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# ANALYSES

# Global Recovery and Stable Domestic Economic Conditions Support Moderate Upswing

## Economic Outlook for Austria from 2004 to 2006 (Spring 2004)

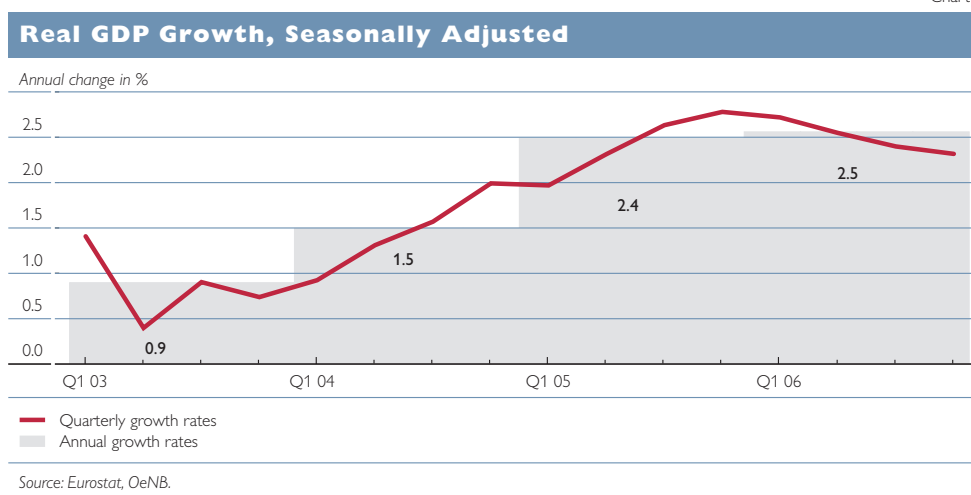
Gerhard Fenz,  
Johann Scharler,  
Martin Schneider

### I Summary

According to the spring 2004 economic outlook of the Oesterreichische Nationalbank (OeNB), Austria's real gross domestic product (GDP) is projected to increase by 1.5% in 2004. Economic growth is expected

to accelerate to 2.4% in 2005 and to 2.5% in 2006. Inflation as measured by the Harmonised Index of Consumer Prices (HICP) will be 1.7% in 2004, driven to some extent by increased oil prices, and 1.5% and 1.6% in the subsequent years.

Chart 1



In 2003, the Austrian economy grew by 0.9% (seasonally and working-day adjusted).<sup>1</sup> This growth is attributable to strong domestic demand in the first half of the year. Investment in particular grew at a fast pace in early 2003. Demand for investment was fueled by a need for replacement investment, favorable financing conditions and the investment tax credit.

Despite a relatively small increase in disposable income and tight labor market conditions, consumer demand proved to be quite robust in the first half of 2003. According to preliminary national accounts data, Austria – contrary to the euro area – will experience an economic slowdown in the second half of 2003. However, these data are generally prone to major revisions. If future data releases in the second half of the year confirm sluggish growth, expectations for the

2004 growth rate will have to be revised downwards.

Sluggish global economic growth and the appreciation of the euro caused exports to nearly stagnate in 2003. While reduced price competitiveness, induced by the appreciation of the euro, will cause Austrian exporters to lose some of their market share in 2004, the dynamic recovery of the world economy should offset this trend and noticeably stimulate Austrian foreign trade already at the beginning of 2004. Against this background, export growth is expected to accelerate in 2005 and 2006. Stepped-up domestic demand will also fuel a rise in imports. Consequently, the contribution of net exports to GDP growth will be negative (–0.2%) in 2004. As of 2005, the contribution of net exports to GDP is expected to be slightly positive.

<sup>1</sup> Not seasonally and working-day adjusted the economic growth in Austria in 2003 was 0.7% (source: Eurostat).

Table 1

**OeNB Spring Fall Outlook for 2004 – Key Results**

	2003	2004	2005	2006
<i>Annual change in % (real)</i>				
<b>Economic activity</b>				
Gross domestic product	+0.9	+1.5	+2.4	+2.5
Private consumption	+1.4	+1.4	+2.1	+2.1
Government consumption	+0.7	+0.5	+0.3	+0.3
Gross fixed capital formation	+4.4	+3.3	+4.2	+4.7
Exports of goods and services	+0.8	+4.0	+6.4	+7.5
Imports of goods and services	+2.5	+4.5	+6.5	+7.4
<i>% of nominal GDP</i>				
Current account balance	-0.9	-1.2	-1.1	-0.9
<i>Percentage points</i>				
<b>Contribution to real GDP growth</b>				
Private consumption	+0.8	+0.8	+1.2	+1.2
Government consumption	+0.1	+0.1	+0.1	+0.0
Gross fixed capital formation	+1.0	+0.8	+1.0	+1.1
Domestic demand (excl. changes in inventories)	+1.9	+1.6	+2.2	+2.3
Net exports	-0.8	-0.2	+0.1	+0.2
Changes in inventories (incl. statistical discrepancy)	-0.2	+0.1	+0.2	+0.0
<i>Annual change in %</i>				
<b>Prices</b>				
Harmonised Index of Consumer Prices (HICP)	+1.3	+1.7	+1.5	+1.6
Private consumption expenditure (PCE) deflator	+1.5	+1.6	+1.6	+1.7
Deflator des Bruttoinlandsprodukts	+1.5	+1.5	+1.4	+1.6
GDP deflator	+1.7	+0.8	+0.7	+1.0
Compensation per employee (at current prices)	+2.4	+2.1	+2.5	+2.7
Productivity (whole economy)	+0.7	+1.2	+1.8	+1.6
Compensation per employee (at 1995 prices)	+0.8	+0.4	+0.9	+1.1
Import prices	-0.8	+0.3	+0.7	+0.6
Export prices	-0.1	+0.1	+0.6	+0.8
Terms of Trade	+0.7	-0.2	-0.1	+0.2
<b>Income and savings<sup>1</sup></b>				
Real disposable household income	+1.0	+1.0	+2.4	+2.2
<i>% of nominal disposable household income</i>				
Saving ratio	7.9	7.7	8.1	8.3
<i>Annual change in %</i>				
<b>Labor market</b>				
Payroll employment	+0.3	+0.3	+0.7	+1.0
<i>%</i>				
Unemployment rate (Eurostat definition)	4.4	4.5	4.4	4.1
<i>% of nominal GDP</i>				
<b>Budget</b>				
Budget balance (Maastricht definition)	-1.3	-1.4	-1.9	-1.7
Government debt	65.4	64.8	64.0	63.0

Source: 2003: Eurostat, Statistics Austria, 2004 to 2006: OeNB spring 2004 outlook.

<sup>1</sup> 2003: OeNB estimate.

In view of lackluster employment growth, moderate wage settlements and rising inflation, real household disposable income is set to rise at a very subdued rate in 2004, despite the effects of the first stage of the tax reform. Therefore, consumer spending is not expected to accelerate

in 2004. The second stage of the tax reform, however, will bring about a substantial relief for households in 2005, which will boost both consumption growth and the saving ratio.

Labor market conditions are not expected to brighten before 2005. In 2004, total employment will grow at

a rate of 0.2%, as it did in 2003. Payroll employment will expand by a slightly higher 0.3%. Labor supply will expand relatively robustly over the entire forecast horizon. Several structural factors such as the increase in marginal employment, the rising number of foreign workers and the greater labor force participation of mature workers will contribute to this growth. The unemployment rate (Eurostat definition) will therefore keep increasing slightly to 4.5% in 2004. In 2005, employment growth will still not have enough momentum to noticeably reduce the unemployment rate. Unemployment is not expected to decline until 2006.

After recording a surplus of 0.2% of GDP in 2002, the current account switched into deficit in 2003 but can, with a shortfall of -0.9%, still be considered close to balance. This small deficit was mainly induced by the balance of trade, which will continue to determine current account developments over the forecast horizon. The income and transfer accounts are expected to remain unchanged. The current account balance in 2004, 2005 and 2006 is expected to be -1.2%, -1.1% and -0.9%, respectively.

After recording an increase of 1.3% in the HICP in 2003, the OeNB expects inflation to rise to 1.7% in 2004. Inflation is set to quicken in the wake of the surge in oil prices since spring 2003, which has only partially been offset by exchange rate developments. The rise in energy taxes effective from January 1, 2004, will contribute 0.16 percentage point to total inflation in 2004. Prices are not expected to be subject to wage or demand pressures in 2004 and 2005. Inflation is projected to edge down to 1.5% in 2005, in line with assumed sinking oil prices. The output gap is

presumed to close at the beginning of 2006 and to subsequently turn slightly positive. The ensuing cost and price pressures will push inflation insignificantly higher (1.6%) in 2006.

The budget balance (Maastricht definition) for 2004 is projected to be -1.4% of GDP, after coming to -1.3% in 2003. Due to the effects of the tax reform, the budget balance is forecast to deteriorate to -1.9% and -1.7% of GDP in 2005 and 2006, respectively, despite improved economic conditions.

## 2 Technical Assumptions

The OeNB compiled this forecast as its input for the Eurosystem's spring 2004 staff projections for macroeconomic trends in the euro area.

The forecast horizon ranges from the first quarter of 2004 to the fourth quarter of 2006. May 17, 2004, was the cutoff date for the underlying assumptions on global economic trends and for the technical assumptions on interest rates, exchange rates and crude oil prices.

The OeNB used its macroeconomic quarterly model to prepare the projections for Austria.

This forecast is based on the assumption that the monetary policy framework will remain unchanged. It therefore presupposes constant levels of both short-term nominal interest rates and the nominal effective exchange rate of the euro (euro area index) over the entire forecast horizon. The underlying short-term interest rate (three-month EURIBOR) is based on the two-week average prior to May 5, 2004. Long-term interest rates, which are in tune with market expectations for ten-year government bonds, are set at 4.27% (2004), 4.39% (2005) and 4.47% (2006). A constant rate of USD/EUR 1.189 is assumed



for future USD/EUR exchange rate trends. Taking exchange rate values to date into account, we arrive at an average rate for 2004 of USD/EUR 1.205. In the current year, the euro is thus expected to appreciate by 6.5% year on year relative to the U.S. dollar. The euro is forecast to appreciate less against other currencies on average. The nominal effective exchange rate used for the euro area projection is 1.7% higher in 2004 than it was in 2003. For the period of 2004 to 2006, we assume oil prices of USD 34.6, USD 31.8 and USD 29.2 per barrel of Brent in each successive year. The projected future trend in crude oil prices is based on futures prices. Oil prices in 2004 are USD 8.5 higher (+32%) than in the fall 2003 outlook.

### 3 Favorable International Environment

#### 3.1 Global recovery gathering strength

The recovery of the global economy is gaining pace. Expectations on the extent of the global recovery have been revised upwards since the OeNB's fall 2003 outlook. In the second half of 2003, the world economy outside the euro area experienced 5.0% year-on-year growth, while the fall outlook had projected a growth rate of 4.1%. Expectations of fall 2003 for the first quarter of 2004 have been exceeded as well. The driving forces behind the expansion are the U.S.A. and Asia, currently the most dynamic regions in the global economy. While the U.S. upswing is fueled by domestic demand, Asian economies owe their economic boom not only to domestic demand, but also to net exports.

The U.S.A. is experiencing robust economic growth. Real GDP growth

is expected to reach 4.6% in 2004. In the subsequent years, growth is projected to lessen somewhat (2005: 3.6%, 2006: 3.0%), as the expansionary monetary policy is expected to phase out and the high budget deficit renders a continued loose fiscal policy unlikely. Currently, growth in the U.S.A. is chiefly driven by consumer and capital spending. The dynamic development of consumption is mainly attributable to the surge in disposable incomes, which was triggered by tax reductions. Employment should continue to expand, which will lead to a robust growth of real disposable income. This will enable private households to maintain their consumption levels and, at the same time, boost their saving ratio. Investment in plant and equipment has gathered great momentum. Vigorous demand and historically low financing costs coupled with fiscal incentives are expected to add further to investment growth this year. In 2005 and 2006, investment growth will be dampened by declining aggregate demand and higher interest rates. Net exports will not contribute significantly to growth. The U.S. current account deficit will remain at approximately 5% of GDP until the end of the forecast horizon.

In *Japan*, economic recovery is expected to continue. The effects of implemented structural reforms and subsiding deflationary trends will strengthen domestic demand. In 2004, real growth is projected to accelerate to 3.4% on the back of animated growth in the fourth quarter of 2003 and in the first quarter of 2004. Currently all demand components are making a positive contribution to growth. Private consumption will be bolstered by improved labor market conditions, while investment will benefit from reduced corporate indebted-

ness. In 2005 and 2006, however, growth might slow down marginally. Nevertheless, 2005 and 2006 are still presumed to be years of cyclical expansion for the Japanese economy. Asia excluding Japan will remain the fastest-growing economic area in 2004, which is mainly attributable to the boom in China.

In the *United Kingdom* current data show further consolidation of the economic upswing. In the first quarter of 2004, real GDP progressed by 0.6% (seasonally adjusted and quarter on quarter). The real estate market has remained stable. Solid growth of private consumption is expected to continue. The projected rise in inflation could have a downward effect on consumption expenditure towards the end of the forecast horizon. According to survey data, investment activity will experience a substantial boost in 2004. The expected surge in export demand will more than offset the dampening effect of the appreciation of the pound sterling on exports. Overall, economic growth from 2004 to 2006 will average approximately 3%.

In *Switzerland*, economic output dropped to 0.5% in 2003. Recent national accounts data show a return to positive growth rates in the second half of 2003. Survey data indicate further acceleration at the beginning of 2004. Given its close ties with the euro area, the Swiss economy will subsequently mirror euro area developments. The recovery will be driven by low inflation rates, expected improvements on the labor market and rising demand on Swiss export markets.

The average growth rate of the new *EU Member States (excluding Cyprus and Malta)* in 2003 amounted to 3.5% and was thus substantially

above the average growth rate in the euro area (0.5%). Growth even accelerated by 1.0 percentage point year on year. The economic outlook is consistently positive. The cyclical patterns of the new Member States, which are small open economies, are strongly determined by euro area developments. As the new Member States are currently in the process of catching up, their economic growth will substantially exceed average growth in the euro area over the entire forecast horizon. A considerable degree of uncertainty stems from the effects of consolidation measures on domestic demand and future trends on the foreign exchange markets.

*Poland* experienced a strong acceleration of growth in 2003. With the depreciation of the Polish zloty, domestic demand recovered and exports picked up immensely. Domestic demand is expected to advance further over the forecast horizon, whereas the impact of net exports on growth will gradually diminish. Investment activity will be stimulated additionally through tax measures. Average growth of real GDP from 2004 to 2006 will amount to almost 5%.

The growth rates of the *Czech Republic* and *Hungary* over the forecast horizon will be slightly lower at 3% and 4%. In *Hungary* fiscal policies introduced to stimulate the economy in 2003 were ineffective because imports rose. The expected economic upswing – driven by increased export demand and restored business confidence – will be fairly moderate. High interest rates and necessary consolidation measures in the government sector will dampen domestic demand.

In the *Czech Republic*, private consumption and in particular increased investment activity fueled an accelera-

tion of economic growth in 2003. Consolidation measures will depress private consumption growth somewhat in 2004 compared to 2003. Moreover, as the negative contribution of net exports to growth is projected to diminish, economic growth will remain at the 2003 level of 3.0%. Towards the end of the forecast horizon economic growth will accelerate to almost 4%.

### 3.2 Recovery in the euro area slowly gaining ground

The recovery in the euro area is slowly feeding through to all demand aggregates. Nevertheless, it still has little momentum compared to other regions. In the second half of 2003, domestic demand was lackluster and growth was mainly propelled by exports. There are, however, indications that domestic demand will rebound. Since the last quarter of 2003, investment growth has been positive again.

Real GDP growth in the first quarter of 2004, which was very strong (0.6%) according to preliminary estimates, was mainly driven by domestic demand. This forecast does, however, not expect this dynamic growth to hold throughout the rest of 2004.

Despite the deterioration of price competitiveness caused by the appreciation of the euro, exports play an important role in the recovery. In 2004, investment activity is presumed to pick up again. 2005 and 2006 will see a further expansion of investment activity due to accelerator effects. Private consumption will gather momentum amid the recovery, as disposable household incomes will resume stronger growth. The labor market outlook remains subdued for the time being. Employment is not expected to make much headway until 2005.

Germany may post signs of a moderate improvement of the economic situation, but the upturn is still very

Table 2

#### Underlying Global Economic Conditions

	2003	2004	2005	2006
<i>Annual change in % (real)</i>				
<b>Gross domestic product</b>				
World GDP growth outside the euro area	+4.5	+5.3	+4.9	+4.8
U.S.A.	+3.1	+4.6	+3.6	+3.0
Japan	+2.7	+3.4	+2.1	+2.3
Asia excluding Japan	+7.2	+7.3	+6.4	+6.6
Latin America	+1.2	+3.6	+4.8	+4.7
United Kingdom	+2.2	+3.1	+2.9	+2.8
New EU Member States	+3.5	+4.2	+4.6	+4.7
Schweiz	-0.5	+1.6	+2.3	+2.2
Euro area <sup>1</sup>	0.5	1.4–2.0	1.7–2.7	x
<b>World trade</b>				
Imports of goods and services World economy	+5.4	+7.2	+7.6	+7.7
Non-euro area countries	+7.1	+8.2	+7.9	+7.7
Real growth of euro-area export markets	+5.8	+7.8	+8.0	+7.8
Real growth of Austria's export markets	+3.7	+6.1	+7.2	+7.6
<b>Prices</b>				
Oil price (in USD/barrel of Brent)	28.9	34.6	31.8	29.2
Three-month interest rate in %	2.3	2.1	2.1	2.1
Long-term interest rate in %	4.1	4.3	4.4	4.5
USD/EUR exchange rate	1.131	1.205	1.189	1.189
Nominal effective exchange rate (euro area index)	99.91	101.65	100.89	100.89

Source: ECB.

<sup>1</sup> Results of Eurosystem's spring 2004 projections. The ECB presents the results in ranges based upon average differences between actual outcomes and previous projections.

subdued. Currently, exports are the main contributor to growth, while domestic demand has not shown any indications of an upward trend. In view of the three-year slump in investment activity, there seems to be an increasing need for replacement investment. However, the investment cycle has apparently not gathered steam yet. Prospects for investment and private consumption chiefly depend on a stabilization of business and consumer confidence.

The most recent survey data for *France* indicate a stimulation of domestic demand. The most likely scenario is therefore a consolidation of the recovery. In *Italy* domestic demand developed surprisingly well in the first quarter of 2004. Nevertheless, it is the worldwide economic recovery that will constitute the driving force behind the projected Italian upswing.

#### 4 Austrian Exports Benefit from Growth in World Trade

This forecast is based on the assumption of strong world trade growth, primarily powerful trade growth in

the U.S.A. and in Asia (excluding Japan). However, economic growth in Germany, Italy and Switzerland, all of which are important trade partners to Austria, will only be moderate. At the same time, the new EU Member States will provide a fast-growing target market for Austrian exports.

In 2003, Austrian exporters felt the negative effects of the unfavorable external trade environment. Euro exchange rate movements in tandem with the sluggish euro area economy led to near-stagnation (+0.8%) of Austrian real exports of goods and services in 2003. After declining in the first half of 2003, however, Austria's exports recovered in the second half, as was the case in the other euro area countries. Export growth is expected to reach 4.0% in 2004. As in 2003, however, price competition will entail a market share loss of over 2%. Although exports are expected to rise by 6.4% in 2005 and 7.5% in 2006, imports will grow commensurately with exports and domestic demand in 2004 and will even accelerate in 2005. Therefore, the contribution of

Table 3

Growth and Price Developments, Austrian External Trade					
	2002	2003	2004	2005	2006
Annual change in %					
<b>Exports</b>					
Competitors' prices in Austria's export markets	-2.5	-6.7	-1.4	+1.4	+1.2
Export deflator	-0.6	-0.1	+0.1	+0.6	+0.8
Changes in price competitiveness	-0.6	-5.9	-1.7	+0.8	+0.6
Import demand in Austria's export markets (real)	+0.7	+3.7	+6.1	+7.2	+7.6
Austrian exports of goods and services (real)	+4.0	+0.8	+4.0	+6.4	+7.5
Market share	+3.3	-2.9	-2.1	-0.9	-0.1
<b>Imports</b>					
International competitors' prices in the Austrian market	-1.1	-4.3	-1.1	+1.1	+1.1
Import deflator	-2.0	-0.8	+0.3	+0.7	+0.6
Austrian imports of goods and services (real)	+1.7	+2.5	+4.5	+6.5	+7.4
<b>Terms of trade</b>	+1.3	+0.7	-0.2	-0.1	+0.2
Percentage points					
<b>Contribution of net exports to GDP growth</b>	+1.2	-0.8	-0.2	+0.1	+0.2

Source: 2002 to 2003: Eurostat, 2004 to 2006: OeNB spring 2004 outlook, Eurosystem.

Table 4

**Austria's Current Account**

	2002	2003	2004	2005	2006
	% of nominal GDP				
<b>Balance of trade</b>	2.0	1.1	0.8	0.8	1.0
Balance on goods	1.7	0.7	0.6	0.7	0.8
Balance on services	0.3	0.4	0.1	0.2	0.2
Euro area	-3.6	-4.7	-4.8	-4.7	-4.6
Non-euro area countries	5.6	5.8	5.5	5.5	5.6
<b>Balance on income</b>	-1.0	-1.1	-1.1	-1.1	-1.1
<b>Balance on current transfers</b>	-0.8	-0.9	-0.9	-0.9	-0.9
<b>Current account</b>	0.2	-0.9	-1.2	-1.1	-0.9

Source: 2002 to 2003: OeNB, 2004 to 2006: OeNB spring 2004 outlook.

net exports to GDP growth will follow a fairly balanced trend over the forecast period.

In 2002 as well as 2003, Austria's current account balance remained within  $\pm 1\%$  of GDP; thus the current account can be described as in balance. The slight surplus in 2002 (+0.2% of GDP) resulted from decreasing imports due to sluggish domestic demand, whereas the deficit in 2003 can be attributed to relatively strong growth in imports coupled with a weak export performance. On the basis of projected trade flows, Austria's trade surplus will shrink slightly in 2004.

The two components of the trade balance, goods and services, have followed opposing trends since the early 1990s. While the services surplus has diminished steadily, the goods account has shown continuous improvement (with the exception of 2003). This trend is expected to continue in a milder form over the forecast horizon. The geographical composition of Austria's trade balance, which is characterized by a negative balance with euro area countries and a sizeable surplus with countries outside the euro area, is not expected to change between now and 2006.

As in 2002, the income subaccount posted a shortfall, which came

to  $-1.1\%$  of nominal GDP in 2003. The direct investments made in Austria in recent years are yielding increasing returns and thus offsetting the earnings growth of Austrian direct investments in Central and Eastern European economies. For the overall income subaccount (income from direct investments, from portfolio investments and from other investments), a stable balance equaling,  $-1.1\%$  of GDP is projected for the years 2004 and 2005. The current transfers balance – which is mainly influenced by EU transactions – will remain constant at  $-0.9\%$  of GDP over the forecast horizon. The overall current account balance will thus follow the development of the trade balance and amount to some  $-1\%$  of GDP.

## 5 Rise in Inflation to be Determined by Energy Component in 2004

The year 2003 saw a sharp drop in inflation in the first half of the year, followed by a slight increase in the second half. In 2004 to date, inflation has augmented further to 1.5% (measured as the increase in the HICP), with the service sector showing especially pronounced price rises. As early as the second quarter of 2004, inflation is projected to quicken to 1.8%, a development which can

mainly be attributed to the energy subcomponent. Therefore, the projected overall increase in the HICP is 1.7% for 2004. The energy tax hike as of January 1, 2004, in the course of Austria's tax reform measures will contribute 0.16 percentage point to inflation over the year.

Assuming an oil price of USD 34.6 per barrel (Brent) in 2004, the energy subcomponent of the HICP is projected to surge by 4.4%. The futures prices from May 17, 2004, indicate that a steady decline in oil prices can be expected starting in the second quarter of 2004. The energy subcomponent's contribution to the overall

HICP inflation will thus fall from 0.30 percentage point in 2004 to 0.15 and -0.02 percentage point in 2005 and 2006, respectively. Prices are not expected to be subject to either wage or demand pressure, since further wage moderation has been assumed and the output gap will widen slightly.

In 2005, lower inflation in energy prices will cause the inflation rate to decline to 1.5%. The output gap is likely to be closed in early 2006, after which it will become positive. The resulting cost and price pressure will lead to a slightly higher rate of inflation (1.6%) in 2006.

Table 5

### Price and Cost Indicators for Austria

	2003	2004	2005	2006
	<i>Annual change in %</i>			
Harmonised Index of Consumer Prices (HICP)	+1.3	+1.7	+1.5	+1.6
HICP energy	+1.0	+4.4	+2.1	-0.3
HICP excl. energy	+1.3	+1.5	+1.5	+1.8
Private consumption expenditure (PCE) deflator	+1.5	+1.6	+1.6	+1.7
Investment deflator	+1.4	+1.5	+1.4	+1.5
Import deflator	-0.8	+0.3	+0.7	+0.6
Export deflator	-0.1	+0.1	+0.6	+0.8
Terms of trade	+0.7	-0.2	-0.1	+0.2
GDP deflator	+1.5	+1.5	+1.4	+1.6
Unit labor costs	+1.7	+0.8	+0.7	+1.0
Compensation per employee	+2.4	+2.1	+2.5	+2.7
Labor productivity	+0.7	+1.2	+1.8	+1.6
Collectively agreed wage settlements	+2.2	+2.0	+2.3	+2.4
Profit margins <sup>1</sup>	-0.2	+0.7	+0.7	+0.5

Source: 2003: Eurostat, Statistics Austria, 2004 to 2006: OeNB spring 2004 outlook.

<sup>1</sup> GDP deflator divided by unit labor costs.

In 2003, the strength of the euro resulted in heightened price competition for exporters in euro area countries, a development which caused Austrian export prices to drop 0.1%. However, the import deflator dropped more sharply (-0.8%) than the export deflator. Sustained competitive pressure will prevent Austrian exporters from raising their prices considerably in 2004. In 2005 and 2006, however, external trade prices are expected to pick up more quickly.

Austria's terms of trade will not show any substantial changes between now and 2006.

As employment growth follows economic recovery with a time lag, productivity growth (real GDP per employee) is expected to improve in 2004 and 2005. However, employment growth will gain momentum in 2006, which will weaken productivity growth slightly. In 2003, businesses were forced to accept shrinking profit margins. From 2004 to 2006, how-

ever, corporate profit margins are expected to rebound, as unit wage costs will not keep pace with the GDP deflator due to the cyclical acceleration of labor productivity growth.

Wage settlements saw an increase of 2.2% in 2003, a year marked by high one-off payments to employees in the federal government and in manufacturing. Wage settlements in 2004 (+2.0%) will also be based on the principle of wage moderation. In 2005 and 2006, higher wage settlements are in the cards in view of the anticipated recovery of the Austrian economy. Payments in excess of the minimum wage will also rise in the wake of economic recovery.

## 6 Austrian Domestic Economy Set to Strengthen in 2004

### 6.1 Relief on the Labor Market and Tax Reforms to Boost Incomes in 2005

In 2003, household expenditure was affected by weak growth in real dispos-

able incomes (+1.0%), which rose 0.8 percentage point less than in the previous year. Austrian consumer spending expanded by 1.4%, which was stable considering the state of the economy, but could only be financed by a decrease in the saving ratio. The extraordinarily low level of interest rates appears to have brought about a shift from consumption to residential construction investments in 2003. Financial accounts data show an increase of 5.3% in housing development loans in 2003, while consumer loans fell by 1.3%. This trend was mainly observed in the second half of 2003 and may help to explain the contradiction between greater consumer confidence and simultaneously decreasing consumption growth in 2003. The confidence indicators published by the European Commission suggest that consumption growth will stabilize in 2004. Consumer confidence has now stabilized just below the level recorded in the second half of 2003, and retail confidence has improved markedly.

Table 6

#### Determinants of Nominal Household Income in Austria

	2003	2004	2005	2006
<i>Annual change in %</i>				
Compensation of employees	+2.6	+2.3	+3.2	+3.8
Employees	-0.3	+0.3	+0.7	+1.0
Wages per employee	+2.4	+2.1	+2.5	+2.7
Mixed income (net) of the self-employed and property income	+2.2	+3.9	+5.5	+6.0
Net transfers minus direct taxes <sup>1</sup>	-2.0	-3.1	-2.4	-7.8
<i>Contribution to disposable household income in percentage points</i>				
Compensation of employees	+2.2	+1.9	+2.7	+3.1
Mixed income (net) of the self-employed and property income	+0.7	+1.2	+1.7	+1.9
Net transfers minus direct taxes <sup>1</sup>	-0.3	-0.4	-0.3	-1.1
Disposable household income (nominal)	+2.6	+2.7	+4.0	+3.9

Source: 2003: Statistics Austria, 2004 to 2006: OeNB spring 2004 outlook.

<sup>1</sup> Negative values indicate an increase in (negative) net transfers minus direct taxes, positive values indicate a decrease.

