsibility to negotiations between creditors and borrowers, which has resulted in messy, difficult and uncertain crisis resolution (Kahler, 2000).

An attempt to bridge this gap was the Private Sector Involvement initiative. Instead of bridging the gap, the PSI initiative, however, quickly exposed a gap between the official position of no bailouts and the continued actual practice of bailouts. The official community never stated whether PSI was supposed to be voluntary or coercive and what a coercion mechanism would encompass. As Eichengreen et al. (2003) observed "(it was) a strategy built on statements of intent that (did) not change the underlying payoffs (and thus) was not taken at face value. Because it was not credible, it will not change the strategies of market participants. Therefore, it will not change the results of their interaction with the multilaterals and the debtor."

While this strategy has seen countries, such as Mexico and South Korea, return to sustained growth with independent access to private sector finance, it has also resulted in a number of cases of extended reliance on international – usually IMF – support, e.g. in Indonesia, the Philippines, Turkey and Brazil.

PSI imposes a number of costs on the international financial system, with the great ambiguity that attends crisis resolution the most important factor. The various participants' roles and responsibilities are largely undefined, as are the debtor's chances of receiving any official money and the amount of money that might be forthcoming. Such uncertainty undermines

confidence during a crisis and makes it virtually impossible for creditors to price the risk of sovereign debt prior to a collapse. The prospects for cooperative behavior are severely reduced by uncertainty, and creditors have a natural inclination to rush to the exits at the first signs of trouble.

The prospect of receiving an uncertain, but potentially large amount of official lending discourages appropriate pricing of risk on the part of the creditors. In addition, it may encourage both creditors and debtors in pursuing profit-maximizing and/or rent-seeking tactics, which are unhelpful in an overall context since both parties have an incentive to postpone meaningful negotiations until they have extracted as much money as possible from the IMF or bilateral donors. Experience, such as from Argentina, suggests that serious negotiations do not start until the official channel has been exhausted. Bailouts may encourage debtors and creditors to exercise less caution in their borrowing and lending activities. However, the degree of such behavioral biases is probably overrated.[3] Nevertheless, the trend towards ever-larger IMF packages may increase the odds of a serious moral hazard problem in the future.

The situation the official sector faces is similar to the lender-of-last-resort problem. Distinguishing between solvency and liquidity problems is difficult, and there has been a tendency to err on the side of optimism. Officials responsible for overseeing

crisis resolution efforts tend to have been involved in previous programs for the same country and may be reluctant to admit past errors. Although extending additional money is likely to lead to much larger problems in the future because of a potential negative signaling effect for other debtor countries, officials typically are preoccupied with the crisis at hand and are therefore unwilling to let the future take care of itself. Having recognized the danger of this time inconsistency, many domestic regulators enacted legislation to stiffen their resolve and to limit their ability to extend exceptional access to distressed commercial banks. No such disciplinary mechanism exists for the international community.

The framework for crisis resolution can only be successfully implemented if access to official financing is constrained by clear rules and underpinned by transparent decision-making criteria and procedures. Firm limits signal to the private sector and debtor countries that they cannot rely on open-ended assistance from the official sector. In September 2002, the IMF agreed on a set of principles to constrain its discretion in granting exceptional access to its resources.[4] And while since 1994 over 90% of IMF arrangements fell within the normal access limits of 100% of the country's quota annually and 300% cumulatively by end-October 2003, 85% of the IMF's exposure was concentrated on five countries (Turkey, Brazil, Argentina, Indonesia

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[3]   On moral hazard, see e.g. Dell'Arricia et al. (2002) or Kamin (2002).

[4]   The criteria for exceptional access encompass inter alia exceptional balance of payments difficulties resulting from financial account pressures that can only be relieved by Fund assistance above the normal limits; a high probability that the country's debt will remain sustainable; the member country has good prospects of regaining market access so that in the end the Fund's assistance would amount to a bridge loan; the country's policy program has a reasonably strong likelihood of succeeding, i.e. the administrative capacity and political will to implement an IMF program.

and Russia) that had received exceptional access.

Many tools needed for an orderly restructuring of sovereign debt crises were developed in the wake of the PSI debate, but the initiatives lacked an overarching edifice. In November 2001, Anne Krueger proposed establishing a legal framework, i.e. an SDRM, for the resolution of sovereign liquidity and insolvency crises. This framework was meant to limit creditors' ability to go to court against a sovereign debtor with an unsustainable external debt burden that is actively negotiating or implementing an IMF-supported program.

Many of these ideas had already been expressed in earlier proposals, e.g. by Jeffrey Sachs (1995). The international bankruptcy proposal initially made by Krueger was directed at countries with unsustainable debt burdens and was designed to promote orderly restructuring. The principal objective of the proposal was to induce sovereign debtors and their creditors to voluntarily negotiate the terms of the restructuring of an unsustainable debt position in cases where no voluntary agreement exists.

The SDRM proposal envisaged that a country with an unsustainable debt burden may obtain a temporary stay of litigation by its creditors if the IMF agrees (1) that its debt is unsustainable, (2) that the country has or is negotiating a program with the IMF, and (3) the country promises to negotiate in good faith with its creditors. The IMF could extend the stay, provided the program remained on track and the country continued to negotiate in good faith with its creditors. A restructuring agreement approved by a majority of creditors would bind all creditors once the IMF has approved it as being compatible with debt sustainability. The verification of claims, and of the majority required to bind all creditors, would be entrusted to a new quasi-judicial body that would be independent of the IMF. The legal basis of this approach would be statutory following an amendment of the IMF's Articles of Agreement.

This proposal would have contributed to making the PSI framework more operational. However, the SDRM proposal was subject to widespread criticism and, on the whole, received only lukewarm official support. Criticism largely focused on the IMF's role within the SDRM framework. NGOs, which had been demanding a fair and transparent arbitration process ever since Kunibert Raffer (1990 and 2002) espoused the idea of Chapter 9 proceedings for sovereigns,[5] dismissed Krueger's proposal for excluding civil society and giving too much discretionary power to creditors.

The private sector held that the envisaged process would curtail contractual rights and would thus lead to a drying up of capital flows to emerging market countries, a fear echoed by developing countries. In addition, the private sector was reluctant to have the IMF play such a dominant role in the administration of the process in the light of the strong political pressures that it is sometimes subject to and the inherent biases that might arise from prior engagement with a given country. Furthermore, national governments would be hard-pressed to cede the legislative powers necessary to make the new system operable.

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[5]   U.S. bankruptcy procedures for municipalities are based on Chapter 9.

Officials in the U.S. supported the proposal at first, although they also argued in favor of exploring alternative and more market-based solutions. Only European states welcomed the proposal with greater enthusiasm and saw it as a possible complement to the international financial architecture.

Subsequently, the IMF sought to address the criticism by offering an "SDRM light," which would have placed all the key decisions in the hands of the indebted country and a majority of its creditors. While the statutory basis for this approach would still have been created by amending the IMF's Articles of Agreement, the IMF would not have been given the power to limit the enforcement of creditors' rights. That decision would have been based on a process like the one found in existing collective action clauses (CACs) in sovereign bonds, but would have ensured coordination and aggregation among the holders of various bond issues and debt instruments. The vote of a majority of all creditors, and not the vote of a majority of the holders of a given instrument, would have been binding. There would still have been a need for a quasi-judicial body to verify creditors' claims and the majority needed to activate a stay or approve a debt restructuring.

These substantial modifications notwithstanding, the IMF failed to garner sufficient international official support, and by the end of 2002, it softened its proposals further and moved more and more towards a contractual approach (IMF, 2002c). The most serious shortcomings of the subsequent proposals included the exclusion of the automatic stay on creditor litigation, the absence of an authoritative independent assessment of the

sustainability of the debt, the lack of comprehensiveness and the aggregation problem.

Nevertheless a few marginal improvements over the contractual approach would have been achieved, such as an application to existing debt contracts, which would have overcome the stock problem under the contractual approach, the aggregation of debt across different instruments and the establishment of a certain seniority structure of claims for fresh funds. Lastly, if the SDRM had been established via an amendment of the Articles of Agreement, the IMF's preferred creditor status would have been put on an explicit legal basis.

Ideally, an SDRM restructuring agreement would be reached without formal defaults or in the shadow cast by the law, and thus without an interruption of payments. An SDRM should facilitate such pre-crisis and pre-default agreements as much as possible. Under such circumstances a stay of litigation would be superfluous since there would be no reason at all to litigate. However, if a country that activates the SDRM cannot avoid payment interruption, it should be protected from litigation during the SDRM procedure.

3 Sovereign Defaults – The Rationale for Bankruptcy Procedures

An orderly process for dealing with insolvency is an essential institution in a well-functioning market economy. Well-designed bankruptcy procedures enhance market discipline, protect creditors' claims and ensure a fair and predictable treatment of creditors. This requires, inter alia, that insolvency procedures be transparent. In all jurisdictions, the administration of bankruptcy procedures is largely

the responsibility of public authorities, particularly the courts or court-appointed administrators or liquidators. This notwithstanding, creditors themselves may have important collective decision-making powers under bankruptcy provisions.[6]

Both the IMF and the private sector insist that property rights need to be safeguarded to increase the attractiveness of an economy for foreign direct investment. Countries should therefore adopt adequate bankruptcy and foreclosure procedures. With orderly insolvency procedures being a necessary institution of a market economy, an orderly mechanism for restructuring sovereign debts – both external and domestic – should be an essential component of a well-functioning international financial system.

The concept of sovereignty dilutes the corporate bankruptcy analogy, though. Creditor rights against sovereigns are very limited as the assets of sovereigns generally enjoy immunity from attachment unless it is specifically waived. Organizing an orderly debt restructuring mechanism would clearly enhance the protection of creditor interests. For this reason, the determination with which mainly the private sector continues to oppose any kind of statutory SDRM is quite puzzling.

Creditors' attitude points to a moral hazard connection. In other words, creditors seem to believe that in the absence of an SDRM their claims will be better protected on the assumption that they will be bailed out by the IMF and other public lenders. This is why strict lending limits for the IMF would be a welcome means to reduce creditors' propensity to reject a restructuring proposal.

Similar to corporate bankruptcy procedures, an SDRM would promote efficiency by overcoming the collective action problem that arises when multiple creditors confront an insolvent debtor. A bankruptcy procedure would help curtail a creditor "grab race" that can undermine the value of an insolvent debtor's assets. An SDRM would promote equity by offering debtors a fresh start by discharging debt, which frees debtors from future collection efforts. It also leaves debtors with some exempt assets and with a future income stream to meet certain obligations and to safeguard future debt-servicing capabilities.