Due to the tight situation on the Austrian labor market, employment as well as employee compensation will only grow marginally in 2004. Therefore, real disposable incomes are also projected to edge up by just 1.0% in

2004. This means that Austrian households will have to cut their saving ratio marginally to maintain stable consumption growth (+1.4%). Starting in 2005, the second stage of Austria's tax reform will provide private house-

Table 7

Private Consumption in Austria				
	2003	2004	2005	2006
	Annual change in %			
Disposable household income (nominal)	+2.6	+2.7	+4.0	+3.9
Private consumption deflator	+1.5	+1.6	+1.6	+1.7
Disposable household income (real)	+1.0	+1.0	+2.4	+2.2
Private consumption (real)	+1.4	+1.4	+2.1	+2.1
	% of nominal disposable household income			
Saving ratio <sup>1</sup>	7.9	7.7	8.1	8.3

Source: 2003: Eurostat, 2004 to 2006: OeNB spring2004 outlook.

<sup>1</sup> Saving ratio (forecast from 2003).

holds with tax relief amounting to just over EUR 1 billion per year. In conjunction with economic recovery, this will lead to heady growth in household incomes in 2005, which will in turn boost consumption growth to 2.1% and enlarge the saving ratio by 0.4 percentage point.

### 6.2 Investment Backlog and Favorable Financing Conditions Boost Investment Activity

After two years of decline, investment activity surged at the beginning of 2003. The investment ratio (investments as a percentage of GDP) jumped from 21.8% in the fourth quarter of 2002 to 23.0% in the first quarter of 2003. However, this value still falls considerably below the high of 24.2% reached in the first quarter of 1998 as well as being below the overall average since 1995 (23.3%). During the remaining months of 2003, no marked additional increases in investment activity were recorded. On the whole, gross fixed capital formation rose by 4.4% in 2003. Investment activity is expected to pick up steadily from early 2004 onward. Favorable financing conditions, the extension of the investment tax credit and government sector investments in transport infrastructure will contribute to additional growth in investment activity. The robust

increase of 4.4% seen in 2003 is not likely to be matched in 2004; however, the projected rise by 3.3% still signals stable investment activity. Financial accelerators are expected to boost investment activity to 4.2% in 2005 and 4.7% in 2006.

In 2005, the reduction of the corporate tax rate in the second stage of Austrian tax reform will make Austria a more attractive location for foreign investors. However, this is not expected to have a marked effect on investment activity in the short term.

After six years of decline, residential construction investment finally began to climb in 2003 (by 1.7% in real terms), and this positive growth is expected to continue. The results of the survey of lending business conducted in the first quarter of 2004 show that demand for residential construction loans increased substantially in that period. In 2004, residential construction investment is expected to expand by 1.3% and to accelerate further to 2.3% and 2.5% in 2005 and 2006, respectively.

Inventory changes (including statistical discrepancy) will make a mildly positive contribution to GDP growth in 2004 and 2005, as businesses will begin to build up inventories again during the economic upswing.



### 6.3 Strong Growth in Labor Supply to Prevent Noticeable Decrease in Unemployment until 2006

In 2003, the Austrian labor market saw a slight increase in employment (0.2%) with simultaneously rising unemployment. Easier access to the labor market for non-EU citizens (since early 2003) and the pension reforms of the year 2000 have expanded Austria's labor supply by 0.4%. This development will continue in 2004, as unemployment will continue to mount despite modest growth in employment. In early 2004, positive signals were seen in the number of reported vacancies, which advanced in April 2004 for

the third consecutive time. This figure has traditionally been a sound leading indicator for employment trends.

In 2005, employment growth will increase to 0.6% in the wake of economic recovery; however, the rate of unemployment will only decrease by 0.1 percentage point to 4.4%. The OeNB does not expect a noticeable reduction in the unemployment rate until 2006, when it is projected to drop to 4.1%.

Government-sector employment will continue to diminish in the coming years. The number of self-employed will stagnate in 2004, while a slight gain is projected for 2005 and 2006.

Table 8

#### Labor Market Developments in Austria

	2003	2004	2005	2006
	Annual change in %			
<b>Total employment</b>	+0.2	+0.2	+0.6	+0.8
<i>thereof:</i>				
Payroll employment	+0.3	+0.3	+0.7	+1.0
Self-employed	-0.1	+0.0	+0.1	+0.1
Public sector employment	-0.3	-0.3	-0.5	-0.8
Registered unemployment	+4.0	+2.2	-1.7	-3.7
Labor supply	+0.4	+0.3	+0.5	+0.6
	%			
<b>Unemployment rate (Eurostat definition)</b>	4.4	4.5	4.4	4.1

Source: 2003: Eurostat, 2004 to 2006: OeNB spring 2004 outlook.

Austria's labor supply is expected to build over the entire forecast horizon. An increase of 0.3% is projected for 2004, and the figure is expected to continue rising in 2005 and 2006. This can be attributed in part to the fact that compared to other countries Austria's labor supply reacts more sensitively to the economy. In addition, various structural factors also contribute to labor supply growth. These factors include increases in marginal employment, the rising number of non-EU citizens gaining access to the labor market and the stepped-up labor force partic-

ipation of mature workers resulting from the pension reforms of 2000 and 2003.

## 7 Sustained Uncertainty in Forecasts Due to Oil Price Trends

This forecast presents the most likely scenario for economic development in Austria (until 2006) from the OeNB's perspective. The projected consolidation of the economic upswing in 2004 is essentially based on improvements in international economic conditions and a recovery of domestic demand. However, this fore-

cast is still characterized by a high degree of uncertainty, with risks primarily linked to developments in the international economic environment. Stalwart growth in the U.S.A. and higher than expected growth in the euro area in the first quarter of 2004 indicate that economic recovery could be stronger than anticipated. However, the recent jump in oil prices could also slow down global economic recovery and push up inflation rates. This forecast assumes a gradual decline in oil prices from USD 34.6 per barrel (Brent) in 2004 to USD 29.2 per barrel in 2006. The OeNB's macroeconomic model was also applied with a view to quantifying the effects of a constant oil price of USD 40 per barrel (Brent) over the entire forecast horizon. In this alternative scenario, the real GDP growth rate would be 0.03 percentage point lower than the baseline solution in 2004 and 0.19 percentage point lower in both 2005 and 2006. HICP inflation would increase by 0.11, 0.39 and 0.28 percentage point in 2004, 2005 and 2006, respectively. Another risk factor can be found in the currently stagnant consumer confidence. Consumer spending growth could suffer if consumer confidence deteriorates.

For the year 2004, there is a fairly large downside risk based on growth patterns in 2003. A number of reasons support the idea that in the second half of 2003 growth was actually stronger than reported in quarterly SNA figures. For example, euro area growth considerably outpaced growth in Austria. The clear improvement in confidence indicators points to more animated growth in the second half of 2003, as does the statistical discrepancy between the output and expenditure sides of GDP in the second half of that year. If data published or revised

in the future confirms weak growth in the second half of 2003, however, this will compromise growth development in 2004 (see annex 1).

For 2006, a slight downside risk can be seen in investments, as by then they will have shown heady growth for the fourth consecutive year. Although financial accelerators suggest that this will be the case, the investment ratio would rise to a new high of 24.4% of GDP.

## **8 Growth Forecasts Practically Unchanged Compared to Fall 2003 Outlook**

The international economic environment has not changed significantly since the OeNB published its fall outlook in 2003. As expected, the fall of 2003 was marked by export-driven recovery in euro area countries. However, imports in euro area countries showed even more dynamic development. This will in turn lead to slightly stronger growth in Austrian export markets in 2004. For 2005, on the other hand, growth in these export markets is projected to undershoot the assumption in the fall outlook. The most important change since the publication of the OeNB's fall 2003 outlook is related to oil prices, which are significantly higher than assumed in that outlook. Both short-term and long-term interest rates have remained almost unchanged since the fall 2003 outlook. The U.S. dollar has also appreciated against the euro, whereas the nominal effective euro exchange rate has hardly changed.

Table 9 shows a breakdown of the reasons for these forecast revisions, which are explained by the impact of new data, the effects of changing external assumptions and other effects. In the case of GDP growth, the impact

of new data includes their influence as well as the influence of data revisions for 2003 on the carry-over effect<sup>2</sup>, thus also on annual growth in 2004. The data available on the first few months of 2004 are included in the HICP as well. The effects of new

external assumptions were simulated using the OeNB's macroeconomic model. The item "Other" comprises various assumptions regarding the development of domestic variables (such as government consumption) as well as changes in assessments.

Table 9

### Breakdown of Forecast Revisions

	GDP		HICP	
	2004	2005	2004	2005
	<i>Annual change in %</i>			
<b>Spring 2004 outlook</b>	+1.5	+2.4	+1.7	+1.5
<b>Fall 2003 outlook</b>	+1.6	+2.5	+1.6	+1.5
<b>Difference</b>	-0.1	-0.1	+0.1	+0.0
<b>Due to:</b>				
New data <sup>1</sup>	-0.3	-	-0.1	-
External assumptions	-0.1	-0.2	+0.3	+0.1
Other <sup>2</sup>	+0.3	+0.1	-0.1	-0.1

Source: OeNB spring 2004 and fall 2003 outlooks.

<sup>1</sup> Effect of new and revised historic data for 2003.

<sup>2</sup> Different assumptions about trends in domestic variables such as wages, government consumption, effects of measures designed to support the economy, other rating changes and model changes.

The forecast for real GDP growth in 2004 has been revised slightly downward (from 1.6% to 1.5%). This change can be put down to revised historical growth rates and the availability of new data on the year 2003. As the new data indicate that growth in the year 2003 was heavily concentrated on the beginning of the year, the carry-over effect for growth in 2004 is substantially lower (see chart 2). Changes in external assumptions have likewise had a mildly negative effect on growth projections. Against this backdrop, the OeNB's marginal downward revision of the growth outlook for the year 2004 reflects an explicit correction of this implausible growth pattern in 2003.

For the year 2005, the GDP growth forecast was also revised downward by 0.1 percentage point. The dampening effects of the interna-

tional economic environment (-0.2 percentage point) are offset in part by the expected impact of Austria's tax reforms. The composition of GDP growth has also changed. In comparison to the fall 2003 outlook, higher consumption growth is expected in 2005, a development which can primarily be attributed to Austria's tax reforms. Investment growth, on the other hand, will be flatter due to the unexpectedly powerful advance in early 2003.

The inflation outlook has been revised slightly upward for 2004, and for 2005 it remains at the level indicated in the fall 2003 outlook. In the year 2004, the values reported to date have been lower than those projected in the fall 2003 outlook. For the remaining months of 2004 and for 2005, higher oil prices will lead to marginally higher inflation.

<sup>2</sup> The carry-over effect is a measure for the influence of growth in the individual periods of the previous year on growth in a given year. It is equivalent to the percentage difference between the levels of corresponding variables in the final period of the previous year divided by the annual average of the previous year.

### 8.1 Comparison with Other Forecasts for Austria

The current forecasts of other national and international institutions for real GDP growth in 2004 range from 1.4% to 2.1%. Thus the OeNB is near the low end of this range with its projection of 1.5%. This can be attributed to our relatively cautious estimate of consumer spending (based on tepid employment growth) and to private households' increased propensity to save due to pension reforms in

recent years. Another reason can be found in the somewhat lower projected contribution of net exports to growth. Turning to HICP inflation rates, the other institutions projections range from 1.2% to 1.4% for 2004. The OeNB's higher estimate (1.7%) is probably due to newer historical data, including the recent oil price hike. No significant differences can be seen in the various forecasts for the year 2005.

Table 10

Comparison of Current Economic Forecasts for Austria													
Indicator	OeNB May 2004			WIFO April 2004		IHS April 2004		OECD May 2004		IMF April 2004		European Commission April 2004	
	2004	2005	2006	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005
<i>Annual change in %</i>													
<b>Key results</b>													
GDP (real)	+1.5	+2.4	+2.5	+1.5	+2.3	+2.1	+2.5	+1.5	+2.4	+1.4	+2.4	+1.8	+2.5
Private consumption (real)	+1.4	+2.1	+2.1	+1.7	+2.5	+1.9	+2.6	+1.3	+2.7	x	x	+1.8	+2.4
Government consumption (real)	+0.5	+0.3	+0.3	+0.0	+0.0	+0.0	+0.0	+0.7	+0.7	x	x	+0.4	+0.4
Gross fixed capital formation (real) <sup>1</sup>	+3.3	+4.2	+4.7	+2.7	+3.2	+3.3	+3.5	+3.3	+4.4	x	x	+4.3	+3.9
Exports (real)	+4.0	+6.4	+7.5	+4.4	+6.0	+4.1	+6.4	+4.7	+6.8	x	x	+4.4	+6.5
Imports (real)	+4.5	+6.5	+7.4	+4.0	+6.5	+3.9	+6.3	+4.3	+7.6	x	x	+5.1	+6.7
GDP per employee	+1.2	+1.8	+1.6	+1.0	+1.4	+1.7	+1.7	x	x	x	x	+1.4	+1.8
GDP deflator	+1.5	+1.4	+1.6	+1.8	+1.5	+1.7	+1.8	+1.6	+1.1	+1.4	+1.4	+1.5	+1.2
CPI	x	x	x	+1.6	+1.5	+1.5	+1.7	x	x	+1.3	+1.3	x	x
HICP	+1.7	+1.5	+1.6	+1.4	+1.3	x	x	+1.2	+1.1	x	x	+1.4	+1.3
Unit labor costs	+0.8	+0.7	+1.0	+1.2	+1.2	x	x	x	x	x	x	+1.2	+0.9
Payroll employment	+0.2	+0.6	+0.8	+0.5	+0.8	+0.3	+0.8	x	x	x	x	+0.4	+0.7
%													
Unemployment rate <sup>2</sup>	4.5	4.4	4.1	4.5	4.5	4.4	4.3	5.9	5.8	4.4	4.1	4.5	4.3
<i>% of nominal GDP</i>													
Current account	-1.2	-1.1	-0.9	-0.4	-0.7	-0.5	-0.4	-0.2	-0.3	-0.2	-0.5	-0.4	-0.4
Government surplus/deficit	-1.4	-1.9	-1.7	-1.0	-1.5	-1.1	-1.5	-1.3	-1.9	-0.9	-1.7	-1.1	-1.9
<b>External assumptions</b>													
Oil price in USD/barrel of Brent	34.6	31.8	29.2	31.0	31.0	29.0	29.0	32.0	32.0	30.0	27.0	31.1	28.9
Short-term interest rate in %	2.1	2.1	2.1	2.0	1.8	2.2	2.4	1.7	1.8	2.1	2.6	x	x
USD/EUR	1.21	1.19	1.19	1.22	1.22	1.22	1.20	1.20	1.23	1.23	1.23	1.25	1.24
<i>Annual change in %</i>													
Euro area GDP (real)	1.4–2.0	1.7–2.7	x	+1.4	+2.0	x	x	+1.6	+2.4	+1.7	+2.3	+1.7	+2.3
U.S. GDP (real)	+4.6	+3.6	+3.0	+3.8	+2.5	+4.0	+3.0	+4.7	+3.7	+4.6	+3.9	+4.2	+3.2
World GDP (real)	+4.8	+4.6	+4.5	x	x	x	x	x	x	+4.6	+4.4	+4.5	+4.3
World trade	+7.2	+7.6	+7.7	+7.5	+6.0	+12.0	+8.0	+8.6	+10.2	+6.8	+6.6	+8.3	+7.8

Source: OeNB, WIFO, IHS, OECD, IMF, European Commission.

<sup>1</sup> For IHS: Gross investment.

<sup>2</sup> Eurostat definition; for OECD: OECD definition.

## Annex I: The Impact of the Carry-Over Effect on Annual GDP Growth Rates

In compiling its forecasts, the OeNB uses a macroeconomic model based on quarterly data. The forecasts place special emphasis on trends in the course of the year by taking quarterly growth rates into account, as annual growth rates can often conceal the dynamics of growth over the year. Our presentation of forecast results, how-

ever, is primarily based on growth in aggregate annual values. The average growth in one year compared to the previous year is not only determined by the development of quarterly growth rates, it is also based on the growth rates of the previous year. Mathematically, the annual growth rate for a macroeconomic indicator such as GDP for the year 2004 ( $\Delta GDP_{2004}$ ) can be approximated on the basis of quarterly growth rates using the following formula:

$$\begin{aligned} \Delta GDP_{2004} = & \frac{1}{4} \Delta GDP_{2003Q2} + \frac{2}{4} \Delta GDP_{2003Q3} + \frac{3}{4} \Delta GDP_{2003Q4} + \\ & + \frac{4}{4} \Delta GDP_{2004Q1} + \frac{3}{4} \Delta GDP_{2004Q2} + \frac{2}{4} \Delta GDP_{2004Q3} + \frac{1}{4} \Delta GDP_{2004Q4} \end{aligned} \quad (1)$$

As shown in equation (1), GDP growth in the year 2004 is not determined by quarterly growth rates in 2004 alone; 37.5% (=  $\frac{1}{4}$  divided by  $\frac{1}{6/4}$ ) of this figure is determined by the growth rate in 2003, with growth toward the end of 2003 playing a more important role than growth at the beginning of that year. The weighted total of quarterly growth rates (the first line in equation (1)) is also referred to as the *carry-over effect* on the 2004 annual growth rate. This effect indicates how high the 2004 annual growth rate would be if GDP were to remain at the same level as in the fourth quarter of 2003. If, for example, we assume that in each quarter of 2003 the economy expands by 0.5% over the previous quarter and then stagnates at it the level of the fourth quarter of 2003, then the carry-over effect alone implies an annual growth rate of 0.75% (=  $\frac{1}{4} * 0.5 + \frac{2}{4} * 0.5 + \frac{3}{4} * 0.5$ ) for 2004.

Since 1988, the carry-over effect has ranged from 0.06% (for annual growth in 2002) to 1.95% (1990). The average carry-over effect comes to 0.96%. Apparently insignificant revisions of historical data which leave

the annual growth rate unchanged and only change the pattern of growth over a given year can have considerable effects on growth in the ensuing year. This situation arose when the SNA figures for 2003 were last revised in March 2004. In stark contrast to previous publications, real GDP growth in 2003 was almost entirely concentrated in the first quarter of the year. Accordingly, the carry-over effect for annual growth in 2004 is now more than 0.3 percentage point lower (see table 11 in this annex).

The *current quarterly development* of seasonally adjusted real GDP is characterized by a *high level of uncertainty*. Numerous indicators suggest that growth picked up in the second half of 2003, whereas it was fairly subdued the first half of the year. This pattern would also correspond more directly to the growth pattern in the euro area, which Austria has tracked closely in the past due to its high level of integration in this economic area. Austria's confidence indicators, which increased in line with the international trend in the second half of 2003, also point to recovering economic activity in the course of 2003. Likewise, pos-

itive signals from the financial markets are to be interpreted in a similar way. Equity indices rose markedly in the course of 2003, and lending seems to have bottomed out during the year

as well. The lending volume in Austria was lower year on year in the second quarter of 2003, whereas lending growth gained momentum steadily in the second half of 2003.

Table 11

### Real GDP Growth Rates Published and Projected for 2003 on Various Dates

	June 2003 <sup>1</sup>	September 2003 <sup>1</sup>	December 2003 <sup>1</sup>	March 2004 <sup>1</sup>
<i>Quarterly growth rates in %</i>				
Q1 2003	<b>0.17</b>	<b>0.02</b>	<b>0.12</b>	<b>0.51</b>
Q2 2003	0.16 <sup>2</sup>	<b>0.26</b>	<b>0.34</b>	<b>0.01</b>
Q3 2003	0.37 <sup>3</sup>	0.37 <sup>3</sup>	<b>0.33</b>	<b>0.15</b>
Q4 2003	0.29 <sup>3</sup>	0.29 <sup>3</sup>	0.29 <sup>3</sup>	<b>0.09</b>
<i>Annual growth in %</i>				
2003	0.88	0.87	0.75	0.88
<i>Carry-over effect for annual growth in 2004</i>				
	0.44	0.46	0.46	0.14

Source: Eurostat, OeNB.

<sup>1</sup> As at the time of Publication.

<sup>2</sup> OeNB spring 2003 outlook.

<sup>3</sup> OeNB fall 2003 outlook.

Note: Published data are shown in bold print.

The SNA figures published for the expenditure side of GDP are a major factor in creating doubts as to the published quarterly profile. Weak growth in the second half of 2003 can essentially be put down to the statistical discrepancy's highly negative contribution to growth, which signals a large difference between the production and the expenditure side of GDP. The contribution of demand components to growth (domestic demand plus net exports), in contrast, rose 0.5 percentage point (to 1.1 percentage points) compared to the first half of 2003.

In *this forecast*, the growth pattern for 2003 has been corrected by increasing the carry-over effect for the year 2004 by 0.3 percentage point; this was done by increasing the quar-

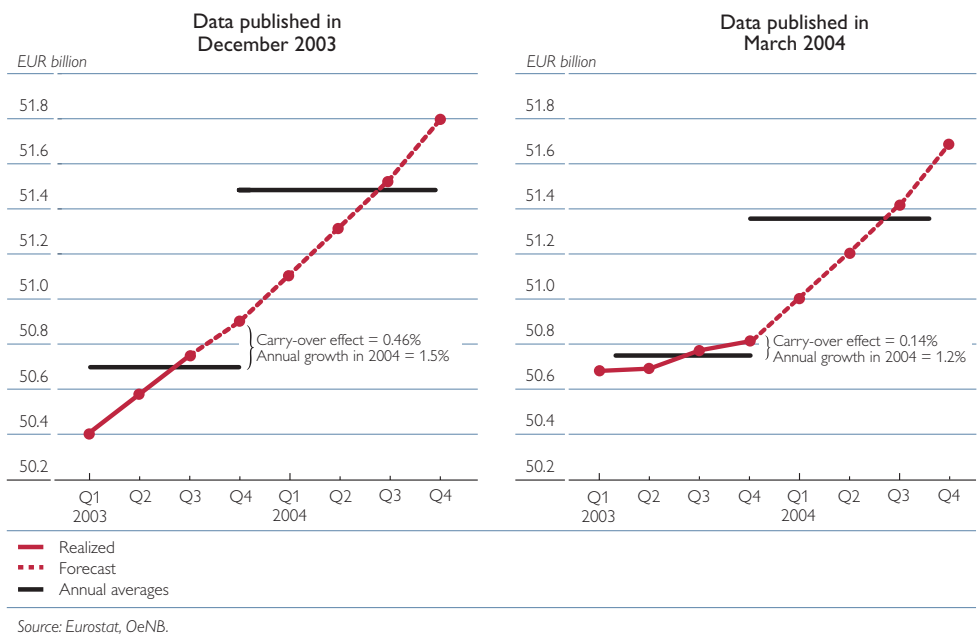
terly growth rate for the first forecast quarter accordingly.

Chart 2 illustrates the effects of this "data revision" on GDP growth in 2004. In the left-hand diagram, historical data up to the third quarter of 2003 (published in December 2003) are used in conjunction with the current forecast's quarterly growth rates from the fourth quarter of 2003 onward (without the correction in the first quarter of 2004). This results in an annual growth rate of 1.5% for 2004. Extrapolating the data published in March 2004 with the projected values for 2004 would yield a growth rate of only 1.2% for 2004 (right-hand diagram, chart 2). The difference of 0.3 percentage point is entirely based on the difference in carry-over effects.

Chart 2

**Effects of the Data Published in March 2004 on Annual GDP**

**Growth in OeNB Forecasts**



## Annex 2: Detailed Result Tables

Table 12

Demand Components (Real Prices)								
at 1995 prices								
	2003	2004	2005	2006	2003	2004	2005	2006
	EUR million				Annual change in %			
Private consumption	114,256	115,808	118,221	120,701	+1.4	+1.4	+2.1	+2.1
Government consumption	36,911	37,081	37,192	37,290	+0.7	+0.5	+0.3	+0.3
Gross fixed capital formation	46,834	48,359	50,410	52,756	+4.4	+3.3	+4.2	+4.7
thereof: Investment in plant and equipment	19,194	19,950	20,946	22,073	+6.0	+3.9	+5.0	+5.4
Residential construction investment	9,061	9,174	9,386	9,686	+1.7	+1.3	+2.3	+3.2
Investment in other construction and other investment	18,579	19,234	20,078	20,997	+4.1	+3.5	+4.4	+4.6
Changes in inventories (incl. statistical discrepancy)	757	918	1,240	1,224	x	x	x	x
Domestic demand	198,757	202,166	207,063	211,971	+1.8	+1.7	+2.4	+2.4
Exports of goods and services	112,317	116,796	124,220	133,493	+0.8	+4.0	+6.4	+7.5
Imports of goods and services	108,051	112,965	120,259	129,143	+2.5	+4.5	+6.5	+7.4
Net exports	4,266	3,831	3,961	4,350	x	x	x	x
<b>Gross domestic product</b>	<b>203,023</b>	<b>205,996</b>	<b>211,024</b>	<b>216,321</b>	<b>+0.9</b>	<b>+1.5</b>	<b>+2.4</b>	<b>+2.5</b>

Source: 2003: Statistics Austria, 2004 to 2006: OeNB spring 2004 outlook.

Table 13

Demand Components (Current Prices)								
	2003	2004	2005	2006	2003	2004	2005	2006
	EUR million				Annual change in %			
Private consumption	127,616	131,473	136,348	141,519	+3.0	+3.0	+3.7	+3.8
Government consumption	42,009	43,174	44,388	45,614	+3.3	+2.8	+2.8	+2.8
Gross fixed capital formation	51,188	53,663	56,750	60,260	+5.9	+4.8	+5.8	+6.2
Changes in inventories (incl. statistical discrepancy)	-2,001	-2,116	-2,464	-3,144	x	x	x	x
Domestic demand	218,812	226,194	235,023	244,249	+2.9	+3.4	+3.9	+3.9
Exports of goods and services	116,193	120,926	129,374	140,152	+0.7	+4.1	+7.0	+8.3
Imports of goods and services	112,743	118,174	126,669	136,905	+1.7	+4.8	+7.2	+8.1
Net exports	3,450	2,752	2,705	3,247	x	x	x	x
<b>Gross domestic product</b>	<b>222,262</b>	<b>228,946</b>	<b>237,728</b>	<b>247,496</b>	<b>+2.4</b>	<b>+3.0</b>	<b>+3.8</b>	<b>+4.1</b>

Source: 2003: Statistics Austria, 2004 to 2006: OeNB spring 2004 outlook.

Table 14

Deflators of Demand Components								
	2003	2004	2005	2006	2003	2004	2005	2006
	1995 = 100				Annual change in %			
Private consumption	111.7	113.5	115.3	117.2	+1.5	+1.6	+1.6	+1.7
Government consumption	113.8	116.4	119.3	122.3	+2.6	+2.3	+2.5	+2.5
Gross fixed capital formation	109.3	111.0	112.6	114.2	+1.4	+1.5	+1.4	+1.5
Domestic demand (excl. changes in inventories)	111.5	113.4	115.4	117.4	+1.7	+1.7	+1.7	+1.7
Exports of goods and services	103.4	103.5	104.1	105.0	-0.1	+0.1	+0.6	+0.8
Imports of goods and services	104.3	104.6	105.3	106.0	-0.8	+0.3	+0.7	+0.6
Terms of trade	99.1	99.0	98.9	99.0	+0.7	-0.2	-0.1	+0.2
<b>Gross domestic product</b>	<b>109.5</b>	<b>111.1</b>	<b>112.7</b>	<b>114.4</b>	<b>+1.5</b>	<b>+1.5</b>	<b>+1.4</b>	<b>+1.6</b>

Source: 2003: Statistics Austria, 2004 to 2006: OeNB spring 2004 outlook.



Table 15

**Labor Market**

	2003	2004	2005	2006	2003	2004	2005	2006
	1,000				Annual change in %			
Total employment	4,076.7	4,085.4	4,110.3	4,145.2	+0.2	+0.2	+0.6	+0.8
thereof: Private sector employment	3,554.9	3,565.4	3,592.8	3,632.1	+0.3	+0.3	+0.8	+1.1
Payroll employment (national accounts definition)	3,327.4	3,335.7	3,359.7	3,393.9	+0.3	+0.3	+0.7	+1.0
	%							
Unemployment rate (Eurostat definition)	4.4	4.5	4.4	4.1	x	x	x	x
	% of real GDP							
Unit labor costs (whole economy) <sup>1</sup>	69.3	69.8	70.3	71.0	+1.7	+0.8	+0.7	+1.0
	At 1995 prices, EUR 1,000							
Labor productivity (whole economy)	49.8	50.4	51.3	52.2	+0.7	+1.2	+1.8	+1.6
Real compensation per employee <sup>2</sup>	30.9	31.0	31.3	31.6	+0.8	+0.4	+0.9	+1.0
	At current prices, EUR 1,000							
Gross compensation per employee	34.5	35.2	36.1	37.1	+2.4	+2.1	+2.5	+2.7
	At current prices, EUR million							
Total gross compensation of employees	114,801	117,465	121,254	125,811	+2.6	+2.3	+3.2	+3.8

Source: 2003: Statistics Austria, 2004 to 2006: OeNB spring 2004 outlook.

<sup>1</sup> Gross wages as a ratio of real GDP.<sup>2</sup> Gross wages per employee divided by the private consumption deflator.