One of the main objections to a sovereign insolvency procedure is said to be the lack of real collateral and the fact that countries do not have an intrinsic value. Therefore market participants hold that defaults need to be bad and ugly so that debtors are deterred from defaulting or postpone a default as long as possible and thus play gambles for resurrection. The paradox is that what is bad for a country ex post is considered good beforehand since it potentially increases the supply of credit. Many emerging market countries then have argued that, given this scenario, an SDRM may frighten creditors, lead to a decrease in private capital flows to emerging markets and precipitate crises which would not have occurred otherwise.

The difficulty lies in designing an incentive mechanism which creates ex ante economic efficiency for debtors and creditors alike. If the law is too hard, it can deter investment because the probability of failure is too high. If it is too soft, lenders will charge an enormous markup since it

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[6] *For a discussion of different national bankruptcy procedures, see e.g. Bolton (2003).*

is unlikely that they will be repaid in full in the case of default.

Credit rating agencies generally define "default as the failure to meet a principal or interest payment on the due date (or within the specified grace period) contained in the original terms of the debt issue" (Beers and Chambers, 2003). Given this fairly narrow definition, 26 sovereign issuers were in default on various financial instruments in the third quarter of 2003 with a total value of approximately USD 126 billion.

Standard & Poor's observes that financial distress is a fundamental precondition for rescheduling both official and commercial debt and that local political and economic conditions remain the most important factors affecting the willingness and ability of governments to service debt. In the event of default, it is the capacity of governments to negotiate with creditors, rather than the framework under which negotiations occur, that remains key to the time it takes to resolve defaults.

One way of assessing whether a country is insolvent is by analyzing the sustainability of its debts.[7] Such analysis has become a major activity of both the official and the private sector. Its purpose is to detect situations in which countries might become unable to pay off their foreign obligations at their face values. Yet, as Eichen-green (2002) has observed, the assessment of debt sustainability is more art than pure science. In reality, it is hard to forecast future national output, interest rates and in particular a country's willingness to devote a significant share of its output to repaying foreign debt (Edwards, 2001). From a current account perspective, an economy's resource transfers to foreigners must be equal to the value of the economy's initial debt to them. Thus, the intertemporal constraint holds, if – and only if – a country pays off any initial foreign debt through sufficiently large future surpluses in its current account.

Countries borrow to smooth their intertemporal consumption (Obstfeld and Rogoff, 1999). Very simply put, low-income countries generate too little domestic saving to take advantage of profitable investment opportunities, and so they must borrow abroad. Capital-rich countries have more limited profitable investment opportunities but relatively high savings. Savers in developed countries can thus earn higher rates of return by financing investments in developing countries. Consequently, world welfare will be enhanced when capital flows from capital-abundant to capital-poor countries. There will be additional welfare effects if countries can use the current account and capital flows to stabilize their economies when faced with a negative shock.[8]

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[7] Ideally, the first step in activating a sovereign insolvency procedure would be a judgment by some independent body that a country's debt is unsustainable. Given its mandate to protect the stability of the international financial system, its near-universal surveillance and its financial role, the IMF seems an obvious first choice. That the IMF is itself a creditor should not affect its judgment since its own claims will remain immune to debt restructuring owing to its preferred creditor status. So far, the IMF's privileged creditor status is justified by its willingness to provide cheap new money when private creditors refuse to do so. The IMF's claims will therefore remain exempt from restructuring. So should any new money claims that private creditors provide after activation of the SDRM.

[8] A dissenting view states that due to governance problems in emerging market economies, the marginal productivity of capital is so depressed in such countries that an international capital transfer would be inefficient. For ways to overcome the original sin problem via, say, GDP-indexed bonds, see Borensztein and Mauro (2002).

Yet, many countries cannot borrow in their own currencies, i.e. they face what is referred to as the original sin problem.[9] Then, shocks to the real exchange rate can increase the difficulties a country has in servicing its debt. This, in turn, leads foreigners to restrict their lending.

Persistent current account imbalances are viewed as a portent of future borrowing problems. Most recent crises originated in the financial account, though. Therefore the focus has shifted from assessing only potential current account problems to the composition of their financing and thus to vulnerabilities that may originate in the financial account.

The debt crisis of the 1980s and the losses incurred by banks can be seen as a reason for the shift from medium-term syndicated lending towards shorter-term interbank lending and equity financing. Generally, the change in emerging market financing is positive for sovereigns owing to an increase in the investor base. Investors, in turn, can diversify risk better. However, emerging markets face a greater challenge when public and private borrowing is largely in foreign currency. After all, they not only have to accommodate the domestic fiscal balance but also satisfy an external constraint. By extension, future hard currency debt service will have to be paid with net export receipts. Otherwise countries would be able to run external Ponzi schemes that would depend on ever-growing future capital inflows for coping with pre-existing hard currency debt service. Eventually, though, exports must grow rela-

tive to imports for such countries to be able to clear those debts.

An added difficulty is that the switch from loans to bonds boosted the number of contracts. With bank loans, usually only a small number of banks are involved. Bonds, by contrast, are held directly or indirectly by thousands of retail and institutional investors, which naturally multiplies the communication challenges in case of restructuring. In the light of this, herding behavior coupled with negative externalities can cause fire sales, making PSI more difficult.

While sovereign default appears to be a pervasive problem,[10] markets still lend to countries that have defaulted or share characteristics of weak fiscal structures and weak financial systems.[11] This may be traceable to irrational exuberance, costly information acquisition by investors and initially positive feedback from investors' herding behavior, the procyclical nature of capital markets[12] as well as a constant search for yield. Governments may lack the institutional capacity to monitor the amount of inflows and the risks involved when confronted with a sudden reversal of funds. Multilateral institutions may lack the leverage to warn emerging markets of the downside risks of "hot money" flows. Bulow and Rogoff (1990) already called for legal and institutional modifications to change the composition of capital flows from debt towards foreign direct investment and other forms of equity. An SDRM would probably constitute such an institutional change. It could have the positive effect of reducing

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[9]   For a recent review of the original sin problem, see Eichengreen et al. (2003).
[10]   For an overview, see Beers and Chambers (2003).
[11]   Such countries are dubbed "debt-intolerant economies." For a discussion, see Reinhart et al. (2003).
[12]   For a review of the procyclicality of capital flows, see e.g. Kaminsky et al. (2003).

the incidence of overborrowing and debtor moral hazard, maybe changing the nature of capital flows at the expense of output losses, though.

4 The Rationale for an SDRM: Incentives and Market Failures

The current crisis resolution framework is a game of three parties, i.e. the private sector, the sovereign and the IMF. Given the absence of a clear framework for crisis resolution, both the private sector and the sovereign have a strong and shared interest in generous insurance arrangements to be provided by the third party, the IMF (Goldstein, 2001). Neither the private sector nor the sovereign has strong incentives to change the rules of the game as long as the IMF covers a major share of a potential downside risk. Both perceive the IMF to be time inconsistent[13] since its stated policies on private sector involvement, non-bailouts for sovereigns and strict enforcement of access limits have repeatedly been broken.

Nevertheless, when we take a look at the incentives of all three parties involved, it becomes clear that an SDRM would be in the interest of each one of them. For the private sector and the sovereign, it basically boils down to preserving the "going concern value" of the debt or the economy. For the IMF, an SDRM would resolve, among other problems, the time inconsistency of its current lending practice.

The private sector has a strong incentive to negotiate debt restructuring early on because of the growing share of bonds in sovereign debt and the fact that most sovereign bondhold-

ers must use the marking-to-market method. Protracted negotiations will damage the economy and lower the market value of creditors' claims. Therefore this results in a convergence of interests between a debtor and its creditors.

For the sovereign debtor the incentive structure is similar. A more orderly restructuring of a sovereign's unsustainable debt would limit the damage to the debtor's economy and improve creditors' repayment prospects. Also, if rightly designed, the mechanism would significantly enhance the incentives for both the borrowers and lenders. The risk of moral hazard for creditors would lessen as lenders would no longer expect protection against loss if the borrower encounters severe difficulties. At the same time, creditors would be better able to manage their country risks, provided the SDRM is applied early in a crisis. This may limit the depth of the needed restructuring and contain the losses incurred by creditors who, under a disorderly and protracted procedure, would be unable to withdraw their credit before the borrower's default.

The IMF would benefit from an SDRM because under present circumstances the IMF's use of its resources does not appropriately affect the debt restructuring process. In recent years the IMF faced problems where bailing out private creditors was the only alternative to triggering a financial meltdown with huge costs to the debtor country and the danger of destabilizing the international financial system via contagion. There was no way of achieving a timely debt restructuring that would have reduced the

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[13] A policy is deemed to be time inconsistent if it oscillates between clear rules and total discretion and therefore is not credible.

need for finance and adjustment. While the IMF's policy of lending into arrears has helped, it does not create sufficient room for working out an orderly debt restructuring. Hence, it is argued, an SDRM is called for as a credible alternative to choosing between large financial bailouts and the destruction of national and international prosperity.

Financial markets are often portrayed as perfect and said to lead to an optimal allocation of resources. This, though, is only correct if markets are complete and efficient. However, neither a market nor insurance for all future states of the world exists. Derivative instruments are meant to fill this gap. Yet financial markets are prone to market failure since the assets traded in them yield a return over a prolonged period. These returns depend on future states of the world and are therefore subject to uncertainties and information asymmetries. Herd behavior and externalities are endemic because individual asset values depend on collective expectations of future outcomes. Moreover, the public good of financial stability is likely to be undersupplied in the absence of conscious intervention by public authorities.

The international financial architecture must address in particular three market failures:[14] (1) information asymmetries, (2) aggregation effects and externalities and (3) the deficient supply of public goods.

(1) Complete information is necessary for market efficiency. Financial markets are by nature information based and are thus subject to information asymmetries. This gives rise to two specific problems: first, adverse selection, which basically refers to how an insider can credibly transmit private information to an outsider concerning some exogenous key characteristics of a good. Second, moral hazard, which is a product of information asymmetries where the insider can affect economic outcomes but the outsider is unable to observe or infer correctly the actions taken by the insider. This entails time inconsistency, which typically results in suboptimal outcomes relative to the full information equilibrium.

(2) Decisions by individual agents are conditional on the expectations of what others will do. The resulting uncertainty about other agents' future actions introduces costs that in principle might, but in practice often cannot, be alleviated by insurance.[15] In financial markets, the inability to enter binding conditional contracts on future states of the world means that individual agents have to protect themselves against the consequences of potential actions by others. But individual rational behavior, if simultaneously followed by a large number of agents, can produce suboptimal outcomes. Such aggregation effects lie behind the phenomena of overshooting and multiple equilibriums. Once a market movement away from an initial equilibrium is initiated, it may gather speed. A new equilibrium may not be quickly established, nor is it guaranteed that it will be socially superior to the previous equilibrium.

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[14]   *See Mas-Collel et al. (1995) for an excellent overview on market failures and references or Sachs (1995).*

[15]   *A classical example is the prisoner's dilemma.*

(3) Public goods benefit everyone but cannot easily be charged for, which is why there is a danger of undersupply. Information in itself has elements of a public good, and so has financial system stability (whose functioning also depends on a host of public goods). In the absence of an infrastructure providing for public goods, uncertainties will be greater and financial contracting will be more costly. Markets will be smaller in size and more prone to disruptions.

What are the consequences of these market failures for the international financial system?

(1) Information asymmetries tend to be quite acute in cross-border lending due to exchange and transfer risks. Sovereign immunity and the absence of international insolvency procedures further complicate matters.

(2) Externalities and aggregation effects are a major problem at the international level. Kaminsky and Reinhart (1999) have shown how a domestic banking crisis can lead to a currency crisis, which then intensifies the banking crisis and adds to its real economic costs. Traditional domestic mechanisms, such as the provision of safety nets or the existence of a lender of last resort, do not exist at the international level. The IMF performs some of these functions but it has neither the resources nor the authority to provide a fully credible protection against financial disturbances.

(3) Another factor are collective action problems, such as a "rush to exits," when creditors try to minimize their individual losses and cause a crisis that has real and avoidable costs; a "rush to courthouses" or a "grab race," when creditors start litigation and can attach assets if they move first; and the "holdout" or "rogue creditor" problem, when minority holdout creditors may wreck a restructuring that is advantageous to the majority of creditors.[16] In addition, debtors may have an incentive to default opportunistically; i.e. if defaulting is made too easy, debtors may exhibit unwillingness rather than inability to pay (Bulow, 2002).

Given the largely positive incentives for all three parties involved as well as the possibility of correcting market failures, we may observe a "tragedy of the commons" problem (Hardin, 1968). No individual party has a sufficiently strong incentive to set up this mechanism even though collectively everybody would be better off if an SDRM was established.

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[16] In game theoretic terms, this would constitute a noncooperative Nash equilibrium, which is inferior to a cooperative one.

5 SDRM Fallout: Collective Action Clauses and a Code of Good Conduct

The proposals for an SDRM induced some private creditors to act in the shadow of the draft law. In a letter sent in April 2002 to the International Monetary and Financial Committee (IMFC), the Institute for International Finance expressed its strong belief in the usefulness of collective action clauses (CACs)[17] for easing the resolution of sovereign financial crises. Basically, this was intended to forestall progress on an SDRM. This was in stark contrast to the agnosticism the idea of such clauses had met with before the IMF advanced the SDRM proposal.

The contractual approach had been on the agenda of the international financial community since it was recommended by the G-10 in its Report on the Resolution of Sovereign Liquidity Crises in 1996 (Group of Ten, 1996). However, until the start of the SDRM debate the results were disappointing. Only the United Kingdom and Canada had voluntarily introduced collective action clauses in their sovereign debt instruments. The Member States of the EU followed suit in June 2002 in an effort to lead by example. Finally, when Mexico decided to introduce CACs in an international bond, such clauses garnered support also in many emerging markets. Since then a host of emerging market countries, such as Korea, South Africa and Uruguay, have introduced CACs in their international bonds without experiencing any noticeable price effects (IMF, 2003).

The official sector saw as an advantage of this approach that it would create a universal statutory basis without necessitating an amendment of the Articles. However, it was left open how debtors and creditors could be persuaded to include such contractual provisions in their contracts. Also, since it was recognized that a legal framework was needed to organize relations between creditors and sovereign borrowers in case of payment difficulties, it would have been more straightforward to organize such a framework by law and at the international level, rather than provide legislation at the national level. The latter would force parties to agree on any such mechanism in line with specifications spelled out by national laws that would not necessarily be coordinated among jurisdictions.

Rather than negotiating a statutory approach, the Banque de France as well as the Institute for International Finance each started to develop a Code of Good Conduct. It would be part of the nonstatutory toolbox, containing a set of high-level good faith principles, which should govern the relationship between sovereigns and the private sector, and building upon the IMF's "good faith criterion," which is a building block of the IMF's lending into arrears policy.

Such a Code of Good Conduct would be based on several principles for sovereign crisis prevention and

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[17]   *CACs typically include (1) majority restructuring provisions, which enable a qualified majority of bondholders to bind all bondholders of the same issue to the financial terms of a restructuring; (2) majority enforcement provisions, which enable a qualified majority of bondholders to prevent a minority of bondholders of the same issue from accelerating their claims following a default, and to reverse an acceleration that has already occurred; and (3) trust deeds, which confer the right to initiate legal proceedings on behalf of all bondholders upon a trustee, who can act only if requested to do so by the requisite percentage of bondholders, and ensure that the proceeds of any litigation are distributed evenly among all bondholders.*

resolution and would apply to the resolution of all types of potential payment problems between a sovereign debtor and its creditors. The code would be a voluntary and nonbinding declaration of good practices already followed in the market and would be used on a case-by-case basis.

The principles spelled out in the code are designed to ensure that the process of sovereign payment problem resolution is timely, transparent, representative, expeditious and equitable among creditors, and equitable between the debtor and its creditors. The code includes, for example, provisions for ensuring an early dialogue between a sovereign debtor and its external private creditors, for achieving inter-creditor equity and for making the negotiation process predictable and transparent to reduce market uncertainty and its adverse effect on the value of claims. Moreover, it affords creditors the opportunity to contribute to the design of the restructuring agreement.

While the code is to be welcomed, it remains without muscle given its voluntary character. In particular, it can only address contentious issues, such as the size of debt relief when a country has serious solvency problems, without offering a binding solution. A case in point is the question of how large a reduction in the net present value of creditors' claims is needed. Here, a delicate balance must be struck between preserving the growth capacity of the debtor's economy – and thus its capacity to pay over time – and creditors' legitimate interests or, more precisely, rights to be repaid. Also, how much additional fiscal effort can be required from the debtor to repay its creditors even if this would reduce the debtor country's growth and per capita disposable in-

come? It is doubtful whether a voluntary arrangement can achieve such a balance without an independent arbiter.

In other words, an independent arbiter may be necessary for the following reason. By deciding to lend into arrears, the IMF considerably narrows the room for negotiations, between a debtor country and its creditors, aimed at determining how much of the country's external debt should be serviced. Granted, the IMF is obliged to make such decisions with the highest degree of impartiality, but, at the same time, it has to make sure that medium-term economic recovery prospects are not jeopardized. In determining the fiscal effort to be required from a country, the IMF must make a balanced judgment not about what is politically feasible in the debtor country but about what should be delivered. The degree to which a country can make fiscal efforts to service its external debt depends, inter alia, on its relative income per capita. Also, the IMF must be aware that by lending into arrears it is setting precedents that may influence the markets' expectations about when a country is likely to reach debt levels that the IMF considers too large for the country to service in full. And private creditors have no power to veto any such arrangement.

6 Conclusions

While academic consensus on and political support for an SDRM have waned for the time being, its discussion nevertheless has been beneficial and has produced several tangible results:
— A renewed awareness of the problem of sovereign debt and a greater focus of the IMF on operationalizing concepts, such as debt

sustainability and the balance sheet approach;
— a search for and partial implementation of intermediate solutions, such as collective action clauses;
— possible consensus between the private and official sectors on elements of a Code of Good Conduct.

Despite these positive developments, the international financial system still lacks an effective mechanism for a more orderly restructuring of the sovereign debts of countries that are unable to service their debt fully and on time. Such a regime would be in the interest of the international financial system since a disorderly default of a country with an unsustainable debt profile can impose costs that are socially inefficient and thus can hurt both debtors and creditors. The various proposals put forth by the IMF for establishing more orderly procedures have considerably advanced the understanding of how to reconcile creditors' legitimate interests with the need to preserve the economic potential of a debtor country, which is the best protection of creditors' claims.

There has also been considerable progress towards determining which procedures can best guarantee that decisions aimed at such a reconciliation of interests are balanced and fair and preserve the culture of credit. The latter is very important and possibly the main objective of the SDRM: how to ensure that emerging market countries have access to international credit at the lowest possible cost,

while preserving market discipline and thereby avoiding or minimizing creditor and debtor moral hazard. An SDRM should thus only be used when a problem cannot be resolved via voluntary or market-based approaches. It should not replace well-functioning debt restructuring procedures already in use or encourage opportunistic defaults.

History suggests that the probability of significant change in the international financial architecture is limited.[18] Proposals for reform tend to be cyclical both in terms of the sympathy evinced for such measures and the regularity with which old ideas seem to resurface – only to be rejected. Interest in ambitious reform measures typically peaks shortly after a crisis breaks and gradually recedes as the crisis begins to subside and market sentiment improves. It will probably be a long time before a statutory insolvency regime is considered an essential building block of the international financial architecture. Besides, such a future regime is likely to involve significant exemptions and opt-out clauses to start with, while nevertheless proving its worth. In the end, both the statutory and the nonstatutory approach are initiatives that propose an alternative to making the IMF a lender of last resort (Fischer, 1999). Even though opposition to a large institutional change is strong and forceful, it may only seem impossible until it happens at which point it seems foreordained (Rogoff, 1999).

[18] *Even in the sovereign context, bankruptcy procedures can be very controversial and politically divisive. As a case in point, it took at least seven attempts to introduce bankruptcy legislation in the U.S. starting in 1789 with a first proper bankruptcy procedure only enacted in 1898. See also Bolton (2003).*

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The Impact of ATM Transactions and Cashless Payments on Cash Demand in Austria

Helmut Stix

The aims of this study are twofold: to determine the levels of cash inventories held by Austrians and to examine how ATM transactions and cashless payments affect their demand for cash.