Table 16

**Current Account**

	2003	2004	2005	2006	2003	2004	2005	2006
	EUR million				% of nominal GDP			
<b>Balance of trade</b>	2,477.7	1,737.4	1,929.7	2,473.6	1.1	0.8	0.8	1.0
Balance on goods	1,654.1	1,397.5	1,563.9	2,087.0	0.7	0.6	0.7	0.8
Balance on services	823.6	339.9	365.8	386.6	0.4	0.1	0.2	0.2
Euro area	-10,417.4	-10,908.9	-11,166.3	-11,267.2	-4.7	-4.8	-4.7	-4.6
Non-euro area countries	12,895.1	12,646.3	13,095.9	13,740.7	5.8	5.5	5.5	5.6
<b>Balance on income</b>	-2,457.6	-2,498.0	-2,540.0	-2,641.0	-1.1	-1.1	-1.1	-1.1
<b>Balance on transfers</b>	-2,065.0	-2,018.0	-2,098.8	-2,110.6	-0.9	-0.9	-0.9	-0.9
<b>Current account</b>	-2,044.9	-2,778.6	-2,709.2	-2,278.0	-0.9	-1.2	-1.1	-0.9

Source: 2003: OeNB, 2004 to 2006: OeNB spring 2004 outlook.

Table 17

Quarterly Forecast Results															
	2004	2005	2006	2004				2005				2006			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<i>Annual change in %</i>															
<b>Prices, wages and costs</b>															
HICP	+1.7	+1.5	+1.6	+1.4	+1.8	+1.7	+1.8	+1.6	+1.4	+1.5	+1.5	+1.5	+1.6	+1.6	+1.6
HICP (excl. energy)	+1.5	+1.5	+1.8	+1.6	+1.5	+1.4	+1.4	+1.3	+1.3	+1.5	+1.6	+1.7	+1.8	+1.8	+1.9
Private consumption expenditure (PCE) deflator	+1.6	+1.6	+1.7	+1.3	+1.9	+1.6	+1.7	+1.7	+1.6	+1.5	+1.5	+1.5	+1.6	+1.7	+1.8
Gross fixed capital formation deflator	+1.5	+1.4	+1.5	+1.1	+1.5	+1.7	+1.8	+1.7	+1.5	+1.3	+1.3	+1.3	+1.4	+1.5	+1.6
GDP deflator	+1.5	+1.4	+1.6	+1.7	+1.6	+1.6	+1.2	+1.3	+1.4	+1.4	+1.4	+1.5	+1.5	+1.6	+1.7
Unit labor costs	+0.8	+0.7	+1.0	+1.5	+1.0	+0.6	+0.2	+0.6	+0.7	+0.7	+0.7	+0.8	+1.0	+1.2	+1.2
Nominal wages per employee	+2.1	+2.5	+2.7	+2.3	+2.2	+2.0	+1.9	+2.1	+2.4	+2.7	+2.8	+2.8	+2.7	+2.7	+2.7
Productivity	+1.2	+1.8	+1.6	+0.8	+1.2	+1.4	+1.7	+1.5	+1.7	+2.0	+2.1	+2.0	+1.7	+1.5	+1.4
Real wages per employee	+0.4	+0.9	+1.0	+0.9	+0.3	+0.4	+0.1	+0.4	+0.8	+1.1	+1.2	+1.2	+1.1	+1.0	+0.8
Import deflator	+0.3	+0.7	+0.6	+0.0	+0.4	+0.9	-0.3	+0.5	+0.7	+0.7	+0.8	+0.8	+0.7	+0.6	+0.5
Export deflator	+0.1	+0.6	+0.8	+0.9	+0.7	-0.6	-0.6	-0.1	+0.4	+0.9	+1.1	+1.0	+0.9	+0.7	+0.6
Terms of trade	-0.2	-0.1	+0.2	+0.8	+0.3	-1.5	-0.3	-0.5	-0.3	+0.2	+0.3	+0.2	+0.2	+0.2	+0.0
<i>At 1995 prices, annual and/or quarterly changes in %</i>															
<b>Economic activity</b>															
GDP	+1.5	+2.4	+2.5	+0.7	+0.4	+0.4	+0.5	+0.7	+0.7	+0.7	+0.6	+0.6	+0.6	+0.6	+0.6
Private consumption	+1.4	+2.1	+2.1	+0.9	+0.3	+0.4	+0.5	+0.5	+0.6	+0.6	+0.6	+0.5	+0.5	+0.5	+0.5
Government consumption	+0.5	+0.3	+0.3	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1
Gross fixed capital formation	+3.3	+4.2	+4.7	+1.6	+0.9	+0.9	+1.0	+1.1	+1.1	+1.1	+1.1	+1.1	+1.1	+1.2	+1.2
<i>thereof: Investment in plant and equipment</i>	+3.9	+5.0	+5.4	+0.8	+0.8	+0.9	+1.0	+1.3	+1.5	+1.4	+1.4	+1.3	+1.3	+1.3	+1.2
<i>Residential construction investment<sup>1</sup></i>	+1.3	+2.3	+3.2	+2.0	+0.6	+0.5	+0.5	+0.5	+0.6	+0.6	+0.7	+0.8	+0.9	+0.9	+0.9
Exports	+4.0	+6.4	+7.5	+1.2	+1.3	+1.3	+1.4	+1.5	+1.7	+1.8	+1.8	+1.9	+1.8	+1.8	+1.8
Imports	+4.5	+6.5	+7.4	+2.6	+1.5	+1.5	+1.5	+1.5	+1.6	+1.7	+1.8	+1.8	+1.8	+1.9	+1.8
<i>Contribution to real GDP growth in percentage points</i>															
Domestic demand	+1.6	+2.2	+2.3	+0.9	+0.4	+0.5	+0.5	+0.6	+0.6	+0.6	+0.6	+0.6	+0.5	+0.6	+0.6
Net exports	-0.2	+0.1	+0.2	-0.7	-0.1	-0.1	+0.0	+0.0	+0.1	+0.1	+0.1	+0.1	+0.0	+0.0	+0.0
Changes in inventories	+0.1	+0.2	+0.0	+0.5	+0.1	+0.0	+0.0	+0.1	+0.1	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0
<i>%</i>															
<b>Labor market</b>															
Unemployment rate (Eurostat definition)	4.5	4.4	4.1	4.5	4.5	4.5	4.4	4.4	4.4	4.3	4.3	4.3	4.2	4.1	4.0
<i>Annual and/or quarterly changes in %</i>															
Total employment	+0.2	+0.6	+0.8	+0.0	+0.1	+0.1	+0.1	+0.2	+0.2	+0.2	+0.2	+0.2	+0.2	+0.2	+0.2
<i>thereof: Private sector employment</i>	+0.3	+0.8	+1.1	+0.0	+0.1	+0.1	+0.2	+0.2	+0.2	+0.2	+0.2	+0.3	+0.3	+0.3	+0.3
Payroll employment	+0.3	+0.7	+1.0	+0.0	+0.1	+0.1	+0.1	+0.2	+0.2	+0.2	+0.2	+0.3	+0.3	+0.3	+0.3
<i>At 1995 prices, annual and/or quarterly changes in %</i>															
<b>Additional variables</b>															
Disposable household income	+1.0	+2.4	+2.2	+0.2	+0.2	+0.2	+0.4	+1.0	+0.6	+0.6	+0.5	+0.5	+0.5	+0.6	+0.6
<i>% of nominal disposable household income (saving ratio) and % of real GDP (output gap)</i>															
Household saving ratio	7.7	8.1	8.3	7.8	7.7	7.6	7.6	8.0	8.1	8.1	8.1	8.2	8.3	8.4	8.5
Output gap	-1.0	-0.3	0.4	-1.0	-1.0	-0.9	-0.8	-0.5	-0.3	-0.2	-0.1	0.1	0.3	0.5	0.7

Source: OeNB spring 2004 outlook. Quarterly data are seasonally adjusted.

<sup>1</sup> Excluding other investment in construction and other investment.

# The Impact of Oil Price Changes on Growth and Inflation

Martin Schneider

This contribution looks into the impact of oil price changes on growth and inflation. Oil price shocks affect the economy through the supply side (higher production costs, reallocation of resources), the demand side (income effects, uncertainties) and the terms of trade. The effects of oil price shocks have become less intense over time (thanks to technological innovation, the development of cost-effective alternative sources of energy, sectoral change and the structural change of the oil market) and are asymmetric. An increase in the price of oil feeds through to GDP growth to a much larger extent than a decline, a phenomenon that can be attributed to adjustment costs associated with sectoral reallocations, the implications of uncertainties for spending on consumer durables and investment, and nominal wage rigidities. Furthermore, the element of surprise in oil price hikes seems to play a considerable role. Thus, when a rise in the price of oil occurs after a prolonged period of oil price stability, it has a larger impact than a price hike which immediately follows previous cuts.

The role of monetary policy is still a controversial issue.

According to some authors, a tightening of monetary policy following an oil price shock has a much more severe impact than the direct effects of the oil price shock themselves. However, empirical evidence on this matter is ambiguous. Current simulations for the euro area, the U.S.A. and Japan show that a constant oil price rise of 10% generates negative growth effects of some 0.1% a year in the first three years – not taking into account monetary responses. After that, the negative effects quickly fade. The impact on inflation ranges from 0.1 to 0.2 percentage point, with Austria at the lower end of the international spectrum. A simulation of the effects caused by the oil price remaining stable at USD 40 as of the third quarter of 2004 instead of falling to USD 29.2 until 2006 – as assumed in the OeNB Spring 2004 Outlook – would slow down growth in Austria by 0.03 percentage point in 2004 and by 0.2 percentage point in both 2005 and 2006. Inflation would be 0.1, 0.4 and 0.3 percentage point higher in 2004, 2005 and 2006, respectively.

## I Transmission Channels of Oil Prices

Oil price shocks affect the economy through different channels: the supply side, the demand side and the terms of trade. *Supply suffers as production costs rise* in the wake of an oil price shock. Given substitution between production factors, relative price changes result in a *reallocation of the means of production*. This, in turn, cushions the negative effects. The long-term effects on production capacity are thus less pronounced than the short-term effects, which are dominated by frictions arising as a result of resource reallocations and by uncertainties about the subsequent development of oil prices. However, these intersectoral reallocations also generate costs (training expenses, irreversible investments, etc.). The actual impact on investment essentially depends on the expectations about the stability of oil price changes, which tend to vary over time. On the *demand* side, oil price shocks drive up the general level

of prices, which translates into lower real disposable incomes and thus reduces demand.

Apart from their direct effects on the general *price level*, oil prices also have second-round effects, as *rigid nominal wages* and *price and wage indexation* add to inflation. Higher wage pressures and weaker demand dampen employment. In addition to that, a deterioration of confidence and stock market reactions can amplify the impact of a shock. Furthermore, economies are hit by changes in the international environment brought about by oil price shocks. Climbing import prices trigger a deterioration of the *terms of trade* and thus precipitate welfare losses. Apart from the channels described so far, the *monetary policy response* plays an important role (see chapter 3). The above findings apply to oil importing countries. *Oil exporting countries* benefit from higher export revenues, which are, however, diminished by a decline in global demand.

## 2 Asymmetry and Waning of Effects over Time

Virtually every empirical study finds asymmetric effects. An increase in the price of oil feeds through to GDP growth to a much larger extent than a decline. This phenomenon can be attributed to *adjustment costs associated with sectoral reallocations* and the *implications of uncertainties for spending on consumer durables and investment*. According to the so-called *dispersion hypothesis*, oil price hikes lead to a reallocation of resources from energy-intensive to energy-efficient sectors. As this reallocation progresses only gradually due to adjustment costs involved, a short-term decline in output results, which intensifies the economic slowdown. On the other hand, when oil prices shrink, the consequent expansion of aggregate output is dampened by adjustment costs. In this connection, adjustment costs on the labor market play an important role according to the *dispersion hypothesis*. *Nominal wage rigidities* also help explain asymmetric effects. When oil prices rise, employees will try to compensate the loss of their purchasing power by negotiating wage hikes. However, increases in real purchasing power caused by lower oil prices do not lead to sinking nominal wages. Another explanation for these asymmetric effects is that decisions on whether or not to buy consumer durables and capital goods (cars, real estate, heating, insulation, production facilities, etc.) are often based on energy prices. Oil supply problems fuel *uncertainty* and lead to an abrupt contraction of such expenditures. Therefore, rising oil prices entail a decline in demand, while falling oil prices do not trigger a spike in demand.

Since the 1970s the *correlation* between oil prices and GDP growth has

*weakened*. Technological innovation, the development of cost-effective alternative sources of energy and sectoral change have diminished the ratio of oil imports to GDP in industrialized countries.

*Modeling the correlation* between oil prices and GDP growth is difficult not only because of the reduced impact of oil prices on GDP, but also because of changes in oil market structures. With the Organization of the Petroleum Exporting Countries' (OPEC) influence receding after 1980, oil prices have been increasingly dependent on demand (endogeneity problem). Furthermore, oil prices have become much more volatile since the introduction of forward and futures markets in the 1980s. In addition to that, central banks have changed their ways of reacting over time, which has contributed to the fading influence of oil prices on growth. These altered statistical properties have made it impossible for simple linear models to adequately describe the impact of oil prices on GDP growth. Empirical research thus predominantly uses nonlinear specifications (see e.g. Hooker, 1999a; Hamilton, 2003) and finds a relatively stable correlation between oil prices and GDP growth for the entire postwar period. Lee et al. (1995), for instance, transform the oil price, dividing the oil price change by the current volatility. Their study is also a first step towards measuring the *element of surprise in oil price changes*. Accordingly, when a rise in the price of oil follows a prolonged period of stable oil prices (during which there is small current volatility), it has a stronger impact than a price hike which comes as an immediate adjustment of previous price drops.

### 3 The Role of Monetary Policy

When confronted with an oil price shock, monetary policymakers face a fundamental tradeoff. Depending on their monetary policy strategy, they can try to either counter real effects with expansive measures or to fight inflationary effects with restrictive measures. Monetary policy can therefore significantly determine the effects oil price changes have in the short run.

The empirical evidence on effects (and reactions) of monetary policy varies greatly. Some authors describe a *strongly restrictive impact of monetary policy* and weak to nonexistent direct effects. Conducting simulations with Vector Autoregressive (VAR) models, Bernanke et al. (1997) have found that a majority of the real effects of oil price shocks are not caused directly by the shock but by the subsequent *tightening of monetary policy*. According to Barsky and Kilian (2001), the 1970s stagflation was solely induced by monetary policy. The boom at the end of the 1960s was triggered by expansive monetary policy and resulted in price pressures for industrial goods and raw materials. Barsky and Kilian argue that the oil price hikes of 1973–74 (as well as 1979–80) were an endogenous reaction to the expansive monetary policy conducted by the Federal Reserve (Fed). The subsequent tightening of monetary policy led to stagflation. Barsky and Kilian partly based their arguments on leading indicators, which predicted that a recession would hit already in early 1973 (nine months prior to the first oil price shock but shortly after the tightening of monetary policy). Bohi (1989) goes one step further and largely disputes that oil prices by themselves have any significant macro-

economic impact. His claim is primarily based on the finding that no correlation between energy intensity and employment changes can be observed when analyzing disaggregated data from the periods following the oil price shocks of 1973 and 1979. Instead – just like Barsky and Kilian (2001) – he blames the restrictive monetary and fiscal policies of the U.S.A., the United Kingdom, Germany and Japan for the lackluster performance of these economies.

One question immediately arising in this context is how to define a *neutral reaction of monetary policymakers* to oil price shocks. In simulations conducted by Bernanke et al. (1997), the interest rate climbs after oil prices rise, while real GDP shrinks. By comparing these effects with a neutral reaction by monetary policymakers, the authors find that the negative effects of the oil price shock are mostly caused by monetary policy responses. However, this outcome decisively depends on how a neutral reaction of monetary policymakers is defined. Bernanke et al. define it as a constant interest rate after the shock, as opposed to the rising interest rate in the baseline scenario. Stable interest rates are, however, not the only option. Brown and Yücel (1998) examine how the definition of a neutral response determines the stability of the outcomes of Bernanke et al. Using alternative definitions of a neutral monetary policy response (a constant monetary aggregate or unchanged nominal GDP levels), they find that the Fed's reaction to previous oil price shocks has been neutral. Effects on GDP would thus have to be directly attributed to oil prices.

Some authors – such as Hamilton and Herrera (2001) – question a *strongly restrictive effect of monetary*

*policy* and believe there are stronger direct effects. There are, however, also studies describing an *expansive effect of monetary policy* in the wake of oil price shocks. Hooker (1999a), for example, has studied the impact of oil prices on U.S. inflation. While oil prices strongly affected core inflation prior to 1980, their influence conceivable regressed thereafter. Hooker ascribes this structural break to a shift in the monetary policy response. His VAR simulations, which use empirically estimated reaction functions of the Fed, indicate that before 1980, the Fed always answered oil price hikes with a considerable loosening of monetary policy. Its responses after 1980 were much weaker.

Overall it can be said that empirical evidence varies greatly. Changes in the structure of the oil markets, in demand patterns and in the reaction of monetary policymakers make it difficult to produce reliable empirical outcomes. On top of that, the commonly used VAR models are very sensitive to changes in specifications.

#### **4 Oil Price Developments since World War II**

Oil price developments since World War II up to the end of the 1990s can roughly be divided into three stages. Leading up to the 1970s, nominal oil prices were stable, while real oil prices slightly fell. The 1970s and early 1980s were characterized by the two oil price shocks of 1973–74 and 1979–80 with skyrocketing oil prices. After oil prices shrank in the first half of the 1980s, nominal oil prices fluctuated up until the 1990s around a relatively stable value of USD 15 to USD 20, with some temporary deviations. Even the surge in the run-up to the first war in Iraq reversed quickly. In terms of percentage

increase the oil price hike of 1999–2000 is comparable to the second oil price shock of 1979–80. In 2001 and 2002 the global economic downturn triggered a temporary plunge in oil prices, which have picked up considerably again since the second war in Iraq was announced.

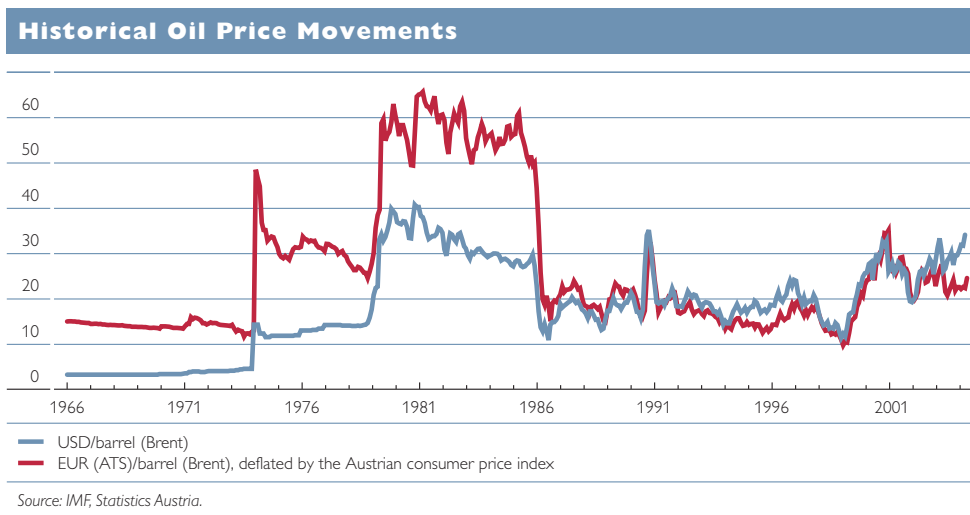
The *first oil price shock of 1973–74* was fueled by several factors. Even before the oil embargo was launched as a reaction to the Yom Kippur War in October 1973, global demand for oil accelerated immensely. The world economy at that time was at a stage marked by strong growth and low interest rates. Currency turmoil led to the collapse of the Bretton Woods System in 1973, ultimately resulting in the abandonment of the previously effective system of fixed exchange rates. The industrialized countries had already posted high inflation rates prior to the oil price shock, and the dollar sharply depreciated. These developments and the production cuts induced by the oil embargo caused oil prices to quadruple within a short time. The recession following the first oil price shock was aggravated by several factors. Monetary policymakers in the industrialized nations at that time were unable to quickly fight inflation. This brought about a change in inflation expectations. The then prevalent wage indexation and the institutional wage formation structures additionally intensified inflation.

The *second oil price shock of 1979–80* hit closely after the Iranian revolution in late 1978 and before the outbreak of the war between Iran and Iraq in October 1980. The international macroeconomic environment was posting solid growth, low interest rates and rising inflation, much like in the early 1970s. Contrary to the first oil price shock, the decline in the

worldwide oil supply was only temporary, as shortfalls in production in Iran and Iraq were offset by expanded output of other oil producers. Most of the price increase took place between the Iranian revolution and the outbreak of the war. At that time global production exceeded prerevolution levels, which means that shortfalls in output cannot serve as an explanation. Rather, current demand expanded as a consequence of heightened uncer-

tainty about possible future shortages and assumed high demand. The monetary policy responses focused on retaining price stability to a much larger degree than during the first oil price shock. In 1979 the Fed started to actively fight inflation. However, inflation expectations, which had risen during the first oil crisis, rendered the real economic costs of containing inflation significant.

Chart 1



In the 1980s OPEC's possibilities to intervene in prices dramatically receded. Oil supply of non-OPEC countries picked up as new oil producers came into existence and other countries, in particular the U.S.A., Mexico and the then USSR, stepped up output. At the same time the global slowdown of the economy lessened demand. This served as an incentive for OPEC producers to expand their market share and consequently their revenues by offering low prices. When Iraq invaded Kuwait in August 1990, the *first Gulf War* started. In the run-up to the war there was a notable rise in oil prices triggered by the high level of uncertainty. As soon as the war started, this uncertainty dissolved and prices quickly fell. During

the ongoing military operations serious shortfalls in production occurred, which were, however, compensated by an increase in output by other countries. As the war went on, oil prices remained stable. After plummeting amid the Asian crisis of 1997–98, they rose sharply in 1999–2000 when global demand heated up. Simultaneously, OPEC regained some of its market power.

When looking at the real price of oil for Austria in euro or schillings (chart 1), the extent of the first oil price shock becomes much more evident. The second oil price hike in 1979–80 had a long-term effect on Austria because the U.S. dollar appreciated in the wake of the hike. The recent oil price increase has been damp-

ened by the appreciation of the euro. Although the current level of the nominal oil price is comparable to the highest level reached during the second oil price shock of 1979–80, the real price in euro is still considerably below half of that value.

There is continuing controversy about what exactly are the determinants of oil price trends. Hamilton (2003) argues that the political and military actions leading up to oil crises are directly responsible for price hikes, whereas Barsky and Kilian (2001) stress the role of a favorable macroeconomic environment as a prerequisite for price rises. Jones and Leiby (1996) have found that oil price increases in the 1970s can be attributed to OPEC's cartel power rather than to shortfalls.

## 5 An Overview of Current Oil Price Elasticities

The oil price elasticities of growth and inflation presented here are either based on macroeconomic models (Dalsgaard et al., 2001; Hunt et al., 2001; International Energy Agency, 2004) or on VAR or Structural Vector Autoregressive (SVAR) models (Abeyasinghe, 2001; Jiménez-Rodríguez and Sánchez, 2004). Hunt et al. (2001) applied the MULTIMOD model of the International Monetary Fund (IMF). The simulations described by the International Energy Agency (2004) were conducted by the Organisation for Economic Co-operation and Development (OECD), using the Interlink model.

Most macroeconomic models can only be used to a limited extent for

analyzing the response of an economy to an oil price shock. For instance, the OECD and IMF models – just like the macroeconomic model of the OeNB – depict the entire supply side of an economy in *one* production function. Therefore, shocks setting off sectoral reallocations cannot be represented adequately. Furthermore, most models fail to depict asymmetries (Jones et al., 2002). Elasticities therefore tend to be underestimated.<sup>1</sup> The intensity of the effects of oil price shocks in macroeconomic models decisively depends on wage and price responses (and in particular on how inflation expectations are modeled), but also on the respective monetary policy reaction function. The simulations conducted by Abeyasinghe (2001) and by Jiménez-Rodríguez and Sánchez (2004) are based on VAR models. These time-series models depict the dynamic interaction between a limited number (generally three to four) of macroeconomic variables such as GDP, oil prices and interest rates. Ciscar et al. (2004) used a multi-regional static General Equilibrium model for their calculations, which comprises 21 regions of the world and 20 sectors per region. The model calculates equilibrium prices at which the respective markets are cleared. Unlike most macroeconomic models, this model distinguishes between different sectors, permitting not only income effects but also the sectoral reallocations deriving from oil price shocks to be simulated. The model presupposes flexible prices. The effects of price rigidities (especially on the labor market) are therefore not

<sup>1</sup> Apart from macroeconomic models and VAR models, there are two more types of models for estimating oil price effects: Aggregated production functions, which were already used in the 1970s, define GDP as a function of production factors such as labor, capital and energy. The real business cycle approach attributes the pattern of booms and busts to the response of the economy to random exogenous shocks. Jones and Leiby (1996) provide a detailed overview of studies applying these different types of models.



Table 1

**Effects of a Permanent 10% Increase in Oil Prices in U.S. Dollars<sup>1</sup>**

Model	GPD			Inflation			
	Euro area	U.S.A.	Japan	Euro area	U.S.A.	Japan	
Average deviation of growth rates in percentage points							
Hunt, Isard and Laxton (2001) – IMF	Macro	-0.05	-0.06	-0.01	+0.28	+0.18	+0.08
International Energy Agency (2004)	Macro	-0.12	-0.07	-0.10	+0.14	+0.10	+0.08
Dalgaard, André and Richardson (2001) – OECD	Macro	+0.04	+0.00	+0.02	+0.04	+0.02	+0.00
Jiménez-Rodríguez and Sánchez (2004) – ECB	VAR	-0.06	-0.17	-0.18	×	×	×
Abeyasinghe (2001)	SVAR	×	-0.05	-0.03	×	×	×
Ciscar et al. (2004)	CGE	-0.10 <sup>2</sup>	-0.09	-0.10	×	×	×
<b>Average</b>		<b>-0.06</b>	<b>-0.07</b>	<b>-0.01</b>	<b>+0.15</b>	<b>+0.10</b>	<b>+0.05</b>
<b>Average excluding the OECD (2001)</b>		<b>-0.09</b>	<b>-0.09</b>	<b>-0.01</b>	<b>+0.21</b>	<b>+0.14</b>	<b>+0.08</b>
Austria							
OeNB (2004)	Macro		-0.02		+0.06		

Notes: CGE: Computable General Equilibrium model. Macro: Macroeconomic model. VAR: Vector Autoregressive model. SVAR: Structural Vector Autoregressive model.

<sup>1</sup> The values listed in the table depict the average deviation of GDP growth rates and inflation rates during the first three years following the oil price shock. The only exception are the results of Ciscar et al. (2004), which are comparative static results, i.e. they show the deviation between the old and the new equilibrium. For reasons of comparability, this deviation was converted into annual growth rates, assuming a three-year adjustment period to the new average.

<sup>2</sup> Result for the entire EU.

depicted. These simulations do not take into account policy reactions.

Given the use of different models and varying definitions of scenarios, the results of the individual studies are comparable only to a limited degree. As the simulations are based on different presumptions about the oil price change, the results have been scaled – assuming linearity – to a 10% increase.

The simulation results shown in table 1 are the average deviations of GDP growth rates and inflation in the first three years following an oil price shock. The simulations show a *deceleration of GDP growth by about 0.1 percentage point a year in the first two to three years*. Subsequent growth effects (as far as reported) can be neglected. On average, the euro area and the U.S.A. are equally affected, with Japan feeling a much smaller impact. The relative effect on the three major economies varies across the studies. The impact on *inflation* ranges from *0.1 to 0.2 percentage point*. In two out of three studies the

euro area feels a stronger burden than the U.S.A.

The extent to which various countries or economies are affected depends on several characteristics. Important aspects are energy intensity (oil consumption relative to GDP), the sectoral structure of the economy, disposable stocks, the mineral oil tax system (specific or ad-valorem tax), citizens' preferences, economic policy responses, the existence and amount of oil reserves and the structure of the labor market and the labor market institutions.

In its simulations, the OECD (Hunt et al., 2001) finds oil price hikes to have consistently positive effects on the global economy. It reports a 0.1 percentage point increase in GDP on the initial value within three years for the entire OECD area and an even higher increase (0.2 percentage point) for the euro area. These effects are attributed to expanded demand for imports by oil exporting countries. They have, however, not been confirmed by other studies.

## 6 An Oil Price Scenario for Austria

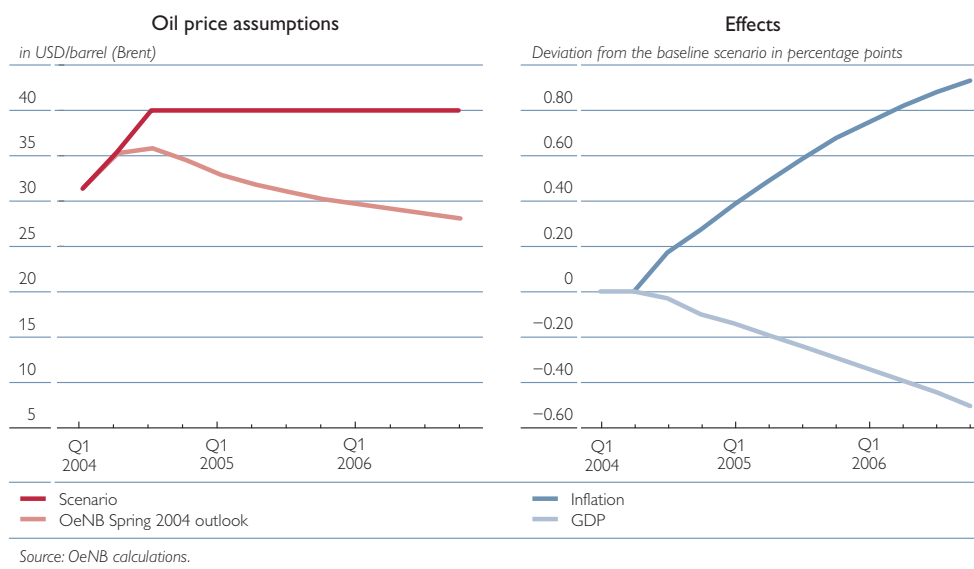
With oil prices currently at a high, it seems particularly interesting to investigate their impact on the Austrian economy. The OeNB Spring Outlook 2004 for the years 2004 to 2006 assumes oil prices of USD 34.6, USD 31.8 and USD 29.2 per barrel of Brent oil for each successive year. These projections are based on the futures prices of May 17, 2004. According to the oil price scenario, prices will come to USD 40 as of the third quarter and will remain at this level until the end of 2006. The effects of this assumption have been simulated with the OeNB's macroeconomic model. A series of additional technical assumptions had to be made. In particular, constant monetary policy conditions, i.e. unchanged nominal interest rates, had to be presupposed. Furthermore, the simulation was based on constant exchange rates. An oil price shock is a global shock with repercussions on the entire world economy. Ideally, such a shock is simulated

with a global model. The simulation at hand takes reactions of other euro area countries to the oil price shock into account by considering elasticities. However, as it fails to regard global reactions outside the euro area, effects are largely underestimated.