The key results of this study are based on survey data on the cash withdrawal habits of Austrians aged 14 and over. The results suggest that the cash held by this group of individuals for transaction purposes accounts for only a relatively small share of the total cash in circulation (approximately 10%). Furthermore, it can be seen that individuals who use ATMs withdraw cash more frequently and consequently hold significantly smaller amounts of cash than individuals who do not use ATMs.

The study also deals with cashless payments, which were found to have had an impact on the use of cash: the share of cash payments has fallen since 2000 (projections suggest a decline of some 6 to 7 percentage points from 2000 to 2002). This development is attributable primarily to robust growth in debit card transactions. Despite the rise in cashless payments, currently the share of cash payments (in value terms) is likely to be above 70%, so that cash remains by far the most important means of payment in Austria.

The results of this study therefore show that ATM transactions and the increased use of cashless payments have had a significant impact on cash demand in Austria and will probably continue to do so in future. Since, however, cash withdrawal and payment habits are unlikely to change overnight, this development should not have much impact on monetary policy.

1 Introduction

Although central banks keep detailed statistics on the development of monetary aggregates, owing to the anonymity of cash very little is known about individual cash demand, i.e. about who holds how much cash and for what purpose. This study aims to shed some light on this issue. Its goals are twofold: to determine the amounts of cash held by Austrians and to examine how ATM transactions and cashless payments affect their demand for cash.

From a central banking perspective, cash circulating in a monetary area that is used for transactions is of particular interest, as these holdings are directly related to economic activity and to price formation.[1] Since, however, a significant proportion of cash in circulation is hoarded, or circulates abroad, the level of transaction holdings and their development over time can be computed only indirectly on the basis of aggregate data. In addition, such estimates are made more difficult by sharp fluctuations in the stock of cash in circulation — a phenomenon which emerged around the time the euro was introduced. This study will therefore attempt to determine cash demand and its determinants not on the basis of aggregate data but by using primary statistical information derived from microdata. Most of the results are therefore based on four surveys on the cash withdrawal habits of Austrians commissioned by the OeNB from May 2003 to February 2004. These surveys provide for an up-to-date and detailed picture of cash withdrawal habits and their implications for cash holding by Austrians.

This is of particular importance when seen against the backdrop of payment practices that are currently in the throes of transformation. For instance, growth in the total value of payments at point-of-sale (POS) terminals (debit card payments) from 2000 to 2003 was some 83%. At the same time, ATM transactions continued to register modest growth. The rise in cashless payments and increased ATM use raise the question of what impact this development has

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[1] *See Fischer et al. (2004).*

on central banks from an economic perspective. For instance, it is argued that increased cash substitution could have implications for monetary policy.[2] In addition, declining cash demand reduces central banks' seigniorage revenues.[3] To evaluate the significance of such effects, the current extent of cash substitution first needs to be quantified. However, relatively few studies in the current literature are available on this subject. The results, which are largely based on empirical analyses of macroeconomic time series, indicate a negative effect of card payments on the demand for cash, whereas the results relating to the effect of ATM transactions are less conclusive.[4] In contrast, microeconomic studies point to a significantly negative impact of ATM transactions on the demand for cash. For the most part, however, these studies are based on relatively old data (Avery et al., 1986 for the U.S.A.; Boeschoten, 1992, for the Netherlands) and do not quantify the strength of the effect (Attanasio, et al., 2002 for Italy use data until 1995). For Austria, moreover, no current study is available. The focus of this study, therefore, is to examine the impact of ATM transactions and cashless payments on the demand for cash in Austria.

This study is structured as follows: First, a brief synopsis of growth in ATM withdrawals and POS (EFTPOS, electronic funds transfer at point of sale) payments will be presented in chapter 2. Chapter 3 starts with a discussion of the theoretical foundation of this study, followed by a description of the data used. In principle, ATM transactions and cashless payments can impact on cash holding in two ways. First, ATM transactions could speed up the velocity of cash in circulation. This implies that, for a given value of cash transactions, individuals hold lower average cash balances. Second, the option of cashless payments also changes the volume of transactions effected with cash, entailing changes in cash demand. This study will therefore discuss these two effects separately. First, different aspects of Austrians' cash withdrawal habits and the estimation results of a microeconomic cash demand function are analyzed (chapter 4). In a second step, the development of the share of cash payments (in value terms) in total transactions over the last few years is assessed in chapter 5. This will allow conclusions to be drawn about the change in the demand for cash caused by cashless payments. Chapter 6 concludes and summarizes the key results of this study.

2 Growth in POS Payments and ATM Transactions

Table 1 summarizes some key figures about the Austrian ATM and POS network. The total number of automated teller machines, i.e. ATMs (both ATMs outside banks and bank lobby ATMs), has grown considerably in the last few years, mainly triggered by the rise in the number of lobby

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[2] For example, Markose and Loke (2003) argue that an impact on monetary transmission is possible: In an economy with an extensive payment card network, the extent of substitution between cash or POS payments responds very sensitively to changes in interest rates. This means that situations could arise where ". . . interest rate rises (cuts) targeted at curbing (expanding) bank lending may prove to be difficult" (ibid, p. 473).

[3] Although this effect may be statically small, the discounted sum of reductions in future seigniorage revenues can be substantial.

[4] Although many studies indicate a negative effect on cash demand, others do not establish a significant correlation. For an overview of the literature, see Stix (2004).

Table 1

ATM and POS Growth Rates[1]								
	ATMs	ATMs cash withdrawals	Annual change	POS terminals	Payment transactions	Annual change	Payments	Annual change
	number	number (million)	%	number	number (million)	%	EUR billion	%
1998	4,776	91.5	×	19,240	38.8	×	2.0	×
1999	5,338	96.1	5.0	28,763	58.1	49.7	3.2	57.5
2000	5,913	101.9	6.0	40,170	80.1	37.9	4.5	43.5
2001	6,622	107.0	5.0	58,073	105.6	31.8	5.9	29.6
2002	7,028	109.6	2.4	68,939	140.9	33.4	7.6	29.0
2003	7,499	111.4	1.6	86,200	158.3	12.3	8.3	9.1

Source: Data until 2001: ECB (2003), Data from 2002 onwards: Europay Austria.
[1] The number of automated teller machines refers to the number of operable ATMs outside banks, bank lobby ATMs and cash dispensers. The number of cash withdrawals comprises all ATM withdrawals and the portion of lobby withdrawals that is made by persons who do not hold an account at that bank.

ATMs. By contrast, the number of outdoor ATMs grew at a slower pace.

The development of growth rates of ATM transactions shown in table 1 suggests a slowdown. However, since these figures include only a portion of all lobby transactions, only limited conclusions about the growth in the number of all outside ATM and lobby transactions can be drawn from the data shown in table 1.[5]

The POS network has expanded strongly. This relates to both the number of POS terminals and to the number and volume of payment transactions. Recently, however, the total transaction value has grown at a slower pace (+9%) than in previous years when annual growth of roughly 30% was registered.

At a European level (ECB, 2003), Austria has the third-densest network of ATMs (after Spain and Portugal) in terms of the number of ATMs per inhabitant. The scenario for POS terminals is quite different. With only 7.1 terminals per 1,000 inhabitants, Austria is below the EU average of some 12 terminals.

On balance, these data allow one to conclude that the number of ATM transactions – mainly due to the growth in lobby transactions – should continue to grow modestly. Although growth in POS volumes has recently slowed, this method of payment is likely to become increasingly important as the density of POS terminals increases.

3 Impact of ATM Transactions and Cashless Payments on Cash Demand

3.1 Theoretical Background

This study's conceptual and theoretical framework is based on the inventory-theoretic model of the transactions demand for cash proposed by Baumol (1952) and Tobin (1956).[6] When deciding how frequently and, equivalently, how much to withdraw, consumers take two factors into account: the cost incurred per withdrawal (possibly including the opportunity cost of the time required per withdrawal) and forgone interest. Baumol and Tobin showed that the optimal withdrawal amount is proportional to the square root of the total value of transactions and indirectly proportional to the square root of interest rates. This means that if the transaction value

[5] Transactions made by customers who withdraw money from their own bank lobby ATMs are not included. However, these transactions are likely to constitute the majority of all lobby transactions.

[6] The original model assumed that cash is the sole means of payment, that expenditures are distributed equally over time and that there is no uncertainty about expenditures.

declines by 1%, the amount withdrawn will decline by 0.5%. Since average cash holdings in this model are half the withdrawal amount, this percentage change in the withdrawal amount implies the same percentage change in average cash balances.

ATM transactions and cashless payments affect optimal cash holdings in two ways. First, ATM transactions are likely to reduce the time-cost per withdrawal.[7] In this event, consumers would withdraw cash more frequently and so hold smaller amounts of cash on average. However, it could also be that bank counter withdrawals are merely substituted by ATM transactions and that, all things considered, the number of withdrawals does not rise. The initial focus of this study is therefore the question of whether and to what extent ATM use affects withdrawal frequencies and hence the demand for cash.

Second, card payments permit direct access to the payer's account, which means that only part of total transactions is effected in cash. As shown by the literature, this decline in cash transactions has a proportional effect on optimal cash holdings (Markose and Loke, 2003). With a transaction elasticity of 0.5, for example, a 10% decline in the percentage share of cash payment yields a 5% decline in cash holdings.[8] As a result, the percentage change in the demand for cash can be estimated provided the transaction elasticity of the demand for cash and the rate of change in the share of cash payments are known. This issue is highlighted in the second part of this study.

3.2 Data Used

The results of the first part of this study are based largely on surveys commissioned by the OeNB on a quarterly basis from the second quarter of 2003 to the first quarter of 2004 and conducted by the Institute for Empirical Social Research (IFES). The target respondents in each of these individual surveys were selected from among a representative sample of 2,000 people living in Austria with a minimum age of 14 years. These four surveys are aggregated in the analysis below.

In accordance with the abovementioned theoretical model, the demand for cash is determined by the frequency of withdrawals and by the amount withdrawn. Accordingly, survey participants were asked about their usual withdrawal amount, the frequency of their cash withdrawals from ATMs and at bank counters, and their regular cash acquisition from other sources.[9] The answers regarding withdrawal frequencies are grouped into six categories ranging from "Several times a week" to "Less than once a month". Since it cannot be expected that respondents will remember how much cash they withdrew in the previous month (or their current average cash holdings), the survey question fo-

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[7]   For a theoretical model, see Attanasio et al. (2002).

[8]   That ATM transactions make it easier to access cash means these could also affect the percentage share of cash payments (Markose and Loke, 2003). This effect is not examined in the present study.

[9]   The questions are: "Roughly how frequently or at what time intervals do you draw cash from ATMs? Approximately how often do you withdraw cash from your account or savings book directly at a bank counter?" "And what amount of cash do you usually withdraw? Please give an approximate or average figure." It should be pointed out that "ATM withdrawal" (the term used here) can also include withdrawals from bank lobby ATMs. For other sources of cash acquisition, the following question was posed: "Do you personally have any other regular sources of cash — e.g. from your parents, cash disbursements from wage or all pension payments, etc.?"

cuses on typical behavior.[10] The average cash holding is then computed to be half the typical withdrawal amount plus minimum balances, the undershooting of which triggers a further cash withdrawal.[11]

The surveys are based on the subjective assessments of respondents, thus providing interesting insights into individuals' cash withdrawal behavior. However, these results can also be distorted by implausible answers. This is why cases with particularly high monthly withdrawal amounts (more than EUR 4,000) are not taken into account. Furthermore, there are respondents who did not answer parts of certain questions. Since these cases are not included in the analysis below, the sample under consideration fluctuates between 6,500 and 7,800 persons depending on the assessment.

4 Cash Withdrawal Behavior in Austria

Roughly 69% of all Austrians – or 94% of debit cardholders – use ATMs to draw cash. By contrast, only some 58% of Austrians regularly draw cash at bank counters. Moreover, 14% of respondents regularly acquire cash from other sources (e.g. from their parents, wage or pension payments). Closer examination shows that this applies particularly to young people who are on low incomes and/or in education (for instance, some 65% of all those in education and 24% of those under the age of 35 receive cash on

a regular basis). Although the surveys do not provide any information about the source of these funds, this demographic structure indicates that these payments come primarily from parents or close relatives.

An analysis of the total amount withdrawn indicates that about 53% of total cash withdrawn comes from ATMs and 37% from banks whereas the percentage share of other sources of cash acquisition is around 10%.[12] From an aggregated perspective, compensation in cash (which falls into the latter category) should already be included under ATM and bank withdrawals. For this reason, sources of cash other than ATMs or banks are not considered from table 3 onward.

4.1 Withdrawal Options Used

Table 2, which summarizes the relative percentage shares of individuals drawing cash exclusively from ATMs and those drawing cash exclusively at bank counters, provides insights into withdrawal preferences. This analysis shows that around 37% of respondents withdraw cash exclusively from ATMs, 26% exclusively at banks and 32% from both ATMs and at bank counters. 5% of respondents withdrawal cash neither from ATMs nor from bank counters. The important role played by ATMs in cash withdrawal becomes clear if a closer look is taken at debit cardholders only. About half of this group withdraws its cash exclusively from ATMs.

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[10] This approach is followed by Avery et al. (1986).

[11] Data on minimum balances are available only from the survey for the first quarter of 2004. The calculation of average cash holdings assumes that these minimum balances can be used for all four surveys (i.e. that these minimum balances remain constant from May 2003 to February 2004). If individuals have several cash sources, the average cash holding was calculated to be half the sum of typical withdrawal amounts (Boeschoten, 1992).

[12] Excluding other sources of cash acquisition, ATM transactions account for a 59% share of total withdrawals. The above-mentioned figures are based on withdrawal frequency assumptions that are described in greater detail below (section 4.2).

Table 2

Use of Withdrawal Options

		Cash withdrawal			
		exclusively		both from ATMs and bank counters	neither from ATMs nor from bank counters
		from ATMs	from bank counters		
		% of respondents			
Total		37	26	32	5
Gender	female	36	29	29	6
	male	37	23	35	4
Income	quartile 1	32	37	25	6
	quartile 2	34	31	31	3
	quartile 3	38	22	37	2
	quartile 4	44	13	41	2
Age	up to 35	47	13	33	6
	35 to 44	45	16	37	2
	45 to 54	38	21	36	4
	55 to 64	32	31	33	4
	65+	15	59	20	6
Education	compulsory school education	30	34	29	6
	senior technical school/high school	37	23	37	3
	high school graduate/college/university	52	10	35	2
Place of residence	up to 3,000 inhabitants	31	30	35	5
	from 3,000 to 5,000 inhabitants	35	29	31	4
	from 5,000 to 50,000 inhabitants	39	26	30	5
	from 50,000 to 1 million inhabitants	51	19	24	6
	more than 1 million inhabitants (Vienna)	34	25	36	5
Card ownership	debit card	50	5	44	1

Source: OeNB.

Table 2 reveals that the choice of withdrawal options varies between different demographic groups. For instance, the choice between ATM withdrawal and bank withdrawal correlates with age: whereas only 15% of respondents above the age of 65 withdraw cash exclusively from ATMs, 59% choose to withdraw exclusively at bank counters. For respondents below the age of 35, however, the picture is the reverse. In this group, 47% withdraw cash exclusively from ATMs and 13% exclusively at bank counters. Furthermore, the figures in table 2 indicate a positive correlation between income and ATM use, as well as between education and ATM use.

Furthermore, it is to be expected that ATM use also depends on sup-ply-side effects (e.g. the density of ATM and bank networks).[13] As the surveys do not provide information on this count, this association will be analyzed in terms of the size of place of residence. This accordingly shows that in small localities (less than 3,000 inhabitants) the percentage share of individuals withdrawing cash exclusively from ATMs is less than the Austrian average. By contrast, in towns of 50,000 to 1 million inhabitants this figure exceeds the Austrian average by a wide margin. Interestingly, this does not apply to Vienna where the percentage share of individuals drawing cash exclusively from ATMs is below the Austrian average. Most likely, this is attributable to Vienna's relatively dense network of bank branches.

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[13] *Another crucial factor is the withdrawal cost incurred at ATMs relative to those incurred at bank counters. Owing to a lack of data, this factor is not analyzed in the present study.*

4.2 Cash Withdrawal Frequency

As ATM or bank withdrawals vary substantially among individuals, we will analyze the frequency of cash withdrawal in a next step. Chart 1 shows a breakdown of answers on withdrawal frequencies ranging from "Less than once a month" to "Several times a week." Accordingly, 38% of individuals who use debit cards withdraw cash about once a week, 23% every two weeks and 15% several times a week. Conversely, cash withdrawals at bank counters show a different picture: here, the answers indicate that 35% of the respondents withdraw cash roughly once a month and 37% even more rarely.

Chart 1

Frequency of Withdrawal

in % of users per category

From ATMs
From bank counters

Source: OeNB.
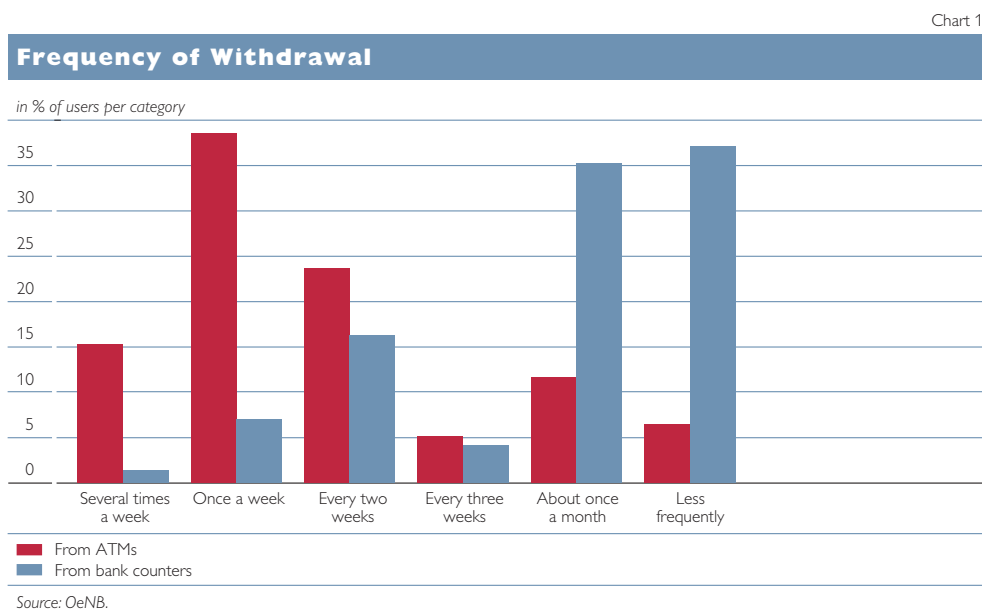
However, these figures also include individuals who use both forms of cash withdrawal. If only those respondents who draw cash exclusively from ATMs or exclusively at bank counters are considered, the surveys show that about 82% of (exclusive) ATM users withdraw cash at least every two weeks whereas the percentage share of those withdrawing cash (exclusively) at bank counters is 40%.

The qualitative data on withdrawal frequencies can be converted into quantitative values (withdrawals per month). However, to this end it is necessary to make assumptions about the frequency of use for those categories to which a definite frequency cannot be allocated. These assumptions were selected as follows: For "Several times a week", it was assumed that respondents withdraw cash twice a week. For "Less than once a month," it was assumed that they do so every second month.[14] The resulting withdrawal frequencies per month are summarized in table 3.

This shows that respondents withdraw cash some 3.4 times on average (median: 2.7 times) a month, which is equivalent to an interval of some 9 days between two withdrawals. If we take a look at ATM users and those who do not use ATMs, this shows a

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[14] It should be underlined that these assumptions influence both the velocity of cash in circulation calculated below and the estimation results. However, the qualitative results of this study are not affected.