In the model the oil price shock takes effect through different mechanisms. Increasing import prices cause domestic price levels to rise, which diminishes real disposable private household income and thus consumer spending. At the same time Austrian export prices pick up. Whether and to which extent exporters then become less competitive depends on the degree of price hikes by Austria's competitors on its export markets. An increase in domestic prices results, ceteris paribus, in a substitution of domestic goods by imports. Investment is determined by two contrary effects. The sinking general level of activity reduces investment demand, while the rising price level – at unchanged nominal interest rates – lessens the real user cost of capital and thus

Chart 2

### The Impact of a Permanent Increase in Oil Prices to USD 40 on Growth and Inflation in Austria



stimulates investment. The simulation shows a small net increase in investment. The model does not capture supply side and sectoral effects.

As the simulations do not start until the third quarter of 2004, growth in 2004 slows down only by 0.03 percentage point. In both 2005 and 2006 GDP growth is expected to fall by 0.2 percentage point. Effects on inflation will be somewhat stronger at 0.1, 0.4 and 0.3 percentage point in

2004, 2005 and 2006, respectively. At the end of 2006 the level of GDP will be 0.5 percentage point below the Spring 2004 Outlook level, while the Harmonised Index of Consumer Prices will be 0.9 percentage point above the level projected in the Spring 2004 Outlook. If a tighter monetary policy is assumed as a response to inflation, price effects would be dampened, while real effects would be even stronger.

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# Sectoral Specialization in Austria and in the EU-15

Jürgen Janger,  
Karin Wagner

*This study examines sectoral specialization patterns in the EU-15 and in the euro area as well as in Austria. These patterns have policy relevance in so far as a high degree of sectoral specialization may trigger asymmetric shocks, foster the emergence of inflation differentials and impact on long-term growth. The developments seen since 1980 have created a favorable climate for conducting the single monetary policy; the degree of sectoral specialization is low in Austria and the EU, it has changed only moderately and has caused neither cyclical nor inflation differentials. At the same time, the individual sectors' shares in value added have changed, in some cases even dramatically. However, there are signs both in the euro area and in Austria that the current sectoral specialization patterns provide suboptimal conditions for long-term growth.*

## I The Economic and Monetary Policy Implications of Sectoral Specialization

The sectoral specialization pattern of an economy – defined as the contribution of the individual economic sectors to value added and employment in a given country – is of relevance to monetary and economic policies for several reasons:

### Asymmetric Shocks and Economic Cycles

One of the most widely discussed issues prior to the start of Economic and Monetary Union (EMU) was the possibility of asymmetric shocks, that is, the possibility of economic shocks occurring in limited areas within the euro area, which would cause differences in business cycles. The degree of specialization of a country's or a region's economy, and, consequently, the level of dissimilarity to another economy in the monetary union, is proportionate to the probability of asymmetric shocks the single monetary policy is unable to respond to (for an overview of possible sources of shocks and their occurrence, see Bayoumi and Prasad, 1996).

### Inflation Differentials

If the price dynamics in different sectors diverge, an increasing degree

of sectoral specialization may cause inflation differentials between countries to widen, which will in turn make it more difficult to pursue a common monetary policy. Inflation differentials can be traced to a large variety of reasons, including cyclical, but also external factors like exchange rate fluctuations and oil price shocks. Egert et al. (2004) show that in Europe inflation differentials have narrowed markedly over the past ten years.

### Long-Term Growth

Some endogenous growth models<sup>1</sup> (e.g. Lucas, 1988) suggest that the growth rate is contingent on the size of the “innovative” sector; more recent empirical studies (e.g. Peneder et al., 2001) indicate an interrelationship between sectoral specialization and economic growth (e.g. through the positive externalities of research activities). Hence, countries with a high degree of specialization in technology-intensive sectors would enjoy growth advantages in the long run. This estimation of potential is essential for assessing the level of inflation-free growth, i.e. the rate at which an economy can grow without building up inflationary pressures.

On the basis of selected indicators, chapter 2 illustrates how sectoral specialization patterns have evolved in

<sup>1</sup> Models which do not take technological progress for granted but give an explicit explanation.

Austria and in the EU-15<sup>2</sup> and describes a number of important determinants of and factors influencing sectoral specialization. Chapter 3 is dedicated to sectoral specialization and long-term growth in Austria and in the EU-15. Chapter 4 concludes on the basis of the developments described in the earlier chapters.

## 2 Development and Determinants of Sectoral Specialization

In contrast to the U.S.A., production structures in the EU-15 countries are relatively homogeneous in terms of the individual sectors' contribution to value added (ECB, 2004). Moreover, specialization indicators show that specialization patterns change very slowly and consistently (table 1). What is most striking is the shift

towards the service sector, in particular towards business services. Only a few countries see increased specialization in technology-intensive industries (e.g. Finland).

### 2.1 Changes in Sectoral Specialization Patterns

#### 2.1.1 Growing Service Sector

A direct comparison between the EU-15 and Austria (chart 1) reveals that the Austrian economic structure largely matches the EU-15's. At 20.5% in 2002 (2001: 21.2%), the contribution of manufacturing to total value added is higher in Austria than in many other EU countries, but like in most EU Member States it is trending downwards. The construction industry's share in value added in Austria is closer to the ratios recorded in the cohesion countries Spain, Portugal

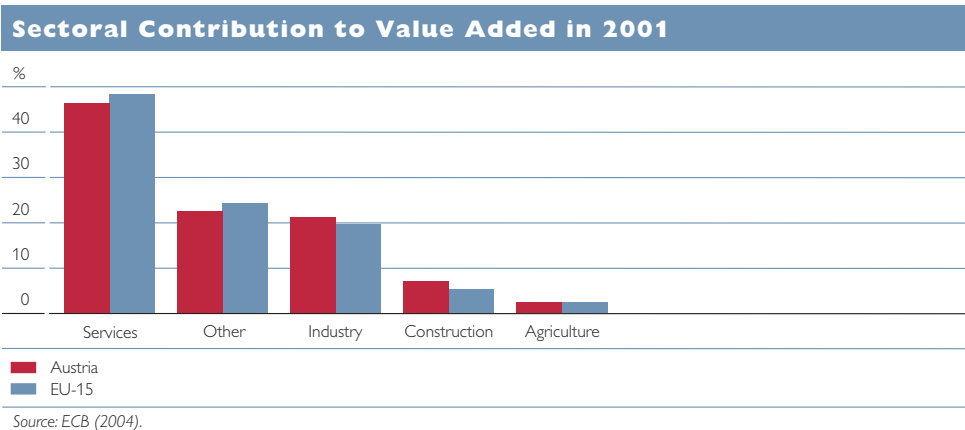
Table 1

Sectoral Specialization Measured by Value-Added at Constant Prices															
	1980					1990					2001				
	Agriculture and forestry	Manufacturing	Business services	Construction	Other	Agriculture and forestry	Manufacturing	Business services	Construction	Other	Agriculture and forestry	Manufacturing	Business services	Construction	Other
	Share in %														
Belgium	1.4	19.9	43.0	6.9	28.8	1.4	21.5	44.4	5.3	27.4	1.5	20.6	46.3	4.9	26.6
Germany	1.5	28.0	36.6	8.6	25.4	1.4	26.1	41.5	6.8	24.1	1.2	20.1	48.0	4.8	25.8
Greece	x	x	x	x	x	8.5	14.7	49.4	7.9	19.5	8.1	12.4	54.8	7.6	17.1
Spain	7.4	19.9	44.9	6.9	20.8	5.9	18.5	44.8	8.0	22.8	4.0	18.7	45.7	8.1	23.5
France	3.6	21.5	43.7	7.0	24.2	3.2	18.3	48.3	6.7	23.4	3.1	19.2	48.7	4.3	24.6
Ireland	x	x	x	x	x	9.6	24.1	x	5.2	x	4.9	37.0	x	5.2	x
Italy	4.2	23.4	42.4	6.6	23.4	3.1	21.9	47.0	5.8	22.2	3.1	21.2	50.3	5.0	20.5
Luxembourg	x	x	x	x	x	1.0	14.5	49.1	6.7	28.7	0.6	11.5	56.3	5.6	26.1
Netherlands	2.7	17.5	41.3	7.9	30.6	3.3	17.9	43.2	6.3	29.2	3.0	16.9	49.6	5.2	25.3
Austria	2.5	20.9	39.9	8.7	28.0	2.3	20.7	44.2	7.0	25.9	2.4	21.2	46.7	7.1	22.6
Portugal	6.3	24.5	37.6	7.9	23.7	5.9	21.8	39.9	6.7	25.7	4.6	20.4	43.4	6.9	24.7
Finland	6.6	22.1	37.3	7.2	26.8	4.7	21.7	41.0	6.7	25.8	3.7	28.8	41.2	4.0	22.3
Euro area weighted average	3.2	23.7	40.6	7.6	25.0	2.9	21.8	44.6	6.5	24.2	2.5	19.8	48.2	5.3	24.1
Denmark	2.8	18.3	43.9	6.4	28.5	3.4	16.9	45.9	5.1	28.7	3.7	16.6	48.4	4.3	27.0
Sweden	2.8	20.5	x	5.8	x	2.8	19.7	40.7	5.5	31.3	2.1	24.4	44.7	4.0	24.8
United Kingdom	2.1	24.6	42.2	5.2	25.9	2.0	22.6	45.0	6.0	24.4	1.3	18.3	50.9	4.8	24.7
EU weighted average	3.0	23.7	40.9	7.3	25.1	2.8	21.8	44.6	6.4	24.5	2.4	19.7	48.5	5.2	24.3

Source: OECD, European Commission, ECB.

<sup>2</sup> The results for the EU-15 are based on a project of the European System of Central Banks (ESCB) and are published in ECB (2004).

Chart 1

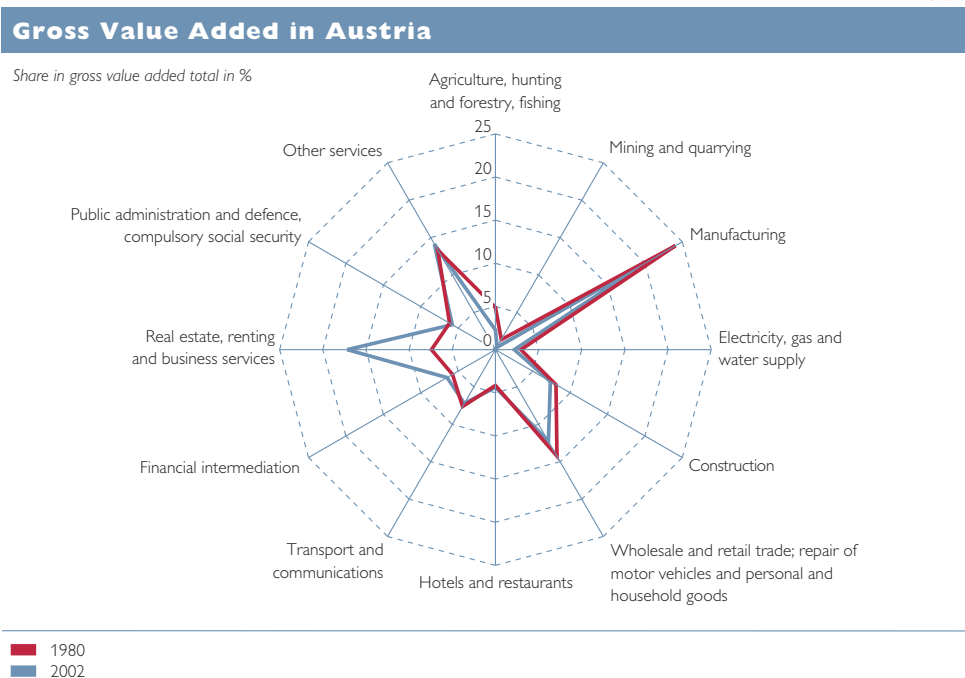


and Greece rather than to those measured in the EU countries with above-average per-capita GDP.

The changes over time (1980 to 2002) clearly reflect the Austrian economy's – albeit slow – shift towards the service sector. Agriculture, hunting and forestry contracted from 4.2% to 2.3%, mining and quarrying

from 1.4% to 0.4%, manufacturing from 22.8% to 20.5%. By contrast, the biggest growth industries were real estate, renting and business services (including IT services), gaining 7.4% to reach 17.2%, as well as financial intermediation, growing by 5.7% to 6.4%.

Chart 2



The individual sectors' growth rates mirror this development: while the tertiary sectors posted above-average rates, the secondary and, in particu-

lar, the primary sectors expanded at below-average rates. The dynamic growth of business services (consulting, software, research services, etc.)

is attributable to the general trend towards outsourcing, new information and communication technologies as well as the increasing knowledge intensity of business activities. Further-

more, tourism is one of the most important components of the Austrian service sector. Given its above-average expansion, Austria's specialization in this sector has increased further.

Table 2

Gross Value Added in Austria			
Sector/industry	1980–2002	1980–1994	1995–2002
	Average growth rate in %		
Real estate, renting and business services	9.1	10.3	6.5
Financial intermediation	5.6	7.4	2.6
Other services	5.3	6.9	2.2
Hotels and restaurants	5.3	5.5	5.0
Total	5.0	5.9	3.3
Transport and communications	4.8	6.3	3.0
Public administration and defence, compulsory social security	4.7	6.8	1.1
Construction	4.6	5.8	2.5
Trade and repairs	4.3	5.1	2.7
Manufacturing	4.3	4.3	3.9
Electricity, gas and water supply	3.6	5.6	–0.4
Agriculture, hunting and forestry	1.4	1.6	1.9
Mining and quarrying	–1.0	–3.0	3.3

Source: OeNB, Statistics Austria.

### 2.1.2 Low Degree of Sectoral Specialization in the EU-15 Changing Only Gradually

Concentration and specialization measures reflect a country's degree of sectoral specialization through an indicator. Krugman's specialization index assumes a value of 0 for a country which has the same economic structure in relation to a benchmark (e.g. Austria in relation to the EU-15) and a value of 2 for a country whose sectoral pattern does in no way match

that of the benchmark. The calculation for the EU-15 (chart 3) shows comparatively small differences in sectoral specialization. The Austrian economy as a whole matches the average economic structure of the EU-15 even to a large extent. At the sectoral level, the degree of congruence is notably higher in manufacturing than in services. Furthermore, the moderate change in the specialization index over time indicates that specialization proceeds slowly.

Table 3

Concentration Indices of Manufacturing Output in Austria							
	1980	1985	1990	1995	2000	2001	2002
	%						
Herfindahl	0.0976	0.0994	0.0974	0.0959	0.093	0.0929	0.095
CR3	40.70	42.70	41.00	40.80	38.70	38.20	39.00
CR5	57.70	59.40	60.80	60.80	60.80	59.20	60.50

Source: OeNB.

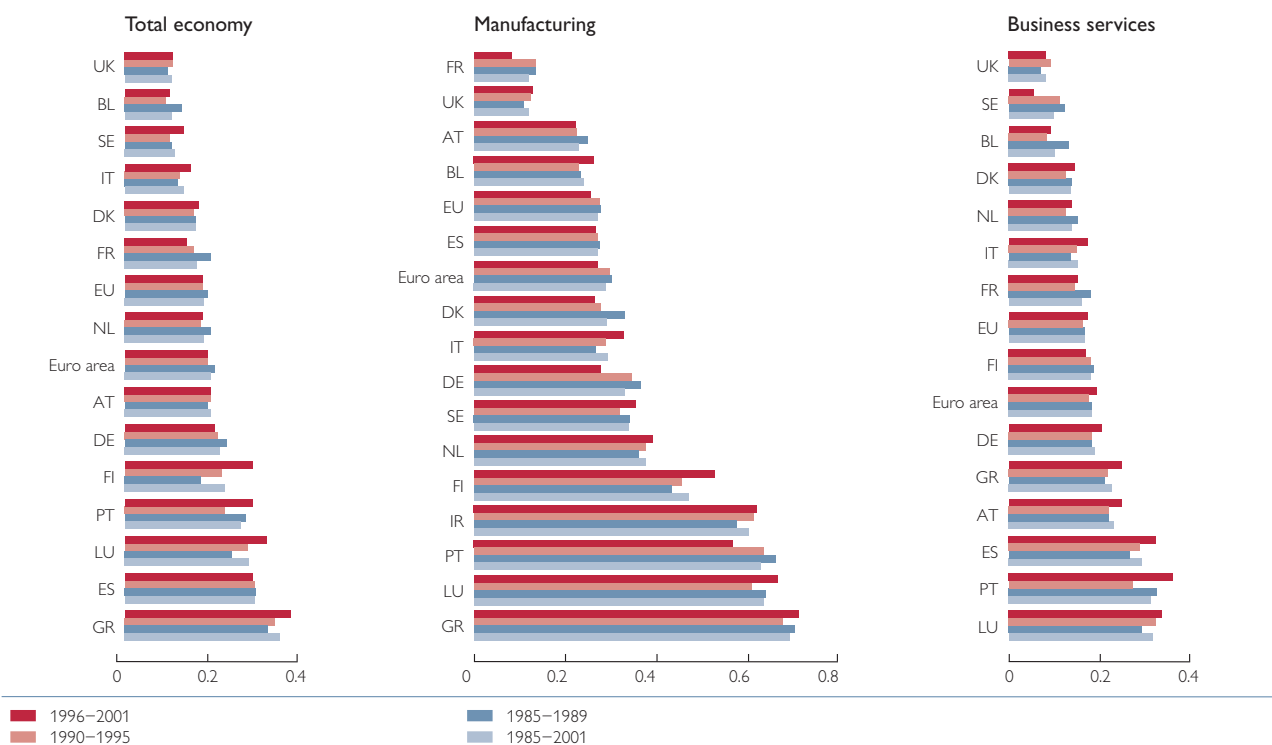
Measured by CR3, CR5 and Herfindahl indicators,<sup>3</sup> the absolute sectoral specialization of the Austrian

economy (or the Austrian manufacturing industry) has in fact not changed significantly since 1980. This

<sup>3</sup> The CR3 and CR5 indicators refer to the share of the three and five, respectively, largest sectors in gross value added. The Herfindahl indicator calculates the sum of the individual sectors' squared shares in gross value added. The closer the indicator is to 1, the higher the degree of specialization.



Chart 3

**Krugman Specialization Index**


Source: OECD, Eurostat, ECB calculations.

presentation, however, masks the – in some cases considerable – shifts in individual sectors' shares in value added.

### 2.1.3 Specialization by Employment Reflects Divergent Sectoral Productivity Growth Rates

In terms of employment, the Austrian economy is characterized by a large services sector and the predominance of small and medium-sized enterprises (SMEs). In 2002, 83.7% of businesses employed 1 to 9 people, 13.2% employed 10 to 49 people. In other words, some 97% of enterprises employ a staff of less than 50, and only 0.4% of Austrian businesses have more than 300 employees. All in all, the primary sector accounted for 0.8% of payroll employment and contributed 2.25% to GDP in 2002. By comparison, 28.7% of all employees worked in the secondary sec-

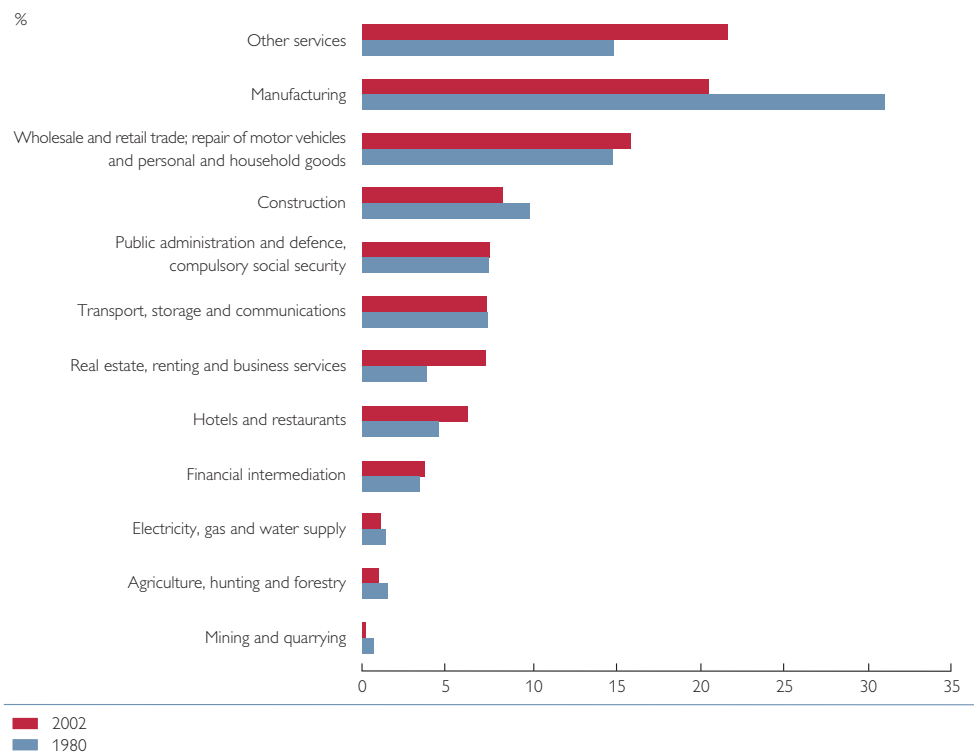
tor (contribution to GDP: 30.45%), and 70.4% in the tertiary sector (contribution to GDP: 62.4%). Between 1995 and 2002 a marked shift took place from the secondary sector (–6.8%) toward the tertiary sector (+7.8%). The biggest growth industries were real estate, renting and business services (+50.4%), health (+22.6%) and other community, social and personal service activities (+20.6%).

The change in absolute shares in employment also mirrors the divergent productivity growth across sectors. While the manufacturing sector's share in value added contracted only slightly, its share in employment dropped by a significant 10 percentage points.

Labor productivity in manufacturing increased twice as rapidly, on average, as productivity in services

Chart 4

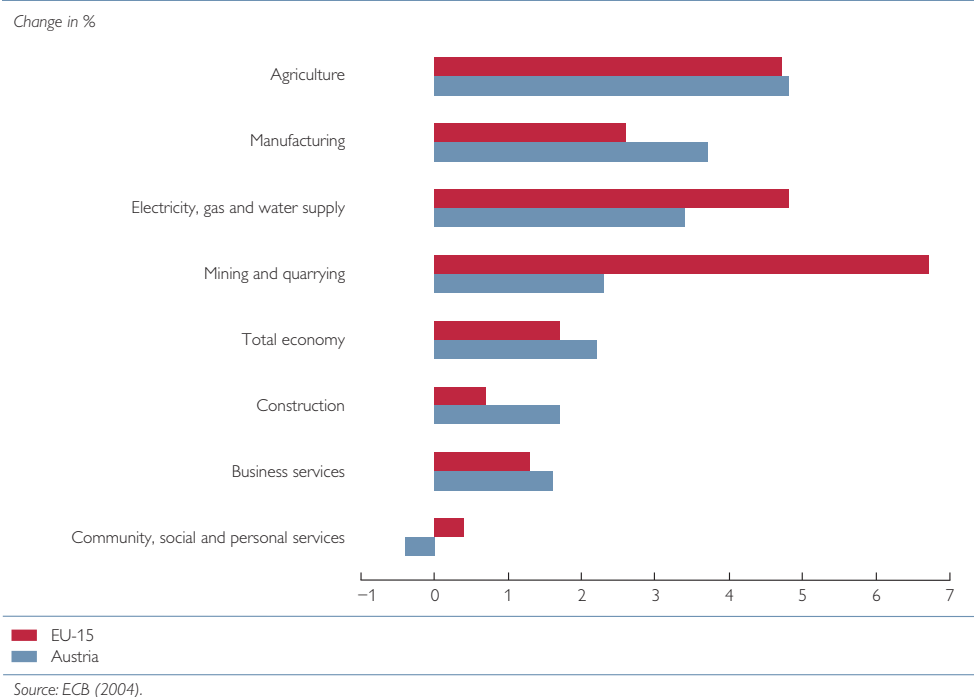
**Change in Sectoral Shares in Total Employment from 1980 to 2002**



Source: OeNB, Statistics Austria.

Chart 5

**Labor Productivity Growth from 1985 to 2001**



Source: ECB (2004).

(leaving aside mining and quarrying, electricity, gas and water supply accounted for the sharpest rise across Europe over the past two decades). These figures seem to confirm, at least for the EU-15, Baumol's hypothesis (1967) of a structurally lower productivity growth potential in the service sector.<sup>4</sup>

#### 2.1.4 Start-up Boom since Mid-1990s

The sectoral distribution of business start-ups is a leading indicator of specialization. What is most striking about the shifts in start-up activities over the past decades is the decline in manufacturing, the stagnation in the service sectors wholesale and retail trade, tourism, transport and communications as well as the increase recorded in financial intermediation and business services (table 4), which has been particularly strong since 2000.

Since 1980 a total of 148,956 new firms were established in Austria; a genuine start-up boom has been observed since the mid-1990s. While prior to 1996 some 15,000 firms were set up every year, the annual average totaled approximately 23,300 between 1996 and 2003. In 2003 business start-ups reached a new record high at more than 28,200 (+9.3% compared with 2002) – a remarkable increase given the prevailing weak economic conditions. However, this figure should be seen against the backdrop that it also includes the group of self-employed termed “new self-employed” (neue Selbstständige), a type of self-employment introduced in January 1998. The sharp rise in start-ups<sup>5</sup> (from 5.8% in 1993 to 8.9% in 2003) has been largely carried by unincorporated sole proprietors.

Table 4

### Start-Up Activities in Austria in the 20<sup>th</sup> Century

	A+B Agriculture, hunting and forestry, fishing	C+D+E Industry, including energy	F Construction	G+H+I Wholesale and retail trade, repair of motor vehicles and household goods, hotels and restaurants; transport and communications	J+K Financial inter- mediation, real estate, renting and business services	L-P Other service activities	Q Services provided by extra-territorial organizations and bodies	Start-ups	
	Share in % of start-ups in the respective sector							Total	as a percentage of total number of enterprises
NACE code	1–5	10–41	45	50–64	65–74	75–95	99		
until 1900	0.6	13.0	1.3	33.7	50.8	0.5	0.0	970	0.5
1961–1969	0.3	21.0	10.3	49.4	16.4	2.6	0.0	3,958	2.2
1970–1979	0.3	16.8	11.6	42.3	26.8	2.2	0.0	15,827	9.0
1980–1989	0.3	13.9	9.6	45.4	27.6	3.2	0.0	30,270	17.2
1990–1999	0.5	10.0	9.6	43.9	30.7	5.3	0.0	87,565	49.6
2000–2002	0.7	7.5	9.5	33.2	44.5	4.6	0.0	31,121	17.6
Total number	948	20,535	16,916	74,905	55,518	7,625	5	176,452	
Total percentage	0.5	11.6	9.6	42.5	31.5	4.3	0.0		

Source: OeNB.

<sup>4</sup> By comparison, the high productivity growth the U.S.A. has seen over the past few years is to some extent attributable to increasing productivity growth in some service sectors (van Ark et al., 2003).

<sup>5</sup> Start-up ratio = number of start-ups as a percentage of active members of the Economic Chamber.

## 2.2 Determinants of Sectoral Specialization

Theory is ambiguous about the determinants of sectoral specialization. There is no clear evidence that the growing integration of product and factor markets triggered by the EU has unleashed an obvious trend towards increasing or decreasing specialization. While traditional trade theory holds that stepped-up trade fosters specialization, new trade theory (incomplete competition due to returns to scale) sees a convergence of production structures. New economic geography stipulates that the agglomeration or dispersion of economic activity hinges on the level of trading costs: economic integration reduces transport costs, barriers to labor mobility and transaction costs.<sup>6</sup>

In an econometric investigation, Midelfart et al. (2000) find that, in general, growing economic integration in tandem with declining economic policy intervention at the national level cause sectoral specialization or the choice of production sites to be increasingly driven by market forces (e.g. competition in the product markets). Furthermore, industries that depend on tight supplier and customer relations (e.g. because of high transport costs) tend to settle close to economic hubs. In high-technology sectors, specialization clearly depends on the availability of adequately qualified labor. Taking into account these findings, in the following we will investigate to what extent competition, EU accession and EU enlargement promote agglomeration and look at the role of Austria's human resources in the process of specialization. In addition, we will illustrate develop-

ments in national sectoral aid policies, sectoral regulation, foreign direct investment (FDI) and sectoral capital ratios.