Table 3

Number of Withdrawals and Withdrawal Amounts[1]

		Withdrawals per month		Average amount withdrawn			
				only from ATMs		only from bank counters	
		average	median	average	median	average	median
		number		EUR			
Total		3.4	2.7	166	100	412	300
Gender	female	3.2	2.2	165	100	398	300
	male	3.6	2.7	168	150	432	300
Income	quartile 1	3.1	2.2	140	100	355	300
	quartile 2	3.3	2.2	163	100	418	300
	quartile 3	3.5	2.7	173	120	485	400
	quartile 4	3.9	3.6	183	150	515	400
Age	up to 35	4.3	4.3	113	100	267	200
	35 to 44	4.0	4.3	169	150	325	200
	45 to 54	3.5	2.7	191	150	399	300
	55 to 64	2.8	2.2	215	200	453	400
	65+	1.9	1.4	262	300	464	400
Education	compulsory school education	3.0	2.2	179	150	396	300
	senior technical school/ high school	3.6	2.7	158	100	456	300
	high school graduate/ college/university	4.2	4.3	151	100	462	300
Card use	uses ATMs	4.0	4.3	×	×	×	×
	uses only ATMs	3.8	4.3	×	×	×	×
	withdraws only from counters	1.8	1.0	×	×	×	×
	uses both	4.3	4.3	×	×	×	×

Source: OeNB.
[1] The sample comprises only individuals who acquire cash only from ATMs and bank counters.

frequency of use of 4 and 1.8 times per month respectively (median: 4.3 withdrawals versus 1 withdrawal). This means that on average ATM users draw cash approximately twice as frequently as non-ATM users. The group comprising individuals who use both options has the highest withdrawal frequency (4.3 times a month). Once again, demographic differences can be seen, with younger people withdrawing cash more frequently than the elderly and persons in higher income categories withdrawing cash more frequently than those in lower income categories.

As mentioned before, only a limited number of comparable studies are currently available. For instance, Attanasio et al. (2002) find that Italians used their debit cards to withdraw cash 4.2 times a month in 1995. For the Netherlands, Boeschoten (1992) finds that individuals withdrawing cash

primarily via ATMs in 1990 had a monthly withdrawal frequency of 3.9. In general, Boeschoten finds that this group withdrew cash approximately 35% more frequently (and cash amounts were some 35% smaller per withdrawal) than that not withdrawing at ATMs. Older data going back to 1986 for the U.S.A. (Avery et al., 1986) yield a similar value of 4.3 withdrawals per month for individuals who usually withdrew cash primarily via ATMs. The relevant comparable figures for Austria are 4 (see Attanasio et al., 2002) and 4.16 withdrawals per month (see the last two studies cited). In view of the fact that it is difficult to compare payment systems of different countries and that interest rate levels differed (the level of interest rates influences the frequency of cash withdrawal), the results for Austria may be considered comparable.

4.3 Withdrawal Amounts

Average withdrawal amounts for respondents who made withdrawals exclusively from ATMs or exclusively at bank counters are also summarized in table 3. As expected, the roughly twice-as-high withdrawal frequency found among ATM-only users is reflected in the level of the withdrawal amount, which is some EUR 166 per cash withdrawal. Individuals who do not use debit cards draw EUR 412 on average. Since the survey questions about withdrawal amounts refer to typical regular behavior, the use of the median amount appears to be more appropriate. This is EUR 100 for ATM-only users whereas the median for bank counter withdrawals is EUR 300. It can therefore be seen that ATM transactions result in a significantly higher withdrawal frequency and in lower amounts withdrawn.

4.4 Average Cash Holding

The results for average cash balances (based on respondents' answers) are summarized in table 4.

Table 4

Average Cash Balances[1]		Average	Median
		EUR	
Total		215	155
Gender	female	202	155
	male	230	155
Income	quartile 1	175	115
	quartile 2	211	155
	quartile 3	231	180
	quartile 4	254	185
Age	up to 35	143	90
	35 to 44	208	130
	45 to 54	230	180
	55 tp 64	255	200
	65+	281	230
Education	compulsory school education	217	175
	senior technical school/high school	233	155
	high school graduate/college/university	196	115
Place of residence	up to 3,000 inhabitants	216	155
	from 3,000 to 5,000 inhabitants	225	155
	from 5,000 to 50,000 inhabitants	206	155
	from 50,000 to 1 million inhabitants	189	130
	more than 1 million inhabitants (Vienna)	242	165
Card use	pays with debit card less than once a month	246	180
	pays with debit card at least once a month	191	115
	uses ATMs	202	130
	uses only ATMs	116	78
	draws cash only from counter	252	180
	uses both forms	312	230

Source: OeNB.

[1] Average cash balances were calculated on the basis of data on the typical withdrawal amount and include minimum cash balances, the undershooting of which triggers a further cash withdrawal. Since data on minimum balances are only available from the February 2004 survey, it was assumed that the average value of the minimum holding is the same for each population group as that of February 2004. The sample comprises only individuals who acquire cash only from ATMs and bank counters.

The table shows that individuals hold an average of EUR 215. Thus, for all Austrians aged 14 years and over, the survey results imply cash holdings of some EUR 1.3 billion. This is roughly equivalent to a share of 10% of the cash in circulation prior to the introduction of the euro.[15] If

[15] As data on national banknote circulation are no longer available since the euro's introduction, we use cash in circulation at the end of 2000 as a reference.

these results are not statistically distorted, they imply that only a relatively small share of cash in circulation is actually used for transactions. This tallies with results of Boeschoten (1992) for the Netherlands and with those of Paunonen and Jyrkönen (2002) for Finland, who report similar values.[16] In contrast, Fischer et al. (2004) estimate that the share of the transactions demand for cash in euro-area member states' cash in circulation is likely to range between 25% and 40%. If one considers first that the estimate of 10% for Austria reflects only regular withdrawal behavior and, second, that cash holdings of business enterprises and of respondents below the age of 14 are not covered, the share of the transactions demand for cash in total currency in circulation could be at the lower end of the estimate calculated by Fischer et al. (2004).[17] This implies that most of the cash in circulation is either being hoarded and/or being held abroad.

In addition to the expected effects (arising from the previous discussion) on the average cash holding of ATM users, table 4 also shows that, for individuals who make at least one cashless payment per month at a debit card POS terminal, the average cash holding is 23% lower than for that of the relevant comparable group. Furthermore, cash holdings correlate positively with income and age, as they do, to some extent, negatively with the level of education.

From a monetary perspective, the velocity of cash in circulation is of interest. This is defined as total cash expenditures divided by average cash holdings over a certain period of time (in this instance, a month). A higher velocity of circulation means that each euro in circulation enables cash transactions of a correspondingly higher value. In this sense, the velocity of cash in circulation measures the efficiency of cash as a means of payment.

The velocity of cash in circulation thus calculated implies that cash circulates 3.4 times per month, or approximately 41 times a year.[18] Considerable differences within the population are also evident here. For instance, the velocity of cash in circulation for ATM users is 3.8 whereas it is around 2.8 for individuals who withdraw cash exclusively at banks.

Taken together, the results found thus far indicate that the use of ATMs is associated with higher frequencies of withdrawal and thus with lower cash holdings. Moreover, there appear to be differences in the cash holdings depending on sociodemographic characteristics (e.g. age, income and education). However, since the total value of transactions differ between the population groups, definitive conclusions about the effects of these characteristics on cash holdings cannot be drawn from the purely descriptive presentation. The estimation results of multivariate cash demand functions are therefore discussed next.

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[16]   Paunonen and Jyrkönen (2002) estimate that about 11% to 12% of Finnish cash in circulation is used by households for transactions. Boeschoten (1992) estimates a share of some 12% for the Dutch population as a whole.

[17]   According to unpublished estimates calculated by the OeNB around the time at which the euro was introduced, business enterprises are likely to hold some 8% to 9% of total cash in circulation. To this amount one has to add the cash holdings of those under the age of 14 as well as the sum of cash lost or unaccounted for.

[18]   The velocity of cash in circulation reported here does not relate to the average velocity of circulation but to its aggregated equivalent (total expenditure divided by total average cash holdings). Furthermore, it is assumed that cash will actually be spent, not hoarded or repaid into a savings book or account.

4.5 Impact of ATM Use on Cash Demand

To calculate the impact of ATM use on cash demand, average cash holdings are regressed on the monthly volume of cash transactions. The regression equations also include sociodemographic variables. A positive coefficient means that, given a certain transaction volume, average cash holdings are bigger, or conversely, that cash is withdrawn less frequently.[19]

The results presented in table 5 only cover individuals who draw cash either exclusively from ATMs or exclusively at banks. Since many survey participants do not have a personal income or have not declared this, two specifications (in each case, including and excluding income) are estimated. In each of these two specifications, the coefficient of the "ATM use" dummy variable measures the percentage change in cash holdings if a person uses an ATM.

Table 5

Estimation Results[1]

	Dependent Variable: Log(Average Cash Holding)			
	Specification 1		Specification 2 (with personal income)	
Constant	0.902***	(0.087)	0.349**	(0.171)
Log(amount withdrawn)	0.552***	(0.012)	0.560***	(0.015)
Age	0.012***	(0.001)	0.012***	(0.001)
Head of household	−0.027	(0.025)	−0.050*	(0.029)
Size of family	0.009	(0.019)	0.011	(0.023)
Men	−0.001	(0.022)	−0.021	(0.025)
Secondary education	−0.034	(0.023)	−0.062**	(0.027)
Higher education	−0.087***	(0.023)	−0.118***	(0.030)
City	0.083	(0.066)	0.029	(0.063)
Small town	0.107*	(0.059)	0.044	(0.058)
Medium-sized town	0.140**	(0.065)	0.094	(0.063)
Large town	0.059	(0.063)	0.036	(0.056)
In education	−0.234***	(0.053)	−0.065	(0.110)
Jobless	−0.079	(0.048)	−0.062	(0.055)
Retired	−0.001	(0.033)	0.027	(0.039)
Household worker	0.050	(0.036)	0.139**	(0.069)
Agricultural worker	0.228***	(0.072)	0.331***	(0.116)
Business enterprise owner	0.115*	(0.060)	0.086	(0.080)
Log(income)			0.086***	(0.025)
ATM usage	−0.573***	(0.023)	−0.594***	(0.028)
R²	0.58		0.58	
Observations	4,361		2,994	

Source: OeNB.

[1] *OLS estimates, robust standard errors in parentheses. *** (**) [*] denote the significance at 1% (5%) [10%]. The dependent variable was calculated survey responses. The sample includes individuals who withdraw cash exclusively from ATMs or exclusively from banks. The results of time dummies and region dummies are not shown.*

Irrespective of the specification, the results show that, at the same transaction value, ATM users hold considerably less cash. The point estimates imply that individuals who draw cash exclusively from ATMs have cash holdings that are on average around 42% lower than those of individuals who draw cash exclusively at banks.

The results for the transaction elasticity indicate the presence of economies of scale: a 1% increase in the volume of cash transactions results in an approximately 0.6% increase in

[19]   *This specification is similar to that of Boeschoten (1992). Since tests have shown that there is no sample selectivity, the equations were estimated using ordinary least squares (OLS). As data on minimum balances are only available for the last survey, the dependent variable was calculated excluding minimum balances.*

cash holdings, with the point estimates found to be within the theoretically predicted range.[20] Furthermore, the estimation results confirm the previous assumption that cash holdings increase significantly with age. The coefficients of the other variables indicate the effect of the opportunity cost of time: for instance, individuals with higher education who presumably have a higher opportunity cost of time (compensation per hour worked) hold some 8% less cash than people with less education. The coefficients of dummy variables, measuring the employment effect, can also be interpreted in this way.[21] For instance, individuals in education have cash holdings that are 21% lower than those held by employed persons. By contrast, individuals employed in agriculture and owners of small business enterprises have cash holdings that are 26% and 12% higher respectively than those of individuals in other types of employment.

In the second specification, only individuals disposing of their own income are considered, as a result of which the number of observations is far smaller. The significantly positive coefficient for the level of income again indicates the effect of the time-cost per withdrawal. Individuals on higher incomes incur a higher cost per withdrawal because of the opportunity cost of time and so, for the same transaction amount, draw cash less frequently than individuals on lower incomes. Although in this specification, the effect of other sociodemographic variables is essentially the same, the significance of some of the

results changes. For instance, it can be seen that owners of small business enterprises do not hold significantly higher amounts of cash. By contrast, the effect of those in household employment is significantly positive. Furthermore, individuals with secondary education also have lower cash holdings than those with less school education.

Taken together, the results indicate that only a small number of sociodemographic characteristics have an impact on cash holding. These are essentially likely to be age, education and income. Moreover, ATM use has a quantitatively significant impact on the demand for cash. This is likely to be because the time-cost per ATM withdrawal is lower, which means that cash is drawn more frequently on the whole. This helps to economize on cash balances. If the frequency of ATM use changes, a significant impact on the demand for cash can be expected accordingly.

5 Decline in Cash Usage and Cash Demand Owing to Growth in POS Payments

A further significant effect on cash holdings can be caused by cashless payments. Since the last few years have seen a steep rise in payments via POS terminals, it would be interesting to assess the extent to which this development has affected both the use of cash and the demand for cash by households. This chapter therefore presents such an assessment.

Just as for cash holdings, there is not much direct evidence on the use

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[20] In various different expansions of the Baumol-Tobin model, the transaction elasticity can range between one-third and two-thirds.

[21] The dummy variables in education, pensions, household employment, agricultural employment and owners of small business enterprises measure the effect relative to other individuals in employment.

Table 6

Growth in Cash Share of Transactions Amount

	Share in value of transactions 2000	Growth rate		Projected payment shares		Projected change
		2000 to 2002	2000 to 2003	Assumption: private consumption growth[1] 2002	Assumption: growth in retail sales[1] 2002	
	%					percentage points
Cash	81,5	×	×	76,1 to 76,7	75,1 to 75,6	−6,4 to −4,8
Check	2,9	−23	×	0,0	0,0	−2,9
ATM card	11,1	67	83	17,6	18,4	6,5 to 7,3
Credit card	2,6	35	×	3,4	3,5	0,7 to 0,9
Loyalty card	1,9	×	×	1,9 to 2,4	1,9 to 2,5	0,0 to 0,6
Quick card	0,1	772	668	0,5	0,5	0,4

Source: for 2000 shares: Mooslechner et al. (2002); for growth in volumes: Europay Austria and OeNB.

[1] The 2002 cash payment shares are projected on the basis of the assumed growth in total payments (total payments grow either in line with private consumption, 5.5%, or in line with retail sales excluding motor vehicles, 1.5%) and on the basis of the assumed growth of loyalty card and check payments. The shares thus calculated are an approximate projection.

of different payment methods. Indirect evidence drawn from survey data must therefore be relied on. The OeNB, for instance, conducted surveys in 1996 and 2000 on the use of various payment methods by Austrian households (Mooslechner and Wehinger, 1997; Mooslechner et al., 2002). According to these surveys, debit card payments rose sharply from 2.5% to 11.5% of total payments from 1996 to 2000 whereas the percentage share of check payments and that of credit card payments suffered a steep and a modest decline respectively. Cash payments fell from 84.4% to 81.5% of total payments (in value terms).

The evolution of payment methods since 2000 are summarized in table 6. These data are based on figures published in the Blue Book of the European Central Bank (ECB), which are available only until 2002. Figures for 2003 are currently available only for debit card and Quick payments.

The percentage shares of different payment methods computed from the 2000 survey can be used in conjunction with data on the growth in the different types of payments to extrapolate the current percentage shares of different payment methods for 2002 and 2003. This is based on the consideration that the share of cash payments follows residually from the rise in total transaction value and from the growth in the value of cashless payments. In practice, however, it should be qualified that such a calculation only allows for a rough estimate. There are several reasons for this. First, the shares computed for 2000 are based on survey results which themselves have a certain range of fluctuation. Second, the growth in payment method turnover must be known. However, the growth rates (cited in table 6) of check transactions are likely to reflect primarily check payments by business enterprises.[22] Likewise, data from the Blue Book do not provide any insights into the growth of loyalty cards. Several

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[22] Although data are not available, checks, since the lapse of the check guarantee, are increasingly likely to play only a marginal role in the payment habits of households. For instance, only some 0.8 check transactions (including checks written by business enterprises) per inhabitant per year were made in 2002 (ECB, 2003).

scenarios about the assumed trends of these two payment methods are therefore analyzed below.[23] Third, this calculation requires an estimated growth rate of the total transaction value, i.e. all the cash and noncash private purchases and payments of Austrians. Although these are not directly available, they can be roughly estimated by nominal private consumption growth and retail sales growth.[24]

The payment shares for 2002 arising from these considerations are summarized in table 6. As is apparent, the share of cash payments – depending on the assumed growth rate of total transactions – posted a decline of between 5 and 6 percentage points. In absolute terms, the share of cash payments in 2002 is likely to have been between 75% and 77%. With a share of 18%, debit card payments registered the steepest rise. The more-than-sevenfold increase in Quick payments led to a rise in the share of Quick payments to some 0.5%. Since debit card payments grew by 9% between 2002 and 2003, an attempt was also made to project the payment shares for 2003. This projection shows that the share of cash transactions at the end of 2003 is likely to have been in the range of 74% to 75%. However, since data on credit card transaction values are not yet available for 2003, this estimate is less reliable than that for 2002.

Despite the caution required in interpreting these results, some trends are nevertheless evident. First, although the share of cash payments is declining, at the end of 2003 it is still likely to have been well in excess of 70%.[25] Second, the decline in the use of cash can be attributed primarily to the growth in debit card payments. Third, conclusions about the change in the transactions demand for cash can be drawn from the increase in cashless payments.[26] Here simulations show that nominal cash expenditures were declining from 2000 to 2002. At a rough estimate, the rate of change per assumed scenario is between –1% and –7%. Since the transaction elasticity estimated in section 4.5 should range between 0.5 and 0.6, this trend implies a decline in cash demand of some –0.5% to –4%.

6 Summary and Conclusions

This study has examined the impact of ATM transactions and cashless payments on the demand for cash. In addition, it has analyzed the cash withdrawal behavior of Austrians, and, in particular, the impact of ATM transactions on cash balances. Owing to the substantial growth in POS payments, this study also examined the impact of this development on the use of cash. A feature shared by both these aspects is that the analysis is not based

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[23] *It is assumed that the percentage share of check payments has declined to zero. By contrast, it is assumed that the transaction value of loyalty cards will grow either in line with credit card transactions or total transactions.*

[24] *It is assumed implicitly that there were no significant shifts from payment methods that were not included in the survey of 2000 (e.g. payment slips) to payments methods that were included.*

[25] *Should check payments by households still account for a notable share, then the cash share would fall by about the check share. As it can be assumed that the check share has definitely not increased since 2002, the share of cash payments should not be less than 70%.*

[26] *Normally, nominal cash demand rises with nominal transactions growth. If, however, the increase in cashless payments outstrips the nominal growth of all (cash and noncash) transactions, the nominal value of cash transactions can decline.*

on aggregate time series data but on survey data.

The findings on the cash withdrawal behavior of Austrians indicate that cash held by Austrians aged 14 and over for transaction purposes accounts for only a relatively small share of total cash in circulation (approximately 10%). Furthermore, it was found that increased ATM use has significant and substantial effects on the demand for cash. For instance, the regression results show that individuals who withdraw cash exclusively from ATMs hold cash inventories that are on average 42% lower than those who do not use ATMs. The results based on a rough estimate of the share of cash payments show that cash in 2002 probably accounted for a share (in value terms) of between 75% and 77%. Compared with 2000, this means the share of cash payments registered a decline of some 6 to 7 percentage points, primarily due to the robust growth in debit card payments.

The results of this study therefore indicate that ATM transactions and the increased use of cashless payments had a significant impact on the demand for cash in Austria and will probably continue to do so in future. This is to be expected, first of all since the number of ATM and lobby transactions contin-

ues to grow in Austria. Furthermore, younger people use ATMs more frequently than the elderly. If younger people do not change their habits in the future, this would likewise imply a future rise in the number of ATM transactions. Second, Austria ranks among those countries in Europe with a high share of cash payments, a relatively low density of POS terminals and a low frequency of POS payments. By contrast, it is estimated that the share of cash payments in countries such as Finland or France, where cashless payments are very frequent, is around 60% (Snellman et al., 2001). The decline in Austria's share of cash payments can therefore be interpreted as a development which puts Austria in line with other countries which have made greater progress down this road.

As far as ATM use and cashless payments are concerned, some countries in the euro area are at the same stage of development as Austria. The results of this study therefore imply that, for the euro area as a whole, the transaction demand for cash will also be affected by ATM transactions and cashless payments. However, since cash withdrawal and payments behavior will not change overnight, this development is unlikely to have an impact on monetary policy.