### 2.2.1 EU Accession Has Enhanced Competition

Competition, promoted under the frameworks of the World Trade Organization (WTO) and the EU, has fueled structural change, i.e. a shift towards more technology-intensive industries, also in Austria, albeit – as mentioned above – at a comparatively slower pace. As expected, Austria's accession to the EU in 1995 increased competition in certain sectors, which also impacted considerably on price developments. After the Austrian economy's competitiveness had declined due to exchange rate developments in the early 1990s, it started to improve in mid-1995 (Hahn et al., 2001). In other sectors, however, there is no clear evidence of a structural break, with the exception of motor vehicle and parts manufacturing, whose positive development can be traced to an ambitious regional policy and to major corporate relocations. Although the shift away from the clothing and food industries started already before EU accession, it may have been accelerated by the latter.

Another aspect of economic integration is financial integration among the EU Member States, which entails the possibility of cross-border risk diversification and thus may also foster sectoral specialization. This facilitates the full utilization of comparative advantages (Kalemi-Ozcan et al., 2003). Yet, empirical studies show that despite increased economic inte-

<sup>6</sup> For a comprehensive outline of determinants of sectoral specialization in theory, see Wolfmayr-Schnitzer (1999).

gration, risk diversification in the euro area has not improved significantly so far.<sup>7</sup>

### 2.2.2 Austrian Industry Feels Demand Effects Caused by Transition and EU Enlargement

The opening up of Eastern Europe has triggered long-term demand effects in Austria's industrial sector; Austria's moving to the center of the EU may bring about positive agglomeration effects (i.e. an increase in business relocations). In terms of external trade and foreign direct investment (FDI), Austria has the closest ties with the new EU Member States in Central and Eastern Europe. In 2003, the Central and Eastern European countries absorbed 45% of Austria's outward FDI, with banks remaining a key force in the internationalization of Austrian business. Austria's neighbors Hungary, Slovenia, the Czech Republic, the Slovak Republic and Poland account for some 12% of Austria's exports.

A number of studies (e.g. Aiginger et al., 1993) point out that the effects of transition vary considerably across economic sectors in Austria and provide estimations of indirect effects (Luptáčík and Wagner, 1998). These effects, however, are mostly of a long-term nature. An examination by Wolfmayr-Schnitzer (2004) identifies positive effects for the manufacturers of machinery, medical, precision and optical instruments as well as leather, and fairly positive effects for the chemicals sector, communications equipment as well as publishing and printing. By contrast, the textiles and textile products, construction material, wood and wood products as well as metal industries face a more difficult competitive situation. Given its

overall positive foreign trade balance, the wood and wood products sector may benefit from intermediate input from the neighboring countries.

### 2.2.3 Austrian State Aid Focused on Horizontal Measures

For Austria, there are no comprehensive analyses of measures specifically designed to support certain industries. State aid policies have mostly been analyzed from a horizontal perspective (R&D measures, etc.). Still, according to the European Commission's State Aid Monitor, sectoral subsidies account for just about 11% of total state subsidies in Austria, whereas the lion's share is used to finance horizontal measures (R&D, environmental measures, SME promotion, education). At 1.1% of GDP, Austria's state aid ratio was below the EU average in 2002 and has also been going down in absolute figures.

What these figures conceal, however, is the effect regional subsidies, which up to a point are geared to specific industries. For instance, the success of Austrian car component suppliers has been made possible, among other things, by the proactive cluster policy pursued by two regional governments: the automobile clusters of Styria and Upper Austria have developed into large networks of businesses. Likewise, Vienna's biotechnology cluster (pharmaceutical industry) has grown strongly in recent years, not only in terms of research activities but also in terms of turnover. The regional governments support these initiatives not only financially, but also in organizational matters (e.g. in initiating or organizing networks).

An analysis of federal government subsidies granted between 1989 and

<sup>7</sup> See, e.g., Moser, Pointner and Scharler (2003).

2002 shows that throughout the reporting period, hotels and restaurants, the chemicals sector as well as manufacturers of machinery and transport equipment received the highest subsidies. Again, these figures mask a shift in the focus of subsidies that occurred after Austria's accession to the EU: After 1996 manufacturers of radio, television and communication equipment as well as manufacturers of metal products and research

institutions received a comparatively larger share of subsidiaries. Consequently, the above-average growth recorded by tourism is not only traceable to higher demand (fostered by rising incomes) and Austria's attractiveness as a holiday destination, but also to large-scale state subsidies. It would be desirable that in the future, a larger share of subsidies be spent on knowledge-intensive services.

Table 5

Branche	Sector-Specific State Aid from 1989 to 2002			
	Present value 1989–2002 EUR million	1989–2002 Share in %	1989–1995	1996–2002
55 Hotels and restaurants	383	8.0	10.3	5.8
24 Chemicals and chemical products	377	7.8	9.4	6.4
29 Machinery and equipment n.e.c.	340	7.1	7.9	6.3
34 Motor vehicles, trailers and semi-trailers	317	6.6	8.4	4.9
32 Radio, television and communication equipment and apparatus	295	6.1	5.5	6.7
28 Fabricated metal products, except machinery and equipment	282	5.9	5.2	6.6
20 Wood and products of wood and cork	247	5.1	4.1	6.2
26 Other nonmetallic mineral products	212	4.4	4.9	3.9
27 Basic metals	201	4.2	4.7	3.7
73 Research and development services	201	4.2	2.1	6.2
33 Medical, precision and optical instruments, watches and clocks	174	3.6	3.4	3.7
15 Food products and beverages	161	3.3	2.5	4.0
40 Electricity, gas, steam and hot water supply	158	3.3	3.6	3.1
25 Rubber and plastic products	154	3.2	2.6	3.8
21 Pulp, paper and paper products	135	2.8	3.1	2.5
31 Electrical machinery and apparatus n.e.c.	114	2.4	2.4	2.4
72 Computer and related services	108	2.2	1.4	3.1
45 Construction	103	2.1	2.0	2.3
22 Publishing, printing and reproduction of recorded media	90	1.9	2.3	1.5
51 52 Wholesale trade and commission trade services	88	1.8	2.0	1.6
17 Textiles	80	1.7	1.8	1.5
74 Other business services	72	1.5	1.0	1.9
60 Land transport and transport via pipeline services	68	1.4	1.6	1.2
90 Sewage and refuse disposal services	56	1.2	1.4	1.0
36 Furniture; manufacturing n.e.c.	53	1.1	1.3	0.9
70 Real estate services	50	1.0	0.0	2.0
35 Other transport equipment	37	0.8	0.6	0.9
50 Sale, maintenance, repair of motor vehicles and motorcycles	34	0.7	0.7	0.7
93 Other services	23	0.5	0.6	0.4
37 Recycling	17	0.4	0.2	0.4
Total	4,810	x	x	x

Source: Finkard data base, Federal Chancellery.

#### 2.2.4 Is a Lack of University Graduates an Obstacle to Specialization in Knowledge-Based Sectors?

Compared with other EU countries, the share of university graduates in Austria is relatively small, even if graduates of secondary technical colleges (“HTL”) are factored in. In Aus-

tria, only 0.7% of 20- to 29-year-olds hold a tertiary degree in science or engineering, against 2.3% in Ireland, 2% in France and 1.6% each in the United Kingdom and Finland (Walterskirchen, 2004). The use of new technologies and, as a consequence, the growth of certain economic sec-

tors, entail a rising demand for adequately qualified workers, as we have seen from the diffusion of the new information and communication technologies (Falk, 2004). A lack of highly qualified workers in these areas implies that in Austria sectoral specialization will remain limited to medium technology industries (chapter 3).

### 2.2.5 Sectoral Regulation: Significant Progress in Recent Years

Triggered by the liberalization of the telecommunications industry and, subsequently, other network industries, sector regulation has changed significantly over the past few years.

According to calculations by the Austrian Institute of Economic Research (WIFO), deregulation significantly dampened electricity prices for corporate customers (by 35%) and for households (by 13%). By international standards, this decline was more pronounced than in comparable EU countries. The liberalization of the natural gas market in October 2002 also led to substantial falls in prices. In addition, liberalization in the telecommunications sector increased the market share of alternative providers at the expense of (formerly) state-owned providers.

This process of liberalization took place in all EU countries, however; thus, it may not have impacted severely on sectoral specialization, except in cases where it prompted large-scale concentration. In some northern European countries like Ireland, Finland and – to a lesser degree – in Sweden, the information and communication technology industry expanded at an above-average rate (e.g. Nokia, Ericsson).

The crisis that hit the Austrian nationalized industries in the 1980s caused government influence in these industries to become even bigger and prompted a host of labor market policy measures for the workers concerned (e.g. the introduction of a re-employment scheme for steel workers, the so-called “steel foundation”). More recently, new forms of employment (contract self-employment, marginal employment, contract employment, “new self-employed”) have emerged that have provided some positive employment impetus in certain sectors (e.g. in the retail trade). Finally, the admission of seasonal workers in agriculture and tourism has driven up temporary employment of foreigners from 1997 on; since 2002, businesses in all sectors are permitted to employ seasonal workers.

Hall and Soskice (2001) describe the possible interaction between sectoral specialization and regulation in labor, product and financial markets. The regulation of uncoordinated market economies (e.g. the U.S.A. or the United Kingdom) facilitates radical innovation, whereas regulation in coordinated market economies (e.g. Germany or Austria) supports incremental innovation. Put differently, the Austrian type of coordinated market economy promotes specialization in sectors that feature incremental innovation, e.g. manufacturing of motor vehicle parts.

### 2.2.6 Companies Improve Capital Adequacy Ratios

The growth potential of all sectors, not only high-tech sectors, hinges, inter alia, on national and international<sup>8</sup> financing options. In addition,

<sup>8</sup> Over recent years, the role of external funding has increased considerably. Between 1999 and 2003, the share of foreign loans in total loans rose from 4.8% to 10.5% (OeNB, Financial Stability Report 7).

companies' financing structures determine to what extent potential changes in the framework conditions induced by cyclical or financial market developments impact on corporate finance. Sectors featuring radical innovation (e.g. consumer software such as operating systems) have to rely on external, capital market-based fund-

ing sources, since they are forced to redevelop their products within short periods of time, which involves substantial risk without any guarantees of financial return. By contrast, sectors featuring incremental innovation (e.g. custom-made machinery) benefit from stable funding sources such as bank loans (Hall and Soskice, 2001).

Table 6

Indicators of Austrian Companies' Financing Structure							
	1999	2000	2001	2001			
	Capital ratio			Bank debt ratio	Cash flow in % of sales	Cash flow in % of debt	Cash flow in % of investment
	%						
Agriculture, hunting and forestry	3.36	5.74	1.43	68.6	9.4	12.8	146.2
Mining and quarrying	14.89	16.84	11.07	44.9	11.5	14.2	106.9
Manufacturing	10.23	13.6	11.14	47.6	7.1	13.0	166.7
Electricity, gas and water supply	22.28	25.15	33.62	12.6	16.1	15.3	143.2
Construction	4.8	7.06	6.86	42.5	5.8	10.5	178.3
Wholesale and retail trade; repair of motor vehicles and personal and household goods	4.14	6.56	5.88	47.7	4.2	10.9	235.4
Hotels and restaurants	-24.09	-21.03	-20.85	90.7	12.8	10.8	230.1
Transport and communications	2.37	3.78	3.81	53.2	8.9	15.1	122.8
Real estate, renting and business activities	8.15	10.22	10.56	33.3	10.5	17.1	201.3

Source: OeNB.

Austria's sectoral financing pattern tends to encourage incremental innovation. The share of bank lending (62.9% in 2003) in corporate finance continues to be high compared with other European countries. Austrian companies have, however, considerably improved their capital adequacy ratios in recent years, reflecting a rising degree of internationalization and integration but also a shift in business promotion schemes from subsidizing loans<sup>9</sup> to making equity financing more attractive. Foreign portfolio and direct investment contributed significantly to this development.

A breakdown by industrial sector reveals that the capital ratio has grown sharply in all industries, but differs considerably across industries – be-

tween 3.8% of total assets (transport, storage and communications) and 33.6% (electricity, gas and water supply) in 2001. Hotels and restaurants continued to report a negative capital ratio (-20.9%).

More detailed information can be provided at the NACE two-digit level: At 33.3% and 27.4% of total assets, energy suppliers and the radio, television and communications equipment sector posted the highest capital ratios, whereas the retail trade reported a mere 0.01%.

Debt capital has typically been raised through bank loans. Bank financing is of particular relevance for small and medium-sized companies, which dominate Austria's business structure. The bank liabilities of small

<sup>9</sup> For a long time, subsidizing debt financing, for instance through subsidized loans, was the top priority. Over time, the volume of subsidized loans has, however, contracted strongly. In 2002, a mere 4.8% of all loans (excluding housing loans) were subsidized.



businesses (with a turnover of up to EUR 1 million) in manufacturing came to 69.4% of total assets, those of large businesses to no more than 23.3% to 30.2%. At 90.7% of total assets, hotels and restaurants accounted for the largest share of bank liabilities. By contrast, electricity, gas and water supply recorded the smallest share of bank liabilities, while having the highest capital ratio. At the NACE two-digit level, the food industry (65.8%) and the manufacture of furniture (68.2%) posted the highest levels of bank liabilities, whereas the bank liabilities of the car industry, chemicals manufacturers and mining and quarrying were lowest at some 30% of total assets.

Throughout all sectors, cash flow is smaller the larger a company. Real estate (17.1%), electricity, gas and water supply (15.3%) as well as transport and communications (15.1%) recorded the best cash flow-to-debt ratios. As to company size, an interesting trend has been observed in construction: the cash flow-to-debt ratio declines in proportion to increasing company turnover. Companies posting a turnover of EUR 1 million recorded a cash flow-to-debt ratio of 12.4%, while companies whose turnover exceeded EUR 100 million posted 5.5%. Similarly, the cash flow-to-debt ratio decreases – albeit at a slower pace – in proportion to increasing turnover also in the retail sector (from 12.4% to 10%).

### 2.2.7 Austrian Businesses Stepped Up Foreign Direct Investment

Inward and outward foreign direct investment (FDI) plays a crucial role in sectoral specialization in Austria. While the former enhances, e.g., pro-

duction capacity or efficiency through material investment and, in particular, through management and technology transfer, the latter may stimulate growth and boost investors' competitiveness in Austria (as, for instance, cheaper input goods reduce production costs in Austria).<sup>10</sup>

Austria's overall FDI position improved in the 1990s compared with the 1980s. Austria increased its share in outward FDI flows from industrialized countries, from 0.3% on average in the 1980s to 0.6% in the 1990s. At the same time its share of *inward* FDI augmented from 0.4% to about 1%. Austria evidently benefited from EU accession (with regard to inward FDI) and from the opening up of Eastern Europe (with regard to outward FDI). However, Austria's FDI-to-GDP ratio continues to be far below the European average.

In 2003, *outward FDI* reached an all-time high of EUR 6.3 billion. At the same time, *inward FDI* to the tune of EUR 6.1 billion confirmed that the slump of 2002 was only of a temporary nature. On balance, 2003 saw the continuation of the trend of 2002, when outward FDI surpassed inward FDI for the first time since the early 1990s and, consequently, the direct investment gap narrowed significantly.

The sectoral distribution of outward and inward FDI in Austria results in the following specialization pattern: The financial sector – in particular real estate activities and business services (especially increased investment in real estate and business consulting services) as well as financial intermediation – accounts for the lion's share in outward FDI. More than a quarter of total outward FDI

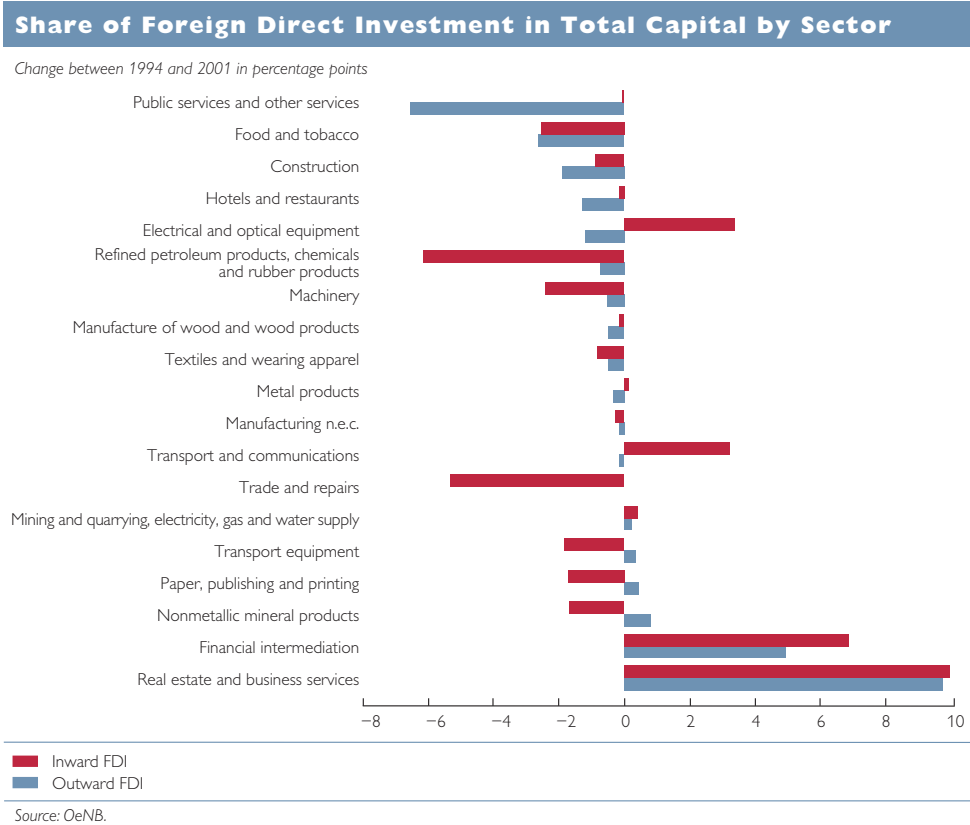
<sup>10</sup> Wolfmayr-Schnitzer (1999) provides an overview of possible interrelations.

Table 7

	Outward FDI			Inward FDI		
	1994	2000	2001	1994	2000	2001
	Share in total capital in %					
Mining and quarrying, electricity, gas and water supply	2.8	1.2	3.0	0.5	1.0	0.9
Food, beverages and tobacco	3.9	1.8	1.4	4.3	2.0	1.8
Textiles and wearing apparel	0.7	0.3	0.3	1.5	0.8	0.7
Manufacture of wood and wood products	1.1	0.9	0.6	0.3	0.2	0.1
Paper, publishing and printing	1.8	2.0	2.2	4.0	2.5	2.3
Refined petroleum products, chemicals and rubber products	6.6	4.5	5.8	12.2	7.3	6.1
Nonmetallic mineral products	3.3	4.3	4.1	3.1	1.4	1.4
Metal products	4.7	4.9	4.3	1.4	1.7	1.6
Machinery	2.2	1.8	1.7	4.7	2.8	2.3
Electrical and optical equipment	3.9	2.6	2.7	4.2	7.0	7.6
Transport equipment	0.4	0.4	0.7	3.1	1.3	1.3
Manufacturing n.e.c.	0.4	0.3	0.2	0.5	0.3	0.2
Construction	3.7	1.5	1.8	1.0	0.2	0.1
Trade and repairs	12.5	12.0	12.5	21.5	19.4	16.2
Hotels and restaurants	1.6	0.9	0.3	0.9	0.8	0.7
Transport and communications	0.7	0.3	0.5	1.4	5.4	4.6
Financial intermediation	18.0	20.9	22.9	10.0	17.9	16.7
Real estate, renting and business activities	24.9	38.1	34.5	25.3	27.8	35.1
Public and other services	6.9	1.0	0.4	0.3	0.2	0.3
	<i>EUR billion</i>					
Total	7,671.3	26,674.5	32,350.7	11,801.2	32,704.3	38,952.3

Source: OeNB.

Chart 6



is attributable to Austrian banks' stepped-up activities abroad. In addition, foreign investors have continued to expand their holdings in third countries through their Austrian subsidiaries.

As to inward FDI, the chemicals sector as well as retail and wholesale trade, but also manufacturers of machinery and the food industry recorded a substantial decline in investment between 1994 and 2001, whereas financial services and manufacturers of electrical machinery and apparatus attracted increasing investment from abroad.

On the whole, the impact of rising outward FDI on specialization patterns in Austria can only be assessed on the basis of data covering longer periods of time.

### 3 Sectoral Specialization and Long-Term Growth

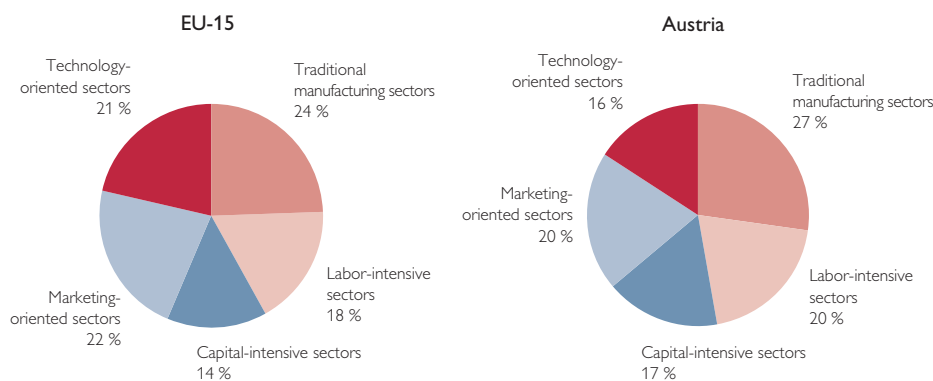
Sectoral specialization patterns have an effect on an economy's long-term growth. From 1960 to 2002, annual per capita income growth averaged 2.75% in Austria, thus climbing at a faster pace than the euro area average of 2.5%. Since the early 1980s, however, the average growth rate has

dropped to 1.95% (Gnan et al., 2004). Despite these above-average growth rates, Austria continues to be specialized in industries at a medium technology level (Peneder, 2001: structure-performance paradox). Although the R&D share of GDP has been revised upwards (2.27%), the most recent data available (from the year 2000) show that compared with the EU, in Austria, labor-intensive industries contribute more to value added (20%, EU: 18%) than technology-oriented industries (16%, EU: 21%).

A comparison of the EU-15 with the U.S.A. shows that in terms of productivity growth, which is key to long-term growth, the EU has been lagging behind the U.S.A. since the mid-1990s. At the sectoral level, this gap is attributable to the U.S.A.'s higher productivity growth in the information and communication technology manufacturing sector and, in particular, in the three service sectors retail and wholesale trade as well as financial services (van Ark et al., 2003). In the EU-15, it is higher productivity in the individual industries that contributes to productivity growth rather than shifts to sectors

Chart 7

#### Specialization in Manufacturing in 2000



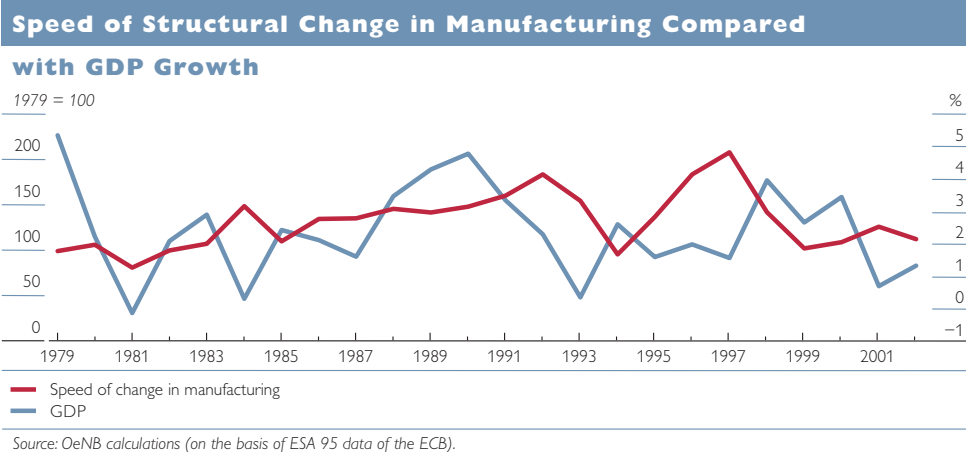
Source: WIFO, WIFO Taxonomie der Sachgütererzeugung, Eurostat SBS.

with above-average productivity rates. Above all in the service sectors of the individual EU countries, however, shifts to more productive sectors account for almost half of total productivity growth. Therefore, the conclusion drawn in ECB (2004) is that Europe still has potential for productivity-enhancing structural change.

How quickly did manufacturing in Austria undergo the structural changes mentioned above? To assess the relationship between aggregate economic development and structural

change in the production system, an indicator of the speed of structural change at the NACE two-digit level can be used.<sup>11</sup> We find the speed-of-change indicator to be out of sync with the business cycle, which implies that individual manufacturing sectors saw developments that differed significantly from the macroeconomic cycle. Moreover, it becomes obvious that prior to 1995 the speed of change lagged behind GDP growth, whereas after 1995 it was a kind of leading indicator of GDP growth.

Chart 8



#### 4 Summary and Conclusions

Sectoral specialization patterns in Austria and the EU-15 have been changing only slowly and more or less homogeneously over the past 20 years. Only a few EU countries saw increasing specialization in high-technology industries. This development proves that owing to the relatively homogeneous production structure, the risk of asymmetric shocks in the euro area is generally low. Neither is there a danger that sectoral specialization would be high enough for Austria to slip into a business cycle that would not be in line with the single mone-

tary policy, since Austria's economic structure is very similar to that of the euro area.

An analysis of developments in the ESCB (ECB, 2004) has shown that cyclical divergences and inflation differentials within the euro area narrowed in the course of the 1990s, to some extent driven by sectors exposed to external trade, which – as described above – are of roughly equal size throughout the euro area. This may indicate that an optimum currency area like Austria and Germany can be the result of, rather than the precondition for, monetary union. In any case, the convergence of business

<sup>11</sup> The indicator calculates the sum of all changes in sector shares in total manufacturing.

cycles, homogeneous production structures and the relatively slow change of sectoral specialization patterns are factors that create a favorable climate for conducting the single monetary policy.

No (or only a gradual) increase in specialization does not imply, however, that an economy is not undergoing structural change. Comparing specialization on an international scale conceals the fact that there have been significant concomitant shifts in the contribution to value added between sectors, in particular gains in services (especially business services). In addition, motor vehicle and parts manufacturers markedly increased their share in value added in Austria. Compared with the EU average and considering Austria's high per capita GDP, the domestic economic structure is still lagging behind in terms of technology and knowledge intensity. Measures to promote structural

change towards knowledge-intensive businesses are still warranted, in particular against the background of EU enlargement and the subsequent increased sectoral heterogeneity in the EU (Peneder et al., 2001; Gnan et al., 2004). One priority should therefore be the promotion of tertiary education.

Growth-enhancing structural change does not necessarily lead to higher levels of specialization and, consequently, to more heterogeneous economic structures in the euro area; if all euro area countries develop along similar lines, as past experience suggests, growth and homogeneous conditions for the single monetary policy are not mutually exclusive. The Lisbon strategy is an economic policy instrument that supports EU-wide structural change, provided that all Member States vigorously pursue its implementation.

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# The Role of Revaluation and Adjustment Factors in Pay-As-You-Go Pension Systems

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*This study examines the role of revaluation and adjustment factors in pension systems. The first part sheds light on the determination of revaluation and adjustment factors according to the General Social Security Act (Allgemeines Sozialversicherungsgesetz – ASVG) and how these factors have evolved over time. The analysis shows that since the mid-1980s the revaluation factors have been set more or less in line with the inflation rate; in other words, contributions have not, in fact, been revalued in real terms.*

*The author then demonstrates that such a system eventually conflicts with principles of intragenerational and intergenerational fairness. In such case, the mere extension of the assessment period may entail substantial reductions in pension benefits. When we consider the Austrian situation, extending the assessment period from 15 to 40 years may cause the average pension to drop by 11% to 36% (depending on the underlying assumptions). Capping maximum losses at 10% certainly is a solution for persons aged 35+ at the cutoff date, but anyone younger than that would have to bear the brunt of such a pension reform measure. In the light of the problematic fairness aspects of the current revaluation regime, relating the necessary reform of the Austrian pension system and the concomitant paring of benefits too closely to the effects of this revaluation regime does not seem to be the right approach. In a new (harmonized) system, the revaluation factors should at any rate be linked to wage growth.*

*The last section of this paper focuses on issues which are crucial in wage-based revaluation regimes and which are mainly related to the emergence of demographic shifts. Some of the questions tackled are: Should revaluation be based on the growth rate of average earnings or of the total wage bill? Is the 80-45-65 formula frequently cited in the pension reform debate in Austria consistent in itself? Should automatic adjustment factors (sustainability factors) be built into the pension system, and if so, which ones? Does it make any difference then whether we are dealing with a traditional pay-as-you-go pension model or a notional account system?*

## I Introduction

The political and public debate of the past few months revolved to a considerable degree around the Austrian pension reform adopted in 2003 and the forthcoming harmonization of pension systems. The intensity of the debate also reflects the significance of the old-age provision (sub)system under the General Social Security Act (Allgemeines Sozialversicherungsgesetz – ASVG). As it is nearly impossible to explore all the intricacies of the pension system and conceivable reform measures in a short paper, this study deals only with one particular aspect and explores it from the perspective of fiscal solidity and structural solidarity (intra- and intergenerational fairness).

The focus is on issues of revaluation and adjustment. At first glance,

this may seem to be an insignificant aspect, but upon closer inspection, we see that revaluation and adjustment are crucial to any pay-as-you-go pension system. When compared to marketable financial products, the revaluation factor would essentially correspond to the interest on contributions and the adjustment factors to the indexing of annuities, both central provisions of the respective contracts.

Chapter 2 sheds light on the determination of revaluation and adjustment factors according to the ASVG and how these factors have evolved over time.

Chapter 3 then continues to explore in how far such a system conflicts with principles of intragenerational and intergenerational fairness. Furthermore, we see that the mere extension of the assessment period may

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entail substantial reductions in pension benefits. Chapter 4 is dedicated to the quantification of these effects within a framework reflecting the Austrian situation. In the light of the problematic fairness aspects of the current regime, in an overhauled system the factors of revaluation should follow the growth rate of wages.

Chapter 5 highlights issues which are relevant for wage-based revaluation and which should be taken into account in a new system. Among others, the following questions are tackled: Should the growth rate of the average wage or of the total wage bill be used for revaluation purposes? Is the 80-45-65 formula frequently cited in the Austrian pension reform debate (80% replacement rate at the age of 65 following 45 years of contributory service) consistent in itself? Should automatic adjustment factors be built into the pension system, and if so, which ones?

The results are summarized in the final chapter.

## 2 Revaluation and Adjustment in Austria

### 2.1 Definitions

According to Austrian pension law, a person's initial pension benefit, i.e. the benefit as at the time of retirement, is determined as follows:

$$\text{initial pension} = \text{accrual rate} \times \text{pension assessment base} \quad (1).$$

The accrual rate essentially depends on a person's employment history (e.g. period of actual and credited service, premiums and discounts depending on the actual retirement age); under the statutory scheme provided for by the ASVG, it amounts to 80% for the "benchmark" pensioner. The assessment base corresponds to the revalued annual earnings averaged out over the assessment period. The

assessment period (AP) reflects how many of the "best" earnings figures are used to calculate the pension benefits, and the revaluation factors determine how past earnings are translated into current purchasing power units. Such adjustment is necessary because otherwise the relative amount (i.e. the "relative real income sacrifice") of contributions made a long time ago would be grossly undervalued. For this reason, it is often argued that the adjustment of previous annual earnings should be linked to wage growth.

Current pensions are adjusted as follows on an annual basis:

$$\text{pension} = \text{pension of the previous period} \times \text{adjustment factor} \quad (2).$$

In most countries, the adjustment factor equals the inflation rate or nominal wage growth.

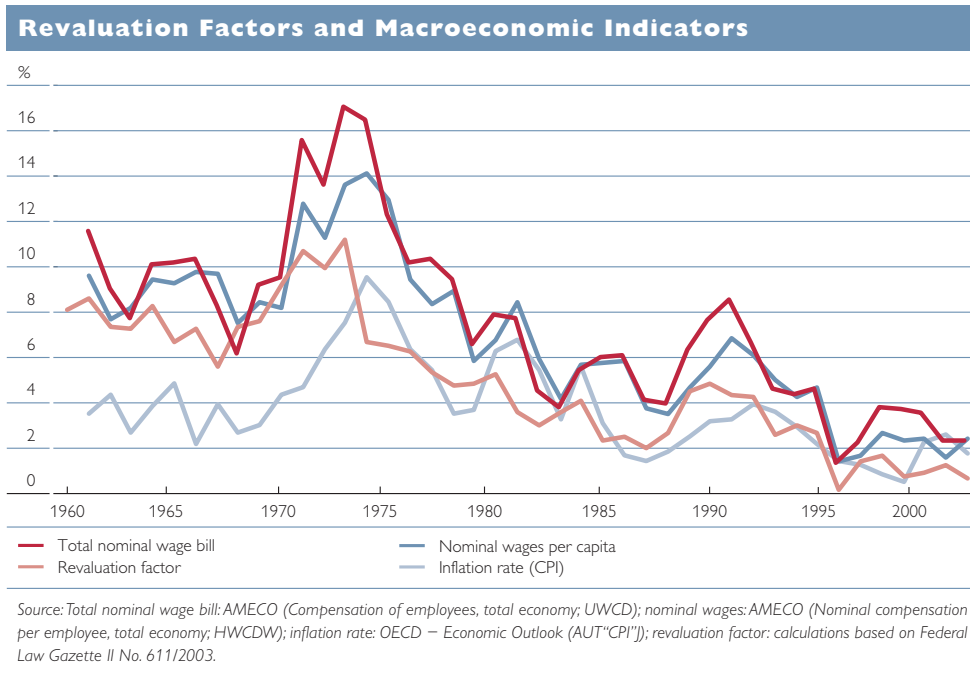
### 2.2 Revaluation Factor Developments of the Past Decades

As is evident from chart 1, the annual revaluation factor falls short of the growth rate of the total nominal wage bill or the per capita nominal wages nearly every year. At the same time, we see that the revaluation factors and the inflation rate have been developing almost in sync since the mid-1980s. In other words, past annual earnings are not adjusted at all for productivity gains or real economic growth.

When we look at the annual gaps of the revaluation factors, the differences seem to be minor. The effect of compound interest mounts up over the years, however, causing small amounts to increase substantially. Table 1 highlights that the current scheme leads to considerable cumulative effects. While the average nominal total wage bill has increased almost



Chart 1



twentyfold since 1960 and more than eightfold since 1970, annual earnings of those years are revalued merely by a factor of 6.65 and 3.29, respectively. Even for the relatively short period since 1990 the cumulative effects of incomplete revaluation are quite substantial. Again, we find that the cumulated revaluation factor (123.7) is close to the cumulated inflation factor (130.87) and that, on the other hand, real gains are left completely unaccounted for.

This gross disparity is ascribable to the legal provisions laid down in paragraph 108 of the Austrian Social Security Act, according to which existing pensions must be adjusted such that the average net pension grows at about the same pace as average net annual

earnings. However, the average net pension also increases when current pension payouts remain unadjusted because every year some of the (relatively low) pensions expire whereas (relatively high) new pension payouts become effective. This structural effect was estimated to amount to 1% to 2% per year. In a somewhat illogical move, the amount of the revaluation factors was linked to these adjustment factors (with a time lag), causing the revaluation factors to systematically lag behind wage increases. At the same time, this coupling mechanism results in a recursive, dynamic system since the assessment bases of the (distant) future are likely to be smaller given incomplete revaluation. Initial pensions are therefore likely to be lowered as

Table 1

Cumulated Effects until 2002				
Base year (= 100)	Revaluation factor	Total nominal wage bill	Nominal wages per capita	Inflation rate
1960	664.5	1,959.19	1,443.75	479.07
1970	328.8	818.36	635.05	337.03
1980	168.4	266.87	241.88	184.96
1990	123.7	157.25	146.84	130.87

Source: OeNB (data see chart 1).

well, which might eventually dampen the structural effect.<sup>2</sup> As decided in the course of the 2003 pension reform, in the years 2004 and 2005, pensions will not be adjusted in line with paragraph 108 of the Austrian Social Security Act; the provisions on the revaluation factors have, however, remained unchanged.

To summarize, under the Austrian revaluation regime, previous contributions are de facto indexed to the inflation rate only and are therefore decoupled from real economic developments.

### 3 Reasons for Linking Revaluation Factors to Wage Development

In this chapter a numerical example is presented to show in how far an “incomplete” revaluation method, i.e. one that does not factor in wage growth, is problematic and why “complete,” i.e. wage-based, revaluation is preferable.

### 3.1 Revaluation with Wage Growth

Table 2 depicts the schematic life cycle of a fictitious birth cohort consisting of two persons, A and B. Both work for two periods and, in the subsequent period, receive a pension. Let us assume that one period spans 20 years, and that A and B enter the labor force at the age of 20. The average (wage-based) income  $\bar{w}$  grows at a rate of 50% ( $\gamma = 0.5$ ),<sup>3</sup> and the pension insurance contribution rate ( $\tau$ ) is assumed to equal 25%. In the example, we assume intragenerational differences in the wage profile, which is increasing for A and declining for B. The accrual rate is set at  $s = 0.5$  and revaluation is based on the growth rate.<sup>4</sup> If we use two assessment periods to calculate the pension (columns 7 and 8 of table 2), we arrive at a pension of 112.5 for both A and B – see equation (1) – which amounts to 50% of the then current average income of 225.<sup>5</sup>

Table 2

Pension Account of a Cohort – Revaluation with Wage Growth <sup>1</sup>									
	Employment				Pension revaluation: growth AP: 1 period		Pension revaluation: growth AP: 2 periods		
	Period 1 (earnings)		Period 2 (earnings)		Period 3 (pension)		Period 3 (pension)		
	absolute	relative	absolute	relative	absolute	relative	absolute	relative	
Person A	50	0.5	225	1.5	168.75	0.75	112.5	0.5	
Person B	150	1.5	75	0.5	56.25	0.25	112.5	0.5	
Average earnings	100	x	150	x	225	x	225	x	
Average pension	x	x	x	x	112.5	0.5	112.5	0.5	

Source: OeNB.

<sup>1</sup> The growth rate  $\gamma$  is assumed to be 0.5; average earnings thus increase from 100 to 150 in period 2. The relative amount of both earnings and pensions refers to the ratio to the average earnings accrued in the respective period. Pensions were calculated on the assumption that the contribution rate equals 25% and the accrual rate is 50%; thus the pension system posts a balanced budget.

<sup>2</sup> For an extensive discussion of this topic, see Stefanits (2003). Knell (2003) demonstrates how the legal framework can be translated into a formal, dynamic system.

<sup>3</sup> This is a realistic assumption given that a period spans 20 years.

<sup>4</sup> Inflation is left unaccounted for in the example, which is why nominal growth corresponds to real growth and no revaluation is implicitly tantamount to a revaluation with the inflation rate.

<sup>5</sup> The pension (in period 3) is calculated as follows:  $p_3 = s \frac{1}{2} (AWF_2 w_2 + AWF_1 w_1)$ , with  $AWF_t$  the revaluation factor,  $w_t$  the individual wage and  $p_t$  the pension in period  $t$ . For person A, we arrive, for instance, at:  $p_3 = 0.5 \frac{1}{2} [(1 + 0.5)225 + (1 + 0.5)^2 50] = 112.5$ .

In case this life income cycle is the same for every birth cohort, the pension system in this example is in balance in every period. This becomes immediately evident when we take a

look at the budget equation underlying any pay-as-you-go pension system (see box “Budget Equation of a Pay-As-You-Go Pension System”).<sup>6</sup>

### Budget Equation of a Pay-As-You-Go Pension System

The following condition must hold for a pension system to have a balanced budget, i.e. to not require any funding from the general government budget:

$$\tau_t \bar{\omega}_t L_t = \bar{p}_t R_t$$

(contribution rate  $\times$  average income  $\times$  number of employed persons  
= average pension  $\times$  number of pensioners) (3).

Should the size of the cohort remain constant over time, a simplified equation applies:

$$\tau_t \bar{\omega}_t G = \bar{p}_t H$$

(4),

where  $G$  denotes the number of employment periods and  $H$  the number of pension periods. For the example presented in the text, we thus arrive at:  $0.25 \times 225 \times 2 = 112.5 \times 1$ .

It is possible to rearrange equations (3) and (4), respectively:

$$\underbrace{\tau_t}_{\text{Contribution rate}} = \underbrace{\frac{\bar{p}_t}{\bar{\omega}_t}}_{\text{relative pension level}} \times \underbrace{\frac{\bar{R}_t}{L_t}}_{\text{old age dependency ratio}} \quad (5).$$

The old-age dependency ratio equals the ratio of the number of pensioners to the number of persons of working age. The average relative pension level, hereinafter denoted as  $q_t = \bar{p}_t / \bar{\omega}_t$ , reflects the percentage of the average income the average pension amounts to. In the literature, we sometimes encounter the expression “replacement rate” for the relative pension level. This is somewhat misleading because the term replacement rate sometimes also refers to the ratio of the initial pension to final pre-retirement earnings or to the average income (see section 5.2).

#### 3.1.1 Long Assessment Periods Increase the Degree of Intragenerational Fairness

A shortened assessment period yields a different result (columns 5 and 6 in table 2). While the average pension payout still amounts to 50% of the average earnings, the relative pension levels now diverge between the individual periods. Person A receives 75% of the average income, whereas B has to make do with 25%. This “inequality” is traceable to the fact that the assessment period comprises only one period. This is why A’s relatively meager income years are not counted, while vice versa B’s good income years are not factored into the calculation

either. Most people would consider such a situation as unfair. It follows that a long assessment period (covering a person’s entire employment history) raises the degree of intragenerational fairness.

#### 3.1.2 Possible Solutions to Financing Problems

Should a pay-as-you-go pension system encounter financing difficulties (e.g. in the face of demographic pressures), a balanced budget may be restored essentially via three parameters, as shown in equation (5). It is possible to increase the contribution rate, reduce the relative pension level or lower the old-age dependency ratio

<sup>6</sup> In the following “balanced budget” always refers to a balanced budget of the pension insurance system, i.e. equation (3) is fulfilled.

(e.g. by raising the retirement eligibility age).<sup>7</sup> Let us assume for the above-mentioned example that at a given point in time, life expectancy soars and that any cohort consequently spends two periods in retirement.<sup>8</sup> Using equation (4), one can calculate how the three suggested solutions would work out in practice:

- The contribution rate  $\tau$  is raised from 25% to 50%.
- The relative pension level  $q$  is lowered from 0.5 to 0.25.
- The old-age dependency ratio is maintained at 0.5 instead of allowing it to increase to 1. This means that the employment period must be extended to 2.667 periods and that the pension period accordingly amounts to a shortened 1.33 periods.

In addition to these solutions, each of which rests on only one instrument, it is possible to combine the

three measures provided equation (4) is fulfilled.

### 3.2 Incomplete Revaluation

Let us now turn to the case that previous contributions are not revalued in real terms. As outlined before, this corresponds to the situation in Austria. Table 3 illustrates this case, again for the variants with two (AP = 2) and one (AP = 1) assessment period(s). Such incomplete revaluation would result in an assessment base which is much lower than that of the complete revaluation scenario; under such circumstances, a 50% accrual rate would yield a budget surplus. To ensure comparability, we set the accrual rate for both variants such that it likewise leads to a balanced budget under the given assumptions. It follows that  $s = 0.9$  for the variant AP = 2 and that  $s = 0.75$  for AP = 1.

Table 3

#### Pension Account of a Cohort – No Real Revaluation<sup>1</sup>

	Employment				Pension revaluation: growth AP: 1 period		Pension revaluation: growth AP: 2 periods	
	Period 1 (earnings)		Period 2 (earnings)		Period 3 (pension)		Period 3 (pension)	
	absolute	relative	absolute	relative	absolute	relative	absolute	relative
Person A	50	0.5	225	1.5	168.75	0.75	123.75	0.55
Person B	150	1.5	75	0.5	56.25	0.25	101.25	0.45
Average earnings	100	x	150	x	225	x	225	x
Average pension	x	x	x	x	112.5	0.5	112.5	0.5

Source: OeNB.

<sup>1</sup> The growth rate  $\gamma$  is again assumed to be 0.5 and the contribution rate 25%. The accrual rate leading to a balanced budget can then be calculated: 90% (AP = 2), 75% (AP = 1).

In both scenarios, individual inequalities ensue. Even in the two-period scenario persons with a steeper wage profile (person A) reach a higher relative pension level. This is ascriba-

ble to the fact that for them the best income years occur at the end of their employment record and that these years are affected less by incomplete revaluation.<sup>9</sup> Furthermore, we find

<sup>7</sup> Naturally, it is additionally possible to tap other financing sources, e.g. funds from the general government budget. In the simple example such “revenue-side” measures are included in the contribution rate, though.

<sup>8</sup> The overall life span thus amounts to  $G + H = 4$ .

<sup>9</sup> In the scenario with only one assessment period, the example is construed such that the pension calculation is based on the final, and not on the best, income years. Granted, this is for demonstration purposes only. Given incomplete revaluation, the final years are in general also the best years.

that extending the assessment period, *ceteris paribus*, reduces the sum of pension payouts.

### 3.2.1 Extending the Assessment Period Entails Pension Cuts

Again, we can analyze what the response to an increase in life expectancy ( $H$  increases from one to two periods) could look like in this model. Let us assume that the current pension – see equation (2) – is not adjusted in real terms (by analogy to the revaluation provision) and that we are dealing with incomplete revaluation and an assessment period of one period (20 years); this corresponds to columns 5 and 6 of table 3, where  $s = 0.75$ . To balance the resulting deficit, the following solutions are available:

- The contribution rate  $\tau$  is raised from 25% to 41.67%.
- The accrual rate is reduced from 75% to 45%.
- The assessment period is extended to two periods and, at the same time, either the contribution rate is raised to (a lower) 34.72% or the accrual rate is cut to (a higher) 54% (or a combination of both).

Thus, in the case of incomplete revaluation, the pension level may be reduced simply by extending the assessment period. This drives down both the assessment base and pension claims, and it is not necessary to change the “observed” accrual rate (or it has to be cut to a lesser extent, as in our example).<sup>10</sup>

### 3.2.2 Incomplete Revaluation

#### Conflicts with Intragenerational and Intergenerational Fairness

The most important properties and problems of a system with incomplete revaluation may be summarized as follows.

**Conflict with intragenerational fairness principles.** As is evident from the example in table 3, persons with identical relative income positions during their employment history are allocated different pensions. Incomplete revaluation (implicitly) benefits rising wage profiles (exemplified by person A). Such inequality runs contrary to the general understanding of “fair consideration” of contribution periods spread over the life cycle. Even using the complete assessment period does not eliminate this inequality.

**Conflict with intergenerational fairness principles.** The examples given in tables 2 and 3 consider only one generation each. It would, of course, also be interesting to investigate how different cohorts are treated in one and the same pension system. In contrast to the intragenerational analysis, to this end we use the contributions and pension benefits of the representative (average) members of different cohorts and examine whether burden sharing between these generations meets the commonly understood notion of fairness. This intergenerational perspective touches on a key aspect of pay-as-you-go pension systems, whose *raison d’être* lies in the intertemporal and intergenerational redistribution of income flows. At the same time, it is related to fundamental issues of equity and fairness theories (Konow, 2003), which will not be dealt with in

<sup>10</sup> In the case of complete revaluation – as in table 2 – this is not possible. Here, extending the assessment period entails shifts in the intragenerational distribution but leaves the average pension level and thus the expenditure burden unchanged.

detail here. As discussed at greater length in Knell (2004), a generally accepted principle of intergenerational fairness states that two generations which differ only with respect to when they live should be treated the same, so that the resulting payment flows result in identical “proportionality measures.”<sup>11</sup> The proportionality measure is defined as follows:

$$\text{Proportionality measure} = \frac{\text{sum of relative outcomes}}{\text{sum of relative inputs.}}$$

If for instance – in an example with two employment periods and one pension period – one cohort pays a contribution rate of 10% (relative input) and another one of 20%, the cohort with the twofold contribution rate should attain a twofold pension level as well (i.e. the ratio of the relative pension levels  $q$  should also equal 0.5).

Incomplete revaluation violates this fairness principle, though. Of two identical cohorts – with identical contribution rates – that cohort will attain a higher relative pension level which worked in times of *lower* growth rates.<sup>12</sup> By contrast, such problems are nonexistent in wage-based revaluation regimes.

#### 4 Assessment of Individual Measures of the 2003 Pension Reform

So far, only fictitious examples have been discussed. In the light of the above findings, let us therefore now assess and quantify the respective measures of the Austrian pension reform adopted on June 11, 2003, as part of the budget trailer bills.

In this context, the focus will be on the measures related to the topic of this study, i.e. the change of the assessment period and concomitant maintenance of the revaluation and adjustment provisions as laid down in paragraph 108 of the Austrian Social Security Act. Drawing up a precise assessment of the effects is a complex and daunting – and, with the exception of a few isolated calculations, unprecedented – endeavor. Table 4 shows the changes (in the initial pension benefit) resulting for the average cohort member upon an extension of the assessment period from 15 to 40 years if (i) no real revaluation is carried out,<sup>13</sup> (ii) the growth rate amounts to 2% and 1%, respectively, and (iii) three different assumptions about the seniority profile are used.

Table 4

#### Average Loss in Pensions for an Assessment Period Extension from 15 to 40 Years

Average growth rate	Seniority-based remuneration – annual increase		
	0%	1.5%	2.5%
2%	-20.2	-30.6	-36.0
1%	-11.2	-24.1	-30.6

Source: OeNB calculations.

<sup>11</sup> Similar concepts are “Teilhabeäquivalenz” (Breyer, 2000) and “quasi-actuarial fairness” (Lindbeck and Persson, 2003).

<sup>12</sup> It is shown in Knell (2003) that the magnitude of the resulting intergenerational fluctuations is not negligible.

<sup>13</sup> Revalued at the inflation rate only.

The examples presented in tables 2 and 3 do not account for seniority-based remuneration (i.e. rising wage profiles throughout the employment history). To capture reality, seniority-based remuneration must be taken into account, however, since a steeper wage profile amplifies the effects induced by an extended assessment period. For simplicity, we start from a linearly rising wage profile and assume that each additional employment year translates into 2.5% or 1.5% higher income.<sup>14</sup>

As borne out by these back-of-the-envelope calculations, the mere extension of the assessment period (while all the other adopted reform measures are excluded) entails noticeable pension cuts in the neighborhood of between 11% and 36% (depending on the assumptions about the growth rates and the underlying seniority profile). Note that the loss relates to the *average* cohort member.

The figures shown in table 4 do not reflect the eventual loss actually incurred by persons aged 35 years and above since in their case a capping provision takes effect which limits the maximum loss to 10%. As the average cohort member is expected to reach this 10% ceiling rather quickly, this provision de facto means that all persons aged 35 years and above must take a 10% pension cut. The problematic intragenerational and intergenerational fairness features of the current system described above are therefore

prolonged. It goes without saying that the switch from “capped” to “noncapped” pension cohorts represents a gross inequity hardly justifiable from an intergenerational perspective.

Without a doubt, reforms were and are necessary to guarantee the fiscal sustainability of the Austrian pension system. Nevertheless combining the current revaluation regime with individual reform measures (especially the extension of the assessment period) generates effects which are considered problematic and worthy of improvement.<sup>15</sup> Finally, even if the new harmonized system were to be built on wage-based revaluation, appropriate transitional provisions would have to be drawn up.<sup>16</sup>

## 5 Issues Related to Wage-Based Revaluation and to Pension Adjustment

Wage-based revaluation helps avoid most of the aforementioned conflicts with intragenerational and intergenerational fairness principles. The difficulties of wage-based revaluation are different and are, above all, associated with demographic shifts, which have largely been excluded so far. Roughly speaking, there are three types of demographic processes that play a significant role in this context.

- **Fluctuations in the size of birth and work cohorts.** In Austria, the birth rate has been on a steady decline over the past decades.<sup>17</sup> While migration and stepped-up

<sup>14</sup> In addition, the results in case of nonexistent seniority-based remuneration (zero growth rate) are presented. The 1.5% and 2.5% rates are basically in line with empirical estimates for Austria (Festerer and Winter-Ebmer, 1999, tables 1 and 2). All three assumptions are debatable, particularly the assumption about the development of the revaluation factors, as the latter are linked to the adjustment factors, which in turn depend on the structural effect. The results are, however, useful as a first approximation of the effects.

<sup>15</sup> The pension reform commission (PRK) itself almost unanimously arrived at the conclusion that the provisions on the revaluation factors and net adjustment were no longer effective; and a case was made for wage-based revaluation (PRK, 2002, p. 55).

<sup>16</sup> It could, for instance, be stipulated that each additional credited year be fully revalued.

<sup>17</sup> More than 130,000 births a year in the 1960s contrast with a current 80,000 a year.

labor force participation have helped to somewhat constrain the effects of this downward trend on the size of the work cohorts, the fluctuations in the cohort size nevertheless cause problems for fiscal solidity and intergenerational solidarity.

- **Life expectancy** has been on a steady rise over the past decades, and it is assumed to increase by one year every six to eight years. This means that – given a constant pension eligibility age – the ratio of the employment period to the pension period will likewise shift steadily, again generating fiscal and intergenerational distribution problems.
- Economic fluctuations traditionally give rise to **variations in the employment ratio** (unemployment and labor force participation), which eventually results in variable contributions.<sup>18</sup> The sensitivity of a pension system to sharp cyclical movements should be kept to a minimum.

According to calculations based on conditions before the 2003 reform, in Austria the aggregate impact of these demographic fluctuations might drive up the old-age dependency ratio<sup>19</sup> from 22.9% (2000) to 40.7% (2030) (PRK, 2002, p. 72).

The challenge therefore lies in designing a rule-based structure for a pay-as-you-go pension system that accounts for these demographic trends and is at the same time sustainable in fiscal terms and intergenerationally equitable.

In the following we will elaborate on several aspects of this issue.

### 5.1 Should the Growth Rate of Average Earnings or of the Total Wage Bill Be Used for Revaluation?

This question is not only key to any pay-as-you-go pension system, but it also plays a pivotal role in designing a notional account system and setting the “notional interest rate.”<sup>20</sup> Undoubtedly, any revaluation rule based in some way on wage growth (or on real growth) is preferable to the current revaluation method. In a next step, the question arises which measure should be at the center of such wage-based revaluation. In the absence of demographic changes this distinction would be irrelevant because in that case the total wage bill  $\bar{w}_t L_t$  would grow at the same rate as average earnings  $\bar{w}_t$ . This distinction, however, becomes crucial in the face of varying cohort sizes and cyclical employment fluctuations, which result in a variable employment figure  $L_t$  over time.<sup>21</sup> Country-specific practices differ widely in this respect. For instance, revaluation is based on wage growth in Germany and Sweden, and on total wage bill growth in Poland and Latvia.

Pension systems fulfill two core functions. They provide for both intertemporal consumption smoothing over time and risk sharing at a given point in time.<sup>22</sup> The principles of intragenerationally and intergenerationally

<sup>18</sup> And – with a greater time lag – also to fluctuations in the setting of individual assessment bases for determining the pension level.

<sup>19</sup> Old-age dependency ratio = persons aged over 65 / persons aged between 15 and 64.

<sup>20</sup> The “notional interest rate” refers to the interest rate paid on contributions credited to an individual notional account.

<sup>21</sup> For a discussion of the issue of a rising life expectancy, see section 5.2.

<sup>22</sup> For more information on risk sharing, see Gordon and Varian (1988) as well as Shiller (1998).



ally fair consumption sharing may conflict with the principles of optimal risk sharing. It is possible to demonstrate that wage growth-based revaluation ensures compliance with the principle of an intergenerationally constant “proportionality measure” (section 3.2.2). If, by contrast, total wage bill growth is used for revaluation (and if current pensions are adjusted accordingly), this principle may be violated *ex post*; on the other hand, greater risk sharing ensues between pensioners and persons in the labor force. These considerations should at any rate be taken into account in choosing a revaluation regime, and, importantly, attention should also be paid to how times of nonemployment (credited service) are factored into pension calculations.

Furthermore, note has to be taken of the fact that given varying cohort sizes, neither of the two revaluation variants automatically balances the budget. At first glance, one could be led to believe that revaluation with total wage bill growth accounts for demographic shifts insofar as they are also reflected in the fluctuations of  $L_t$ . It can be shown, though, that this holds true only for the simplest two-period model ( $G = 1, H = 1$ ) and not in general.<sup>23</sup> Amid fluctuating fertility rates and cohort sizes a pay-as-you-go pension system requires explicit demographic adjustment measures to remain fiscally sustainable. A discussion of some aspects of automatic adjustment factors follows below.

## 5.2 Increase in Life Expectancy and the 80-45-65 Formula

The current debate frequently refers to one consensual cornerstone: The new harmonized pension system is meant to be in line with the 80-45-65 formula – 80% pension after 45 years of contributory service at the age of 65. In the light of an ever-rising life expectancy, it is but a question of time when such a formula will cease to be applicable. If the contribution rate is to remain constant (and this is almost always the explicit or implicit assumption), this formula does not provide any flexible adjustment parameter, which means that the financing gap would eventually have to be covered by tax revenues. Nevertheless, such a formula may serve as a useful reference point during a pension reform. This would, however, by extension imply that it – at least roughly – complies with a balanced pension system based on the current demographic framework conditions.

Let us now investigate whether an average pensioner who retires at the age of 65 with 45 years of contributory service is indeed eligible for an 80% replacement rate on the condition of a constant contribution rate and a balanced budget. Revaluation is assumed to be based on wage growth and the average life expectancy to stand at 80 years (at present: 75 years for men and 81.5 years for women).<sup>24</sup> No immediate answer can be given to the question whether an 80% replacement rate is feasible under these conditions without previously clarifying the following issues: Which income concept (gross or net earnings, etc.) at which point in time

<sup>23</sup> Lindbeck and Persson (2003, p. 86f.).

<sup>24</sup> In line with the notation introduced in chapter 3, the central parts of the formula are as follows:  $G = 45$ ,  $H = 15$  and  $t = 0.228$ .

(final earnings, average life income) does the replacement rate refer to? Are we dealing with the replacement rate of the initial pension only or with the average replacement rate over the entire pension period?

In the current debate, the replacement rate usually relates to the average life income and the focus is exclusively on the initial replacement rate (referring to the initial pension). As

to the income concept, a distinction has to be drawn between the replacement rate related to gross earnings and the replacement rate related to gross earnings after deduction of pension insurance contributions; the latter is sometimes also called net replacement rate, which is somewhat misleading (see box “Definitions of Initial Replacement Rates”).

#### Definitions of Initial Replacement Rates

Initial replacement rates are the replacement rates indicating the ratio of the initial pension  $p_{1,t}$  to previous annual earnings. The initial replacement rate related to gross earnings ( $EER_t^B$ ) and the initial replacement rate related to gross earnings after deduction of pension insurance contributions ( $EER_t^N$ ) are defined as follows:

$$EER_t^B = \frac{p_{1,t}}{LE_t}$$

$$EER_t^N = \frac{p_{1,t}}{(1 - \tau_{AN})LE_t}$$

where  $\tau_{AN}$  denotes the employee’s contribution to the pension insurance (in Austria  $\tau_{AN} = 0.125$ ) and  $LE_t$  the average previous annual earnings revalued with the wage growth of pensioners at time  $t$ . Under the given assumptions, this corresponds exactly to current average earnings  $\bar{\omega}_t$ . The replacement rate  $EER_t^B$  corresponds (under an assumed “stationary state”) exactly to the pension level  $q_t$ .

In addition, it is possible to define an initial replacement rate related to net earnings:

$$EER_t^{NE} = \frac{(1 - \bar{\theta}_p)p_{1,t}}{(1 - \bar{\theta}_\omega)(1 - \tau_{AN})LE_t},$$

where  $\bar{\theta}_\omega(\bar{\theta}_p)$  is the average tax rate of wage earners (pensioners). In the light of tax progressivity, one can assume that  $\bar{\theta}_\omega > \bar{\theta}_p$  and that:  $EER_t^{NE} > EER_t^N$ . The estimates provided in this paper, however, relate only to the replacement rates  $EER_t^B$  and  $EER_t^N$ .

From the perspective of a “living standard concept,” the net replacement rate is more adequate as for pensioners (employees’) contributions are no longer due. The current proposals incorporate all the various approaches.<sup>25</sup>

So far this study has dealt primarily with the setting of the revaluation factors. At this point, it is, however,

necessary to also look at pension adjustment methods, which figure prominently in tackling the issue at hand and play an important role in general. If the pension is indexed to wage growth, the relative pension level remains constant over the pension period, whereas with a lower adjustment factor, the pension level decreases steadily over time, which,

<sup>25</sup> The pension reform commission seems to favor  $EER_t^N$ , the Social Democratic Party (SPÖ)  $EER_t^{NE}$  and the Austrian Trade Union Federation (ÖGB)  $EER_t^B$ . According to the pension reform commission, the new, actuarially fair pension calculation formula is to yield a net replacement rate of 80% for a pension eligibility age of 65 after 45 years of contributory service (PRK, 2002, p. 81); the SPÖ states that after 45 years of contributory service, a net replacement rate of 80% (i.e. 80% of the life income) is reached (SPÖ, 2003, p. 10); finally, according to the ÖGB, following 45 years of contributory service, a person attains a pension claim at the full retirement age of 65 to the tune of 80% of the assessment base (ÖGB, 2003, p. 7).

ceteris paribus, naturally allows for a higher initial replacement rate. The exact amount of an initial replacement rate that is compatible with a balanced budget depends on the expected (or average) growth rate. Table 5 reflects the values for three assumptions: a

pension adjustment with wage growth and an adjustment with the inflation rate at an average wage growth of 1% and 2%, respectively. Interestingly, all the available proposals appear to favor inflation indexation.<sup>26</sup>

Table 5

**Different Replacement Rates<sup>1</sup>**

	Pension adjusted with		
	wage growth	inflation rate ( $\gamma = 0.01$ )	inflation rate ( $\gamma = 0.02$ )
Gross replacement rate ( $EER^B$ – initial replacement rate related to gross earnings)	0.684	0.733	0.783
Net replacement rate ( $EER^N$ initial replacement rate related to gross earnings less contributions)	0.762	0.816	0.872

Source: OeNB calculations.

<sup>1</sup> Average life expectancy is assumed to equal 80 years; furthermore, it is assumed that retirement occurs at the age of 65 after 45 years of pensionable service and that the contribution rate remains constant at  $\tau = 0.228$ . The figures in the table show (under different initial replacement rate concepts and pension adjustment regimes) which initial replacement rates are compatible with a balanced budget under these assumptions.

The values in table 5 show that the 80% target is compatible with a balanced budget given the current structural parameters, provided reference is made to the net concept and that pensions are indexed to the inflation rate. Even when we take into account any exceptions (e.g. concerning blue-collar workers and pension credit provisions), the 80-45-65 formula still appears realistic and feasible.<sup>27</sup>

Whether keeping pensions indexed to the inflation rate is the optimal choice for a long-term system is open to debate. For one thing, inter-generational fairness is once again an issue (less so intragenerational fairness), as discussed in chapter 3 in con-

nection with the revaluation factors. For another, this method implies that over a long pension period real purchasing power could diminish steadily, possibly pushing some groups of the population below the poverty line.

The following two arguments are commonly put forth to validate inflation indexation: (i) In times in which the budget of the pension system is not balanced, this practice implies that the pension cohorts help cofinance the system; (ii) furthermore, inflation indexation implicitly leads to a more equitable distribution of pension benefits between individuals with different life spans. Both arguments are also controversial, though. Should all

<sup>26</sup> The majority of the pension reform commission members are strongly in favor of switching to a pension adjustment based on consumer price developments (PRK, 2002, p. 80); the pensions are adjusted at least with the inflation rate so that the purchasing power of the pensions does not diminish. (SPÖ, 2003, p. 10); a crucial element of a predictable and secure pension promise is guaranteed ongoing adjustment with a view to avoiding a loss of real purchasing power. The future model thus envisages yearly adjustments with the inflation rate. (ÖGB, 2003, p. 11).

<sup>27</sup> In this context, it would, of course, also be conceivable that pension credit provisions are funded by the general budget or by earmarked budgets to which such benefits are assignable. Stefanits and Mayer-Schulz (2001) tried to assess the credited contributions of the year 1999. The costs amount to some 10% of total pension expenditures, which accounts for a considerable part – about half – of the federal subsidy for pensions (p. 31).

cohorts and individuals really be required to fund such a financing gap to the same (proportional) extent, or would not a system be preferable in which persons who receive higher pensions make a larger contribution (for such a transitional period)? As regards item (ii), the question is whether inflation indexation is a suitable principle in the long run. Given people's risk aversion when buying insurance, it is safe to assume that people would prefer a lower, yet constant replacement rate to a rate that continuously decreases from an initially higher value.

In any case, chances are that the formula will have to be adapted to changes in life expectancy from time to time (e.g. 80-45-67, 75-45-65), either discretionarily or according to a fixed mechanism tracking life expectancy development. A pension system must respond not only to changes in life expectancy, but also to other demographic fluctuations, though. For this reason, a "pension period factor" geared exclusively towards changes in life expectancy was again dropped from Germany's recent pension reform since any employment period fluctuations would have been neglected (Börsch-Supan et al., 2003, p. 27).

### 5.3 Absolute or Relative Concepts

In the public debate, we occasionally hear the argument that there is in fact no pension crisis because in an expanding economy the additional output gains (or parts thereof) could be channeled into retirement provisions. To illustrate this argument, let us recall the example given in table 2. Average earnings in period 3 (225) clearly exceed those of period 2. The newly retired only achieved average real gross earnings of 150 and net

earnings of  $150(1-0.25) = 112.5$  during their active years. So, one could in principle "trim" the currently employed persons' earnings by 112.5 without putting them at a disadvantage in absolute terms relative to the new pensioners' previous earnings. Following such a "diversion of the growth dividend," the contribution rate would, however, have to be raised to 50%. *In absolute terms*, the employed would then be on an equal footing with the retired, bearing, however, double the *relative* burden of their predecessor generation.

Similar switching between absolute and relative concepts is also observable in respect of pension adjustment. Here, experts always emphasize that inflation indexation maintains the purchasing power of pensions (i.e. real disposable income). At the same time, it has to be borne in mind that as a result, the relative pension level contracts steadily over the pension period. And this is certainly not inconsequential – as pointed out in section 5.2 – in a long-term pension system.

In a nutshell, whenever contributions and benefits are discussed, it should always be clear whether talk is of relative or absolute values. Which perspective to choose will depend on the issue at hand, but in general it is safe to assume that in an intergenerational context the relative concept is preferable (Settergren, 2001; Knell, 2004).

### 5.4 Demographic Adjustment Factors and the German "Sustainability Factor"

The extension of life expectancy is one reason for the anticipated increase in the old-age dependency ratio (section 5.3). Another reason is the steady decline in the size of birth and work

cohorts, which is frequently regarded as the primary demographic challenge.<sup>28</sup> For this reason, the 2004 German pension reform incorporated a demographic adjustment factor (sustainability factor) into the pension system. Should the pensioner dependency ratio change over time, the sustainability factor stipulates that a share  $\alpha$  of the necessary adjustment be brought about by reducing the relative pension level (or the replacement rate) and a share  $(1-\alpha)$  by raising the contribution rate. The parameter  $\alpha$  was set at 0.25.<sup>29</sup> By 2030 the contribution rate is forecast to advance from about 19.5% to 23% and the gross pension level is expected to fall from 48.5% to around 40% (Börsch-Supan et al., 2003).

While the rationale for introducing such an automatic adjustment factor is conclusive (section 5.2), note should also be taken of several complicating factors. First, fiscal criteria frequently seem to predominate in this context. In Germany, setting  $\alpha$  at 0.25 is mainly due to the existence of a target capping at 22% contributions until the year 2030. Though this is frequently overlooked, variations of  $\alpha$  would entail disparate effects on intergenerational burden sharing. As a case in point, a chiefly contribution-oriented adjustment (low  $\alpha$ ) places greater demands on the young than an adjustment of the pension level (high  $\alpha$ ). Which of these principles is considered fairer depends to a great extent on which generations

are to be held responsible for the drop in the fertility rate. Knell (2004) discusses this issue at length and argues that from the perspective of intergenerational fairness the second variant (high  $\alpha$ ) would be preferable.

Second, it has to be clear that the quality of the implementation of such a sustainability factor may differ depending on the given framework conditions. Knell (2004) provides evidence for the incompatibility of such a formula with a conventional notional account system since the ever-changing contribution rate would counteract the automatic balancing of the budget (Valdés-Prieto, 2000).<sup>30</sup>

## 6 Summary and Outlook

This study has explored various aspects of revaluation and adjustment factors in pay-as-you-go pension systems. Following evidence indicating that under the current pension regime in Austria, previous contributions are not revalued in real terms, the paper continued to examine in how far such a situation conflicts with principles of intragenerational and intergenerational fairness. Furthermore, it was shown that extending the assessment period while keeping the revaluation provisions in place would lead to substantial pension cuts of between 11% and 36%. A capping provision, while allowing several pension cohorts to avoid such losses, creates new fairness problems.

At any rate, a harmonized system should rely on a wage-based revalua-

<sup>28</sup> A contraction in the size of the working age population is more critical for financing a pension scheme than an increase in life expectancy. (PRK, 2002, p. 76).

<sup>29</sup> Adjusted to the notation of this paper, the sustainability factor may be expressed as follows:  $q_{t+1} = q_t \frac{1-r_{t+1}}{1-r_t} \left[ \left( 1 - \frac{R_{t+1}}{L_{t+1}} / \frac{R_t}{L_t} \right) \alpha + 1 \right]$ . Here, we do not account for specificities of the German system (e.g. the phased increase in private supplementary pensions also referred to as “Riester ladder,” time lags).

<sup>30</sup> The Swedish notional account system has an alternative automatic adjustment mechanism, the “automatic balance mechanism,” which is meant to provide for fiscal balancing irrespective of demographic fluctuations. For a detailed description of this mechanism, see Settergren (2001) as well as Settergren and Mikula (2003).

tion method. Note that this calls for principal decisions to be made at the very beginning of reform efforts, as highlighted in this paper. First, it is necessary to decide whether to revalue with the growth rate of average earnings or of the total wage bill. Neither of the two variants seems to be preferable to the other on all counts. While revaluation with the former index is more in line with the “equity principle,” the latter method provides for better risk sharing. Moreover, none of the two methods guarantees a balanced budget in the long run. Besides, additional demographic adjustment factors are required to address demographic fluctuations.

A related question is whether current pensions should likewise be indexed to wage growth or rather to inflation. Inflation indexing seems to be more popular these days even though there are credible objections against applying such an adjustment method also to long-term systems and not just to transitional periods.

Finally, it has to be determined whether to build automatic demographic adjustment factors (“sustainability factors”) into the pension system. The challenge lies in designing a structure which safeguards fiscal sta-

bility amid demographic shifts and at the same time complies with commonly accepted fairness principles. One option would for instance be to regularly align the concept of the average pensioner, i.e. the 80-45-65 formula, with changes in life expectancy. In this context, this paper examined whether it was at all possible, given the current demographic structure, to offer an 80% replacement rate at the age of 65 after 45 years of contributory service as well as to meet the requirement of a balanced budget. This question was answered in the affirmative provided (a) a net replacement rate concept is used, (b) current pensions are indexed to inflation and (c) credited contributions are funded primarily from alternative sources. On the other hand, more broadly based demographic adjustment factors exist as well, such as the sustainability factor recently introduced in Germany. It was stressed that fiscal necessity should not be the only determinant in choosing such a factor; rather, intergenerational burden sharing should be factored into the decision as well. Last, but not least, it was pointed out that not all factors are equally suited for a conventional model or a notional account system.<sup>31</sup>

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<sup>31</sup> To economize on space, I did not deal with detailed aspects of notional account systems in this study. For in-depth descriptions of their workings, their strengths and weaknesses, see: Disney (1999), Palmer (2000), Börsch-Supan (2003). Türk (2002) and Rüdä (2004) focus on the situation in Austria.

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# Financial Market Structure and Economic Growth: A Cross-Country Perspective

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The paper contributes to understanding the impact of financial system indicators on economic growth. A particular emphasis is placed on financial structure indicators, which measure the specific organization of the financial system, namely, banking sector concentration, foreign bank penetration, government regulation and the efficiency of the banking industry – as opposed to depth indicators, which measure financial market liquidity. In this respect (1) the concentration of banks was found to have a detrimental impact on growth. However, concentration may also have indirect and positive impacts on growth depending on a country's initial stage of economic development, i.e. for comparatively more developed countries, the negative impact of concentration on long-run growth is lower. (2) Financial liquidity indicators, which work through both physical capital accumulation and total factor productivity, have a strong impact on economic growth. The catalyst role of banks appears to be particularly important in earlier phases of economic development. (3) Initial real GDP per capita, finally, determines the growth path of an economy. Low initial real GDP is positively related to the growth path of economies in terms of the "latecomer advantage." Given the detrimental effects of banking sector concentration on economic growth, a tentative policy conclusion would be that antitrust authorities should strive to maintain competitively structured markets. In order to increase competition in an environment subject to mergers, which significantly reduce the number of financial services providers, obstacles to the mobility of customers should be removed, for example by setting and enforcing transparency rules regarding products and prices for financial services.

## How Does Financial Sector Concentration Affect Economic Growth?

A growing body of literature reports a positive relationship between the *size of the financial system* and economic growth. King and Levine (1993) – one of the most influential studies in this area – find a strong and statistically significant link between financial liquidity measures and growth and argue for a causal relationship that runs from financial development to growth and not vice versa. With the exception of causality issues the King and Levine proposition appears to be a generally accepted opinion.<sup>2</sup> A different strand of the literature investigates the impact of *financial market structure*

in contrast with financial market depth on economic growth. Financial development (or size) can be measured by stock market turnover or the volume of liquid liabilities provided by the financial intermediary system. Financial market structure, in comparison, is a much broader concept reflecting the specific organization of the financial system. The structure of the financial market is shaped by institutions (such as supervisory or regulatory authorities), the financial technology (such as the payment system) and the rules of the game that define how financial activity is organized (such as investor protection regulations). Given the complexity of the financial market structure, research-

<sup>1</sup> I acknowledge substantial help from Ernst Glatzer in the collection and preparation of the database used in the paper. Comments by Ernest Gnan, Helene Schuberth and Maria Teresa Valderrama were very helpful. Ingeborg Schuch provided editorial help. Any remaining errors remain my sole responsibility.

<sup>2</sup> The question of whether finance leads real activity or whether real activity leads finance cannot be answered in such purity. While economic growth certainly promotes the development of financial systems, it is inconceivable that financial development should not be correlated somehow with economic growth. In fact, examples for both views are readily found. The 19<sup>th</sup> century expansion of railroad tracks in the United States, which brought about the financial infrastructure capable of meeting the financing requirements, is one example of primarily demand-driven financial market development. In contrast, high-tech Silicon Valley startups were probably promoted by existing venture capital funds. The importance of venture capital for young innovative firms has been shown empirically for instance by Romain et al. (2003), who find the accumulation of venture capital to have contributed directly to economic growth for a panel of 16 OECD countries.



ers in this area have typically focused on selected aspects. For instance, La Porta et al. (1997) argue that countries with poorer investor protection and poorer law enforcement have less developed financial systems. In a more recent paper La Porta et al. (2002) provide evidence that higher government ownership of banks is associated with slower subsequent financial development and lower growth of real GDP per capita “as governments acquire control of banks in order to provide subsidies and other benefits to supporters who return the favour in the form of votes, political contribution and bribes.” Recently de Ávila (2003) and Dehejia and Lleras-Muney (2003) have been investigating the growth impact of the harmonization and liberalization of banking sector regulation for the European Union countries and the United States, respectively. They arrive at the conclusion that deregulation had a positive impact on economic growth.

This paper tries to contribute to understanding the impact of financial market structure on economic growth by investigating the growth impact of banking sector concentration, foreign bank penetration and banking sector efficiency across income groups of countries. Banking sector concentration has increased noticeably over the last ten years. Amel et al. (2002) report a wave of worldwide mergers and acquisitions (M&A) in the financial sector: M&A activity in the financial industry accelerated from 5,725 cases in the first half of the 1990s to 9,777 cases from 1996 to 2001. In this period, the M&A value rose almost fivefold (from USD 460.9 billion in the first half of the 1990s to USD 2,232.9 billion during the period from 1996 to 2001). According to the Group of Ten (2001) the main

causes of financial sector consolidation are the promise of cost savings and revenue enhancements; market forces unleashed by improvements in information technology, financial deregulation, globalization of financial and real markets; and increased shareholder pressure for financial performance. Against this background it is all the more surprising how little the impact of financial consolidation on economic growth has been explored empirically. From a cross-country perspective the present study is one of the very few considering the growth impact of banking sector concentration. Most of the studies on the growth impact of banking sector concentration are country-specific (e.g. Petersen and Rajan, 1995). At the cross-country level Cetorelli and Gambera (2001) provide evidence that concentration has a depressing impact on all industry sectors, and hence also economy-wide. This study explores the issue of concentration for a panel of 45 developed and developing countries and provides additional insight in the sense that the growth impact of banking sector concentration depends on the stage of development of an economy.

This paper also provides evidence of the relationship between banking sector consolidation, foreign bank penetration, financial sector size and long-run GDP growth. Our analysis suggests that foreign bank penetration and efficiency considerations are not sufficient to fully explain banking sector concentration. More importantly, the paper finds that the concentration of banks has a detrimental impact on economic growth and that the strength of the growth-reducing impact is more pronounced for initially less developed countries than for initially more developed economies.

History has shown that a tradeoff may exist between concentration and competition in the financial sector, as more concentration may enhance financial sector stability at the expense of the diversity and innovation of services (see Mayer, 2000). In that sense our paper provides evidence that the tradeoff between competition and investor protection (or enhanced financial stability) is biased towards investor protection. In fact, the latter observation is easily explained as bank failures usually induce political gyrations that cause depositor protection to be favored over competition.

Chapter 1 of the paper discusses the potential impact of banking sector concentration, foreign bank penetration and government regulation of the financial system. Section 2.1 provides a descriptive analysis for the development of the financial structure over a cross section of countries, while further empirical evidence on the finance – growth nexus is shown in section 2.2. Chapter 3 discusses the empirical findings and offers tentative policy recommendations.

## **I The Financial Market System – Growth Nexus**

Financial systems enhance growth by channelling savings to their most efficient means. Financial systems potentially promote several sources of growth: capital accumulation and total factor productivity, in particular research and development and human capital accumulation. Even if a country has abundant savings, its growth can be hampered owing to the way financial activities are organized and the way firms are managed – problems that are in fact closely related. More specifically, financial systems reduce market frictions and reduce costs arising through the conclusion of

contracts and the need to enforce them. Market frictions, which increase trading costs, are the outcome of asymmetric information between investors and savers. For example, seeking the information that will reveal the creditworthiness of a debtor consumes resources. Properly functioning financial systems reduce such transaction and information costs by – among other things – diversifying risk and monitoring the allocation of financial funds. Hence, the question is how do bank concentration, foreign ownership of banks and government regulation affect the efficient working of financial markets and intermediaries?

### **1.1 A Priori the Direction of the Growth Impact of Banking Sector Concentration Is Unclear**

What is the impact of banking sector concentration on economic growth? There is no straightforward answer to this question. Concentration results in an institutional environment shaped by large players. Large and important banks may themselves have an influence on bank regulation, taxes, foreign bank entry or the transparency and accuracy of the accounting standard.

#### **Negative Growth Impact of Concentration**

High concentration may affect growth negatively because a purely monopolistic market tends to impose welfare losses compared with the benchmark of a competitive market. As Pagano (1993) shows market power allows banks to charge higher loan rates and offer savers lower deposit rates. An increased net interest rate margin reduces the equilibrium quantity of funds available for credit and therefore also the rate at which an economy

can grow.<sup>3</sup> Empirically it has been shown that larger net interest rate margins are a consequence of less competitive markets. For instance, Demirgüç-Kunt et al. (2003) provide evidence that regulations on bank entry, restrictions on bank activities, and regulations that restrain the freedom of banks to conduct their business boost banks' net interest margins. In turn, the function of the financial system to transfer available resources to the most efficient means is hampered. Concentration, hence, has the potential to negatively impact economic growth via its potential to fundamentally change policy as well as the regulatory and institutional environment.

Another channel through which a monopolistic banking market negatively affects economic growth was shown by Guzman (2000). Within a general equilibrium framework he concludes that large banks tend to depress capital accumulation via either credit rationing and/or excessive monitoring as relatively high loan rates induce entrepreneurs to undertake riskier projects.

Furthermore Shaffer (1998) shows that more fragmented banking markets may have a pool of less qualitative borrowers compared to a banking sector with few large banks as rejected fund seekers can take advantage of imperfect screening technologies and continue to apply to other banks so that "lemons," i.e. credit seekers with a relatively inferior creditworthiness, remain in the market.

### **Possible Positive Growth Effects of Concentration**

At the same time, a highly concentrated banking sector may enhance growth due to its stronger resistance to financial crises as larger banks tend to spread their activities geographically. A historical example illustrates this case. Mayer (2000) reports that the small local banks which made a substantial contribution to the development of British manufacturing in the first half of the 19<sup>th</sup> century suffered a major setback in the period between 1809 to 1830 during which 311 banks went bankrupt (more than one third of British banks at that time). Triggered by the crisis, depositor protection was enhanced at the expense of competition, concentration increased and the geographic distribution of banks' operations widened considerably.<sup>4</sup> Hence, regulation which promoted depositor protection led not only to increased financial stability but also fueled concentration in the banking sector. La Porta et al. (1997) provide empirical evidence that financial systems are better developed in countries with a higher degree of investor protection (depositors can also be regarded as investors). Striking the right balance between higher investor protection (implying a more concentrated market due to stricter legal requirements) and more competition, though, is a difficult task as the British example clearly shows.

Apart from its financial stability-enhancing impact, banking sector concentration may also be expected to have a positive effect on bank lend-

<sup>3</sup> Hence the allocation of the competitive banking market would be Pareto preferred to the monopolistic banking market. Banks of course would make a lower (zero) profit in the competitive environment. However, the comparative loss banks suffer could be compensated by the gain debtors make.

<sup>4</sup> In 1850, 459 banks in the United Kingdom operated on average 5 branches while in 1913, 88 banks operated on average 156 branches.

ing (provided concentration is mostly the result of cost efficiency considerations). Concentrated banking sectors may take advantage of economies of scale in the production of banking services (cost savings due to consolidating the output of different banks). As a consequence potential cost savings may lead to banks with a higher market share and a superior cost structure.<sup>5</sup>

Another feature of the positive growth impact of large banks was shown by Petersen and Rajan (1995). Monopolistic banks may have an incentive to pursue profitable projects which are only successful in the longer term whereas in a competitive banking market such investments would have a lower probability of getting funded. The rationale for this is that in a market with many banks, project returns are not necessarily earned by those which initially subsidize the firms. Hence, in a fragmented market there are diminished incentives to initially subsidize risky long-term projects, as firms may be bid away by competitor banks. Hence, young yet unknown firms with no track record and profitable but risky long-term projects have a higher chance of getting funded in a concentrated banking market.

### **1.2 Growth Impact of Foreign-Owned Banks and of Government Regulation of Banks**

Governments for a long time restricted foreign ownership of banks or nonresident activity. However, recently financial sector consolidation has been gaining momentum. Wachtel (2001) argues that foreign bank pene-

tration leads to a rapid introduction of product and service innovations and the development of financial systems. Furthermore it may lead to economies of scale and scope and attract foreign direct investment. However, foreign-owned banks may also be of a disadvantage for locally operating small and medium-sized enterprises (SME). Big domestic banks operating in large markets tend to be engaged in relationship lending to SME with little or no track record. However, foreign-owned banks with far away headquarters may avoid business relationships based on soft information. In fact, Berger et al. (2003) provide empirical evidence that – in spite of the globalization of the banking industry – corporations tend to prefer local or regional banks for their service.

Concerning the impact of government ownership or government regulation of the banking sector on economic growth there are two conflicting views. The development view emphasizes positive effects on real GDP growth while the political economy view does not. According to Gerschenkron (1966) the role of the government in financing depends on the degree of industrialization (in the notions of Gerschenkron extremely backward, backward and advanced industrial stage). In an advanced stage of development, industrialization is mainly achieved via internal financing whereas a country at a moderately backward stage relies on bank financing. In extremely backward countries, though, the public authorities have to step in to jumpstart economic and financial developments. Hence, public banks have a stated policy agenda to

<sup>5</sup> However, investigations on the country-specific cost curves of the banking sector (for the U.S.A. as well as Europe) could not find empirical evidence for a robust relationship between concentration and banking sector efficiency (see for instance Demirgüç-Kunt et al., 2003).

develop a specific industry, sector or region, and often lend at subsidized rates. Hellmann et al. (1996) argue that for developing countries with a poor institutional structure, governments may promote the stability of the financial system through a set of financial policies (deposit rate controls, lending rate controls, restrictions on entry). Such a financial policy set is intended to create rent opportunities for the private sector and enhances the soundness of the financial system. Yet, good intentions of governments do not always materialize. For instance, Guiso et al. (2003) argue that the main rationale behind the Italian banking law of 1936 was the objective to enhance banking sector stability through severe restrictions on competition. What the 1936 law did was in fact hamper economic performance in Italy. The authors argue that the north-south gap in Italy is a direct consequence of the 1936 banking sector regulation. Furthermore financial stability was not enhanced, as provinces with more restrictive regulations experienced a higher variability in the percentage of bad loans than provinces where the banking market was more competitive.

## 2 Empirical Evidence on Financial System Indicators, Growth and the Sources of Growth

### 2.1 How Did Financial Market Structure Develop Over Time?

The development of concentration of domestic banks (in terms of the share of assets held by the three largest intermediaries), foreign bank penetration (in terms of (a) foreign bank assets on total banking sector assets and (b) the number of banks in total banks operating in the domestic market) and two efficiency measures (overhead costs and the net interest rate margin) is described by means of descriptive statistics.

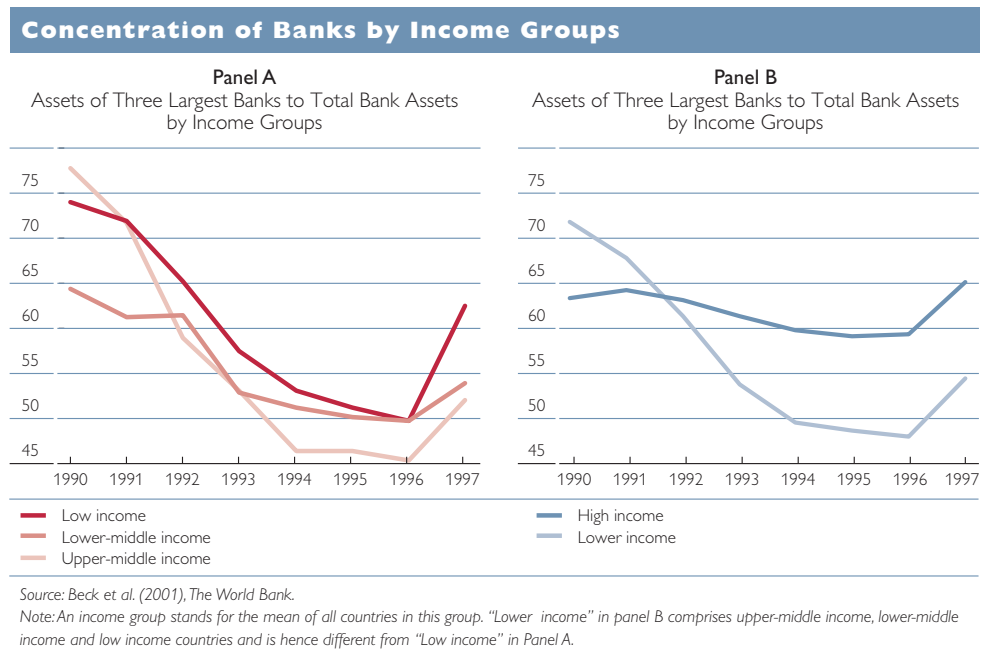
The financial market indicators used were compiled by Beck et al. (2001). For the purpose of the analysis, countries are grouped according to the 2001 World Development Indicators.<sup>6</sup> Our sample comprises 22 high income, 11 upper-middle income, 10 lower-middle income and 5 low income countries.<sup>7</sup> For the purpose of comparison we also pool upper-middle, lower-middle and low income countries so as to obtain two groups with approximately the same size. Furthermore we eliminate the two former socialist countries Hungary and the Czech Republic as well as China from our sample.

*Concentration* of banks is defined as the ratio of the three largest banks' assets to total banking sector assets.

<sup>6</sup> The 2001 World Development Indicators classify economies according to the 2000 GDP per capita taking account of exchange rate fluctuations and inflation differentials via the so-called World Bank Atlas method. The World Bank income groups are: less than USD 755 (low income); USD 756 to USD 2,995 (lower-middle income); USD 2,996 to USD 9,265 (upper-middle income); above USD 9,266 (high income countries).

<sup>7</sup> High income countries are Australia, Austria, Belgium, Bahrain, Canada, Denmark, Finland, France, Germany, Greece, Italy, Israel, Japan, Luxembourg, the Netherlands, Norway, Portugal, Qatar, Singapore, Spain, Switzerland and the United Kingdom. Upper-middle income countries are Argentina, Brazil, Chile, the Czech Republic, Hungary, Lebanon, Mexico, Oman, Panama, Saudi Arabia and Uruguay. Lower-middle income countries are Bolivia, China, Colombia, Ecuador, Guatemala, Jordan, Philippines, South Africa, Thailand and Turkey. Low income countries are Bangladesh, Indonesia, India, Kenya and Pakistan.

Chart 1



High concentration as well as overly fragmented banking sectors may have negative effects on efficiency and growth as well as financial stability. A highly concentrated banking sector may lead to lack of competition whereas fragmented banking markets may suffer from undercapitalized banks and are thus at a higher risk to suffer from financial market shocks.

Considering the *concentration of banks* over the cross section of countries it appears that, first, upper-middle and lower-middle income countries have a lower concentration ratio than low income countries (see panel A of chart 1). Second, high income countries record the highest concentration ratio (see panel B of chart 1). However, high income countries include both top scorers – in particular oil exporting countries (e.g. Bahrain and Qatar record an average concentration ratio of more than 90% for the time period 1990 to 1997) – and countries with the least concentrated commercial banking sectors in our sample – such as the U.S.A. and Japan

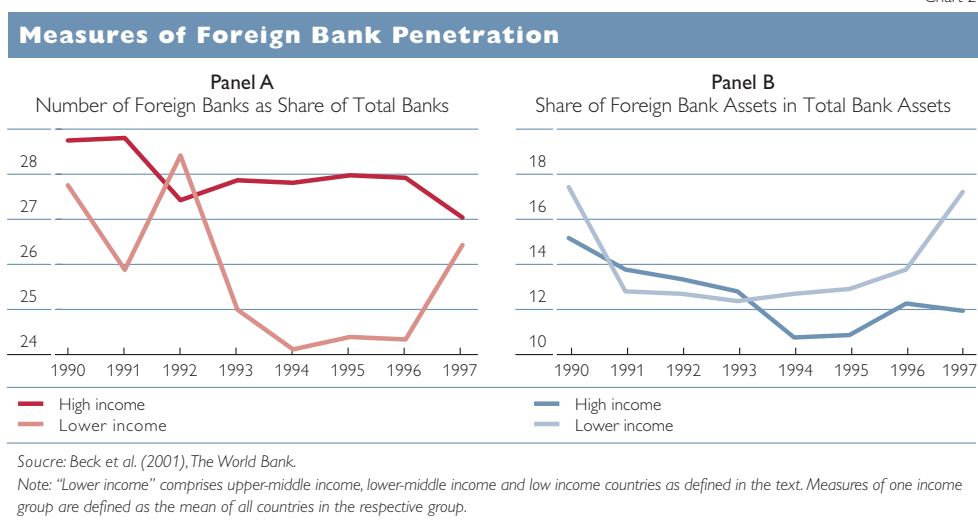
(with an average concentration ratio of about 20% during 1990 to 1997). Low income countries record a concentration ratio of more than 70% during the 1990s. While concentration ratios diverge within income groups, on average it appears that the concentration ratio decreases initially with the advancement of the economy from low to upper-middle income countries while it increases again at an advanced stage of development. This statement does not claim any established link between concentration and economic growth (statistical evidence will be given in section 2.2). However, it is interesting to note that the pattern coincides with Gerschekron's view that in early stages of development the state takes over the function of the financial system (implying a high concentration of the financial industry) while banks (in particular banks operating locally) become important during the transition period.

The pattern of *foreign bank penetration* is much more diverse across

income groups of countries. Two measures of foreign bank penetration are investigated. First, the share of foreign banks' assets in total banking sector assets and second the number of foreign banks as a share of the total number of banks in the market. A hypothesis would be that a higher penetration by foreign banks leads to increased banking sector efficiency, i.e. lower overhead costs or a lower net interest rate margin. However, this picture does not emerge from the

data, as is evident in charts 2 and 3. Judging from the share of foreign banks in the total number of banks, higher income countries seem to have a higher foreign bank penetration (see panel A of chart 2). However, the juxtaposition of foreign assets with total banking sector assets yields the opposite relationship, i.e. lower income countries have a higher foreign bank penetration on average for the period from 1990 to 1997 (see panel B of chart 2).

Chart 2



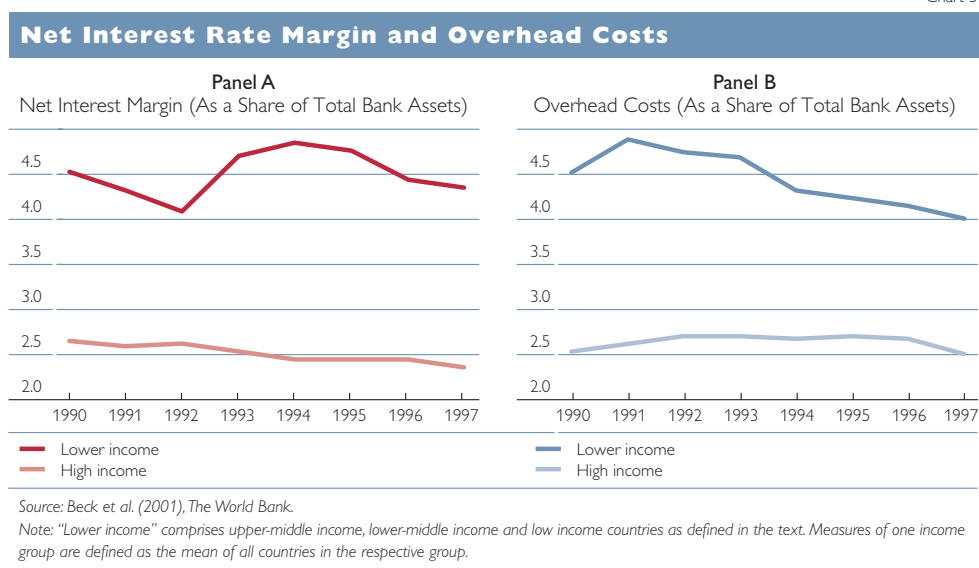
Considering individual countries, the U.S.A. and Japan record on average during the period from 1990 to 1997 the lowest share of foreign banks (less than 10% as a share of all banks) while at the other extreme high income countries like the United Kingdom record much higher proportions. For the United Kingdom the average foreign bank penetration during the observation period (in terms of foreign bank branches) is about 45% and hence similar to the measures for some low income countries.

With respect to the *public ownership* of domestic banks some authors argue that – at least in poor countries – increasing government control

of banks goes hand in hand with a negative growth impact. La Porta et al. (2002) provide evidence for this view. In their assessment low income countries are characterized by “backward financial systems, interventionist and inefficient governments, and poor protection of property rights” which is associated with “slower subsequent financial development and lower growth of per capita income and productivity.”

As proxies for *efficiency* measures we apply two indicators. First, the net interest rate margin, which measures a bank's net interest revenue as a share of its total assets and, second, overhead costs as a share of its total

Chart 3



assets. The net interest rate margin turns out to be lower in high income countries. Luxembourg and also Japan are among the high income countries with the lowest net interest rate margin as well as the lowest overhead costs. However, there are some high income countries ranking low in terms of efficiency (e.g. the U.S.A.) and some low income countries ranking high (e.g. Egypt) either in terms of the net interest rate margin or overhead costs.

Hence, it appears that banks of high income countries act more efficiently. Yet, why this is the case is not obvious from the descriptive statistics shown in charts 1 and 2 because in our sample, middle income countries on average have a more concentrated yet at the same time more efficient banking sector than low income countries. Furthermore, the hypothesis that a higher foreign bank penetration generates more efficiency does

not appear to hold when foreign bank penetration is measured as the share of foreign banks' assets in total banking sector assets.

## 2.2 Growth Indicators and the Sources of Growth

In the following, we investigate the relationship of four financial indicators and real GDP per capita, the growth of physical capital accumulation per capita<sup>8</sup> and a residual efficiency term. Three of the financial sector indicators are financial depth variables, banking sector liquidity to GDP (specifically, deposit money banks' assets as a ratio of GDP), stock market turnover to GDP and financial institutions' liquid liabilities to GDP. As a financial structure indicator, we use the concentration of the banking market measured as the share of assets of the three largest banks in total banking sector assets.

<sup>8</sup> Real GDP is taken from the Penn World Tables 6.0. Comparable capital stock data, however, are not available for the investigated country sample. We calculate capital stock data via the perpetual inventory method assuming a depreciation rate of 10% and making the assumption that capital grows at a constant rate equal to the growth rate of GDP (one of Kaldor's "stylized facts").



Real GDP growth per capita is decomposed into the growth of physical capital accumulation per capita and a residual efficiency term via the following equation  $DRGDPL = DCAPITAL^\alpha \times DEFF$  with  $DRGDPL$  being the growth rate of real GDP per capita,  $DCAPITAL$  the growth rate of physical capital accumulation per capita and  $DEFF$  the growth rate of the residual efficiency term.  $\alpha$  is assumed to be 0.3 in our cross-country regressions. 0.3 implied a relatively good fit to the data and experimenting with other parameter values did not affect our results considerably.

Growth of real GDP per capita as well as the growth of physical capital accumulation and the residual efficiency term are regressed in turn on banking sector concentration and financial depth indicators (banking sector liquidity to GDP, stock market turnover to GDP, liquid liabilities to GDP). The conditioning information set comprises the initial real GDP per capita (real GDP per capita in 1990, i.e. the first year of the observation period), initial education of the working age population (in particular the the people aged between 15 and 65 with secondary schooling as share of the total working age population<sup>9</sup>) and the openness of the economy in terms of the share of exports plus imports on GDP. Conditioning information needs to be incorporated as for example relatively advanced economies have different growth prospects than developing countries. Other indicators we considered, in particular foreign bank penetration, proved not to be significant.

### 2.2.1 On the Whole Banking Sector Concentration Appears to Negatively Affect Economic Growth<sup>10</sup>

#### Financial Depth Is Significantly Correlated with Economic Growth

Our sample consists of 45 developing and developed countries. Cross-country regressions<sup>11</sup> show financial depth is strongly correlated with real GDP per capita as well as capital accumulation and residual efficiency. Financial depth indicators are also significantly and positively correlated among themselves. Stock market liquidity appears to be of less importance than banking sector liquidity. Stock market turnover is significantly correlated with the residual efficiency term only. However neither concentration of banks nor efficiency of banks shows a significant correlation with real GDP per capita or the other sources of growth.

#### Cross-Country Evidence Points to a Negative Growth Impact of Concentration

Cross-country regressions confirm that the financial depth measures (banking sector liquidity to GDP and stock market turnover to GDP) are significantly linked to the long-run growth of real GDP per capita. However, additionally they reveal that there is a significant and negative statistical impact of concentration on the growth of real GDP. The evidence, though, does not seem to be robust across specifications. Initial income has – as expected – a negative growth contribution. Initially rich countries

<sup>9</sup> Human capital data are taken from Barro and Lee (2001). The data set comprises observations at five-year intervals from 1960 to 1999 and was linearly interpolated for our analysis.

<sup>10</sup> Tables reporting the empirical results can be found in the appendix.

<sup>11</sup> The cross-country regressions and the correlation exercise are based on averages calculated for all variables for the 1990s.

grow on a flatter growth path than initially poor countries. The specification above – with the positive impact of financial indicators and the negative impact of initial real GDP per capita can also be interpreted as the influential “*Gerschenkron hypothesis*.” Gerschenkron (1966) argued that moderately backward countries relied particularly heavily on financial intermediation during the early phases of industrialization, while they could finance themselves more readily from internal sources in later stages of industrialization. Furthermore, backward countries were able to adopt technologies from developed nations and hence could modernize faster. At the same time, they needed institutions capable of mobilizing huge financial funds from disparate sources. Finally, the openness of the economy has a small but significant influence on long-run economic growth.

#### **Physical Capital Accumulation Is Hampered Most by Concentration**

With respect to the growth of physical capital accumulation, a much stronger and again negative impact of concentration on physical capital growth was found. The growth impact appears to be about double the size in comparison to what was found for real GDP growth per capita. Furthermore the impact is robust across different specifications. In theoretical models the depressing effect of concentration on capital accumulation works through either credit rationing or excessive monitoring of firms as entrepreneurs may have an incentive to take excessive risk where loan rates are comparatively high. Financial intermediation in terms of banking sector liquidity matters. However, no evidence for the importance of stock market liquidity was found.

#### **Residual Macroeconomic Efficiency is Positively Linked to Stock Market Turnover**

As regards the residual efficiency, i.e. growth sources not captured by physical capital accumulation, concentration did not matter. With respect to the financial depth indicators, stock market turnover was found to have positive growth impacts while initial income per capita turned out to exert a negative impact. Hence, countries with initially lower income have a higher growth potential.

In sum, the cross-country regressions reveal that (1) financial depth indicators matter for long-term growth. Measures of liquidity have a significant link to the sources of growth. With respect to the relative importance of banks and capital markets, it appears that the impact of stock markets is somewhat weaker and exerts a positive influence mainly on the residual efficiency, i.e. growth sources other than physical capital accumulation. (2) Financial structure in terms of concentration of banks matters. The influence is robust and appears to be significant for at least physical capital accumulation. Furthermore the impact is negative, i.e. increasing concentration hampers long-term economic growth prospects. (3) The initial level of economic development of a country is also important in determining its long-run growth path. Above all the starting value of real GDP per capita is linked negatively to the long-run growth path. Hence, initially rich countries grow at a slower pace than initially poor countries. While the openness of an economy positively affects growth prospects it appears to be of comparatively low (but significant) importance for the sources of growth.

**The Indirect Effect of Concentration Is Positive and Depends on the Stage of Economic Development**

When interaction terms are incorporated, it appears that banking sector concentration has a positive impact on real GDP growth. The higher the initial real GDP per capita is, the more favorable banking sector concentration is for growth prospects. There are forces at work which place developing nations with a comparatively concentrated banking sector at a disadvantage. Additionally liquid liabilities have a positive direct impact on real GDP growth while the indirect effect via initial real GDP per capita is negative. Hence, financial sector liquidity is particularly important in early stages of economic development. This again provides support for the Gerschenkron hypothesis which presupposes that the banking sector was crucial for countries in its early phases of industrialization. For instance, the British local banks had a pivotal role in funding manufacturing in the first half of the 19<sup>th</sup> century. As local banks were more exposed to banking crises they began to spread their activities geographically with the consequence of increasing banking sector consolidation. According to Mayer (2000) there were 459 banks in the United Kingdom in 1850. By 1920, this number had diminished drastically, with just 5 banks (Barclays, Lloyds, Midland, National Provincial and Westminster) accounting for about 80% of English bank deposits.

**3 Economically More Advanced Countries Suffer Less from the Negative Growth Impacts of Banking Sector Concentration**

This paper studied the link between a range of indicators of financial structure and size with long-term economic growth. A particular emphasis was placed on financial structure indicators measuring the specific organization of the financial system as opposed to depth indicators, which basically measure financial market liquidity.

The preliminary findings are:

- (1) The concentration of banks was found to have a detrimental impact on growth. However, concentration may also have indirect and positive impacts on growth, depending on a country's initial stage of economic development. For initially more developed countries, the negative impact of concentration on long-run growth is lower. This is not a counterintuitive result. For instance Petersen and Rajan (1995) have shown theoretically that in a concentrated banking sector long-term risky projects have a higher chance of getting funded. Additionally, investor protection – more likely to be established in a more developed country – provides an independent positive growth impact. In fact Gónzales (2003) provides empirical evidence that countries with stronger investor protection and a concentrated banking sector benefit from a growth-enhancing lengthening of the maturity structure of debt.
- (2) Financial liquidity indicators, which work through both physical capital accumulation and total fac-

tor productivity, have a strong impact on economic growth. The catalyst role of banks appears to be particularly important in earlier phases of economic development. The separation of the relative importance of banks and stock markets was less successful. Weak evidence could be provided that stock markets are growth enhancing mainly via total factor productivity.

- (3) Initial real GDP per capita determines the growth path of an economy. Low initial real GDP is positively related to the growth path of economies in terms of the “late-comer advantage.” The openness of the economy has a positive growth effect.

History has shown that sometimes there may be a tradeoff between con-

centration and competition in the financial sector as more concentration occasionally tends to enhance financial sector stability at the expense of the diversity and innovation of services. Hence, a tentative policy conclusion would be that financial supervisors should carefully examine the constantly changing financial systems. The goal of antitrust authorities should be to maintain competitively structured markets. In order to increase competition in an environment subject to mergers that significantly reduce the number of providers for financial services, obstacles to the mobility of customers should be removed. This could be done for example by setting and enforcing transparency rules regarding products and prices for financial services.

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## Appendix

Table 1

### Correlations of the Average Growth Rate of Real GDP Per Capita and Financial Market Indicators: Average of 1990–1997

Growth indicator	Financial structure		Financial depth indicators			Efficiency of banks
	Bank concentration	Foreign bank penetration	Banks	Stocks	Total intermediation	
DRGDPL	-0.07 (0.68)	0.01 (0.48)	0.43*** (0.001)	0.16 (0.14)	0.51*** (~0)	0.04 (0.40)
DCAPITAL	-0.11 (0.76)	0.30** (0.02)	0.28** (0.02)	-0.14 (0.83)	0.26** (0.04)	-0.05 (0.64)
DEFF	-0.07 (0.68)	-0.29 (0.98)	0.24** (0.05)	0.43*** (0.001)	0.34*** (0.01)	-0.01 (0.54)

Note: p-values in brackets. \*\*\* significant at 0.01 level. \*\* significant at 0.05 level.

DRGDPL = growth rate of real per capita GDP, DCAPITAL = growth rate of physical capital accumulation per capita, DEFF = growth rate of residual efficiency (see section 2.2), Bank concentration = share of assets held by the three largest banks, Foreign bank penetration = share of assets foreign banks hold in total bank assets, Banks = deposit money banks' assets to GDP, Stocks = stock market turnover to GDP, Total intermediation = currency plus demand and interest-bearing liabilities of banks and other financial intermediaries divided by GDP, Efficiency of banks = Net interest rate margin.

Table 2

### Cross-Country Regressions of Real GDP Growth Per Capita on Contemporaneous Financial Indicators, Cross-Country: 1990–1997

Dependent variable	Structure		Financial depth indicator			Conditioning variables	
	Constant	Concentration	Banks	Stocks	Total intermediation	RGDPL	Other
DRGDPL	0.086** (0.04)	-0.017 (0.42)			0.007 (0.55)	-0.007 (0.15)	0.0001** (0.05)
R <sup>2</sup> = 0.15							
DRGDPL	0.046 (0.44)	-0.038* (0.07)	0.035* (0.10)			-0.006** (0.41)	0.038 (0.24)
R <sup>2</sup> = 0.18							
DRGDPL	0.081** (0.04)	-0.002 (0.92)		0.016*** (0.0001)	0.001 (0.94)	0.001 (0.94)	-0.007 (0.15)
R <sup>2</sup> = 0.13							

Note: p-values in brackets; standard errors are corrected for heteroscedasticity according to White.

\*\*\* significant at 0.01 level. \*\* significant at 0.05 level. \* significant at 0.10 level.

DRGDPL = growth rate of real per capita GDP, Banks = deposit money banks' assets to GDP, Stocks = stock market turnover to GDP, Total intermediation = currency plus demand and interest-bearing liabilities of banks and other financial intermediaries divided by GDP, RGDPL = log of initial real GDP per capita, Other = Open (= ratio of exports plus imports to GDP) and School (= log of initial secondary school enrolment rate).

Table 3

### Cross-Country Regressions of Growth of Physical Capital Accumulation Per Capita on Contemporaneous Financial Indicators, Cross-Country: 1990–1997

Dependent variable	Structure		Financial depth indicator			Conditioning variables	
	Constant	Concentration	Banks	Stocks	Total intermediation	RGDPL	Other
DCAPITAL		-0.082*** (0.004)	0.057** (0.03)				
R <sup>2</sup> = 0.26							
DCAPITAL	0.019 (0.52)	-0.098*** (0.004)	0.047 (0.21)	-0.009 (0.45)			
R <sup>2</sup> = 0.29							
DCAPITAL	-0.008 (0.82)	-0.095*** (0.002)	0.033 (0.41)				0.045 (0.17)
R <sup>2</sup> = 0.32							

Note: p-values in brackets; standard errors are corrected for heteroscedasticity according to White.

\*\*\* significant at 0.01 level. \*\* significant at 0.05 level.

DCAPITAL = real per capita growth rate of physical capital accumulation. Banks = deposit money banks' assets to GDP, Stocks = stock market turnover to GDP, Total intermediation = currency plus demand and interest-bearing liabilities of banks and other financial intermediaries divided by GDP, RGDPL = log of initial real GDP per capita, Other = Open (= ratio of exports plus imports to GDP) and School (= log of initial secondary school enrolment rate).

Table 4

**Cross-Country Regressions of Residual Efficiency Growth on Contemporaneous Financial Indicators, Cross-Country: 1990–1997**

Dependent variable	Structure		Financial depth indicator			Conditioning variables	
	Constant	Concentration	Banks	Stocks	Total intermediation	RGDPL	Other
DEFF	0.08***	0.011			0.007	-0.008**	0.00003
R <sup>2</sup> = 0.10	(0.03)	(0.61)			(0.54)	(0.05)	(0.84)
DEFF	0.095***	0.013		0.018***		-0.009***	0.00003
R <sup>2</sup> = 0.50	(0.01)	(0.57)		(0.002)		(0.01)	(0.82)

Note: p-values in brackets; standard errors are corrected for heteroscedasticity according to White.

\*\*\* significant at 0.01 level. \*\* significant at 0.05 level.

DEFF = residual of real per capita GDP growth after accounting for the rate of physical capital accumulation, i.e.  $DEFF = DRGDPL - 0.3 DCAPITAL$ , Banks = deposit money banks' assets to GDP, Stocks = stock market turnover to GDP, Total intermediation = currency plus demand and interest-bearing liabilities of banks and other financial intermediaries divided by GDP, RGDPL = log of initial real GDP per capita, Other = Open (= ratio of exports plus imports to GDP) and School = (= log of initial secondary school enrolment rate).

Table 5

**Cross-Country Regressions of Real GDP Growth Per Capita on Contemporaneous Financial Indicators Taking Account of Interdependence Indicators, Cross-Country: 1990–1997**

Dependent variable: Growth of real GDP per capita

Independent variable	OLS	
Constant	0.10**	(0.05)
RGDPL	0.01	(0.12)
LIQUIDITY	0.18***	(0.01)
CON	0.22***	(0.01)
CON × RGDPL	0.025***	(0.01)
LIQUIDITY × RGDPL	0.019***	(0.01)
R <sup>2</sup>	0.52	

Note: p-values in brackets; standard errors are corrected for heteroscedasticity according to White.

\*\*\* significant at 0.01 level. \*\* significant at 0.05 level.

RGDPL = log of initial real GDP per capita, LIQUIDITY = currency plus demand and interest-bearing liabilities of banks and other financial intermediaries divided by GDP, CON = the ratio of the three largest banks' assets to total banking sector assets.

# The Role of Bank Lending in Market-Based and Bank-Based Financial Systems

Sylvia Kaufmann,  
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*Theoretical models of the role of credit in business cycles and of the transmission mechanism have largely concluded that, given capital market imperfections, credit conditions may amplify and propagate the effect of shocks in the economy. This paper compares the behavior of loans to households and loans to nonfinancial corporations in Austria, Germany, the Netherlands and the United Kingdom. Analyzing credit aggregates in these countries in a framework accounting for diverging economic environments allows for an assessment of how the amplifying and asymmetric effects of credit aggregates differ between market-based and bank-based financial systems. The results show that the state of the economy impacts the way in which shocks are propagated through credit markets. The effects of shocks are smoothed over time in bank-based financial systems irrespective of the economic environment and in market-based systems only during periods of subdued economic growth or tight liquidity conditions. During economic recoveries we observe an amplifying effect in market-based systems. Thus, the deceleration in credit growth in the above-mentioned countries between 1999 and 2003 was mainly demand-side rather than supply-side driven, given the overall slowdown of the economy.*

## I Credit Markets and the Transmission Mechanism

Credit aggregates not only play an important role in the transmission mechanism of monetary policy in general (Bernanke and Blinder, 1988), but they may also be an important indicator of the monetary stance and liquidity conditions at the national level. This may be especially relevant for countries with an exchange rate peg or members of a monetary union, where the interest rate level or “national” monetary aggregates may have lost leading indicator properties, while “national” credit aggregates may still have a more direct impact on national spending and therefore on national inflation.

To date, empirical studies for the euro area that relate money and credit to business cycles concentrate chiefly on the cyclical properties of money, prices and interest rates of the euro area aggregate or of some large economies. Only very few studies focus on credit aggregates; moreover, countries like Germany and Austria are hardly ever included.

This paper summarizes evidence for the role of credit aggregates in

the transmission mechanism for Austria (AT), Germany (DE), the Netherlands (NL) and the United Kingdom (U.K.) obtained in Kaufmann and Valderrama (2004).<sup>1</sup> The analysis of these countries allows comparing potential differences in the propagating role of credit aggregates depending on the type of financial system.

Moreover, loans to households and loans to nonfinancial corporations are not only determined by different spending components but are also affected by asymmetric information and financial constraints in different ways. Owing to data availability, we can model these credit aggregates separately.

There is a large body of theoretical models which predict that, owing to the existence of asymmetric information, credit markets propagate shocks to the economy. Moreover, the procyclicality of bank lending results in an amplification of the business cycle – with this effect more pronounced during recessions – and thus leads to asymmetric effects of monetary policy over time. To capture this type of non-linearity, we use a Markov-switching vector autoregressive model

<sup>1</sup> See Jacobs and Kakes (2001) and Sensier et al. (2002) for similar studies featuring the Netherlands and the U.K., respectively.



(MS-VAR). In this model, parameters switch according to an unobservable state variable that is assumed to capture changing credit or economic regimes and is estimated together with the model parameters.

The paper is organized as follows: The next chapter motivates the use of non-linear modeling based on theoretical models of credit cycles. Chapter three describes some stylized facts about the evolution of credit aggregates and the institutional framework of the four countries included in the study. Chapter four discusses the methodology and empirical evidence. Our conclusions round out the paper in chapter five.

## 2 Asymmetric Effects of Credit Markets over the Business Cycle

There is a large body of theoretical and empirical models that assign a significant role to credit aggregates in the transmission mechanism of monetary policy and which relate not only money but also credit to business cycles. Despite their different approaches, all coincide in predicting that owing to the existence of credit market imperfections, such as asymmetric information, credit markets propagate shocks to the economy.

In these models, business cycles are amplified through borrowers' balance sheets (this is referred to as the financial accelerator effect).<sup>2</sup> During economic upturns borrowers' improving net worth reduces agency

costs and therefore the cost of external finance, which in turn results in higher investment. By contrast, during downturns, due to the lack of internal financing, credit constraints restrict investment. This negative effect is larger than the positive effect during upturns. It is even stronger when we take the possibility of debt default into account.<sup>3</sup> In this type of model, higher debt default during a recession leads to exaggerated responses of the economy to an initial liquidity shock.

Thus, the pro-cyclicality of bank lending results in an amplification of the business cycle, which is more pronounced during recessions, and consequently leads to asymmetric effects of monetary policy shock or of any other shock over the business cycle. These types of models also imply that monetary policy affects the economy not only through the interest rate channel but also through credit aggregates and balance sheets.

Empirical studies at the aggregate level have confirmed this hypothesis, showing that credit aggregates and the composition of external funds react to liquidity shocks and in turn affect investment behavior.<sup>4</sup>

Empirical evidence at the individual