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Abbreviations

ACH	automated clearing house	GNP	gross national product
APSS	Austrian Payment System Services GmbH	GSA	GELDSERVICE AUSTRIA Logistik für Wert-gestionierung und Transportkoordination GmbH (Austrian cash services company)
ARTIS	Austrian Real Time Interbank Settlement (the Austrian RTGS system)	HICP	Harmonized Index of Consumer Prices
A-SIT	Secure Information Technology Center – Austria	IBAN	International Bank Account Number
ASVG	Allgemeines Sozialversicherungsgesetz – General Social Security Act	IBRD	International Bank for Reconstruction and Development
A-Trust	A-Trust Gesellschaft für Sicherheitssysteme im elektronischen Datenverkehr GmbH	IDB	Inter-American Development Bank
ATM	automated teller machine	IFES	Institut für empirische Sozialforschung GesmbH (Institute for Empirical Social Research, Vienna)
ATX	Austrian Traded Index	ifo	ifo Institute for Economic Research, Munich
BCBS	Basel Committee on Banking Supervision (BIS)	IGC	Intergovernmental Conference (EU)
BIC	Bank Identifier Code	IHS	Institut für Höhere Studien und Wissenschaftliche Forschung – Institute for Advanced Studies, Vienna
BIS	Bank for International Settlements	IIF	Institute of International Finance
BOP	balance of payments	IIP	international investment position
BSC	Banking Supervision Committee (ESCB)	IMF	International Monetary Fund
CACs	collective action clauses	IRB	internal ratings-based
CEBS	Committee of European Banking Supervisors (EU)	ISO	International Organization for Standardization
CEE	Central and Eastern Europe	IWI	Industriewissenschaftliches Institut – Austrian Institute for Industrial Research
CEECs	Central and Eastern European countries	IT	information technology
CESR	Committee of European Securities Regulators	JVI	Joint Vienna Institute
CIS	Commonwealth of Independent States	LIBOR	London Interbank Offered Rate
CPI	consumer price index	M3	broad monetary aggregate M3
EBA	Euro Banking Association	MFI	monetary financial institution
EBRD	European Bank for Reconstruction and Development	MRO	main refinancing operation
EC	European Community	MÖAG	Münze Österreich AG – Austrian Mint
ECB	European Central Bank	MoU	memorandum of understanding
Ecofin	Council of Economic and Finance Ministers (EU)	NCB	national central bank
EEA	European Economic Area	ÖBB	Österreichische Bundesbahnen – Austrian Federal Railways
EFC	Economic and Financial Committee (EU)	OeBS	Oesterreichische Banknoten- und Sicherheitsdruck GmbH – Austrian Banknote and Security Printing Works
EIB	European Investment Bank		
EMS	European Monetary System		
EMU	Economic and Monetary Union	OECD	Organisation for Economic Co-operation and Development
EONIA	Euro OverNight Index Average		
ERM II	Exchange Rate Mechanism II (EU)	OeKB	Oesterreichische Kontrollbank (Austria's main financial and information service provider for the export industry and the capital market)
ERP	European Recovery Program		
ESA	European System of Accounts		
ESAF	Enhanced Structural Adjustment Facility (IMF)	OeNB	Oesterreichische Nationalbank (Austria's central bank)
ESCB	European System of Central Banks		
ESRI	Economic and Social Research Institute	OPEC	Organization of the Petroleum Exporting Countries
EU	European Union	ORF	Österreichischer Rundfunk – Austrian Broadcasting Corporation
EURIBOR	Euro Interbank Offered Rate		
Eurostat	Statistical Office of the European Communities	ÖBFA	Austrian Federal Financing Agency
FATF	Financial Action Task Force on Money Laundering	ÖNACE	Austrian Statistical Classification of Economic Activities
Fed	Federal Reserve System		
FFF	Forschungsförderungsfonds für die Gewerbliche Wirtschaft – Austrian Industrial Research Promotion Fund	PE-ACH	pan-European automated clearing house
		PISA	Programme for International Student Assessment (OECD)
FMA	Financial Market Authority (for Austria)	POS	point of sale
FOMC	Federal Open Market Committee (U.S.A.)	PRGF	Poverty Reduction and Growth Facility (IMF)
FSAP	Financial Sector Assessment Program (IMF)	RTGS	Real-Time Gross Settlement
FWF	Fonds zur Förderung der wirtschaftlichen Forschung – Austrian Science Fund	SDR	Special Drawing Right (IMF)
		SDRM	Sovereign Debt Restructuring Mechanism (IMF)
GAB	General Arrangements to Borrow	SEPA	Single Euro Payments Area
GATS	General Agreement on Trade in Services		
GDP	gross domestic product		

SPF	Survey of Professional Forecasters	UNO	United Nations Organization
STEP2	Straight-Through Euro Processing system offered by the Euro Banking Association	VaR	Value at Risk
		WBI	Wiener Börse Index
STP	straight-through processing	WEF	World Economic Forum
STUZZA	Studiengesellschaft für Zusammenarbeit im Zahlungsverkehr G.m.b.H. – Austrian Research Association for Payment Cooperation	WIFO	Österreichisches Institut für Wirtschaftsforschung – Austrian Institute of Economic Research
S.W.I.F.T.	Society for Worldwide Interbank Financial Telecommunication	WIIW	Wiener Institut für internationale Wirtschaftsvergleiche – The Vienna Institute for International Economic Studies
TARGET	Trans-European Automated Real-time Gross settlement Express Transfer	WKO	Wirtschaftskammer Österreich – Austrian Federal Economic Chamber
Treaty	refers to the Treaty establishing the European Community	WTO	World Trade Organization
UNCTAD	United Nations Conference on Trade and Development		

Legend

- = The numerical value is zero
.. = Data not available at the reporting date
× = For technical reasons no data can be indicated
0 = A quantity which is smaller than half of the unit indicated
∅ = Mean value
_ = New series

Note: Apparent arithmetical discrepancies in the tables are due to rounding.

Irrevocable euro conversion rate: EUR 1 = ATS 13.7603.

List of Studies Published
in Monetary Policy & the Economy[1]

www.oenb.at/press service/oenb publications

Issue Q1/04

Subdued Economic Activity in the Euro Area and Austria Despite
International Recovery
Gerhard Fenz, Thomas Gruber, Wolfgang Pointner

Determinants of Long-Term Growth in Austria — A Call for a
National Growth Strategy
Ernest Gnan, Jürgen Janger, Johann Scharler

Inflation Differentials in Europe: Past Experience and
Future Prospects
Balász Égert, Doris Ritzberger-Grünwald, Maria Antoinette Silgoner

The International Financial Architecture: Official Proposals on
Crisis Resolution and the Role of the Private Sector
Christian Just

The Impact of ATM Transactions and Cashless Payments on
Cash Demand in Austria
Helmut Stix

[27] *Monetary Policy & the Economy replaces Focus on Austria (for a list of reports, summaries and studies published up to December 2003, see Focus on Austria 4/2003).*

Periodical Publications
of the Oesterreichische Nationalbank

Focus on Statistics   monthly

The monthly statistical bulletin, published in German as *Statistisches Monatsheft,* comprises approximately 200 tables covering macroeconomic, financial and monetary indicators as well as explanatory notes. An English version called *Focus on Statistics* is published on the Internet only (www.oenb.at). As from July 2004, the monthly statistical bulletin will be replaced by the quarterly publication *Statistiken – Daten und Analysen.*

www.oenb.at/statistics

Statistiken – Daten und Analysen   quarterly

This publication contains reports and analyses about Austrian financial institutions as well as about macroeconomic indicators related to financial flows and stocks based primarily on OeNB statistics. The contributions are in German, with English-language executive summaries of the reports. The analyses are also summarized in English. Tables are available in English on the OeNB's website. This publication is scheduled to replace the monthly statistical bulletin, published in German as *Statistisches Monatsheft,* as of July 2004.

Monetary Policy & the Economy   quarterly

This quarterly publication, issued both in German and English, is dedicated to analyses of cyclical developments, medium-term macroeconomic forecasts, studies on central banking and economic policy topics as well as research findings from macroeconomic workshops and conferences organized by the OeNB.

www.oenb.at/press service/oenb publications

Financial Stability Report   semiannual

The *Financial Stability Report,* issued both in German and English, contains two parts: the first part reports on international developments relating fo financial stability and on the financial market in Austria (e.g. institutions, stock market, bond market). The second part deals with special financial stability issues.

www.oenb.at/press service/oenb publications

Focus on Transition   semiannual

The *Focus on Transition* contains a wide range of material on Central and Eastern European countries (CEECs), beginning with a topical economic analysis of selected CEECs. The main part of the publication comprises studies, on occasion several studies focusing on a special topic. The final section provides information about the OeNB's CEEC-related activities and conferences as well as a statistical annex.

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Annual Report — annual

The *Annual Report* of the OeNB provides a broad review of Austrian monetary policy, economic conditions, new developments on the financial markets in general and the financial market supervision in particular, the changing responsibilities of the OeNB and the role of the OeNB as an international partner in cooperation and dialogue. It also contains the financial statements of the OeNB.

www.oenb.at/press service/oenb publications

Economics Conference (Conference Proceedings) — annual

The *Economics Conference* hosted by the OeNB represents an important international platform for exchanging views on monetary and economic policy as well as financial market issues. It convenes central bank representatives, economic policy decision makers, financial market players, academics and researchers. The conference proceedings comprise all papers, most of them in English.

www.oenb.at/press service/conferences

East-West Conference Proceedings — annual

This series, published by Edward Elgar, reflects presentations made at an annual OeNB conference on topics that are related to Central, Eastern and Southeastern Europe and the ongoing EU enlargement process and that are relevant from a central banker's view.

www.oenb.at/press service/conferences

The Austrian Financial Markets — annual

The publication provides easy access to continuously updated information on the Austrian capital markets to the international investment community. The brochure is jointly edited by the OeNB and the Oesterreichische Kontrollbank AG (OeKB).

www.oenb.at/press service/oenb publications

Workshop Series — recurrent

The issues of the launched in 2004 *Workshop Series* comprise papers presented at OeNB workshops at which national and international experts, including politicians, economists, researchers and journalists, discuss monetary and economic policy issues. Workshop proceedings are available in English only.

www.oenb.at/press service/conferences

Working Papers — recurrent

The *Working Paper* series of the OeNB is designed to disseminate and provide a platform for discussion of work of OeNB economists or outside contributors on topics which are of special interest to the OeNB. To ensure the high quality of their content, the contributions are subjected to an international refereeing process. The opinions are strictly those of the authors and in no way commit the OeNB.

www.oenb.at/press service/oenb publications

HVW-Newsletter **quarterly**

The English-language *Newsletter* is only published on the Internet and informs an international readership about selected findings, research topics and activities of the Economic Analysis and Research Section of the OeNB. This publication addresses colleagues from other central banks or international institutions, economic policy researchers, decision makers and anyone with an interest in macroeconomics. Furthermore, the Newsletter offers information on publications, studies or working papers as well as events (conferences, lectures and workshops).

www.oenb.at/newsletter

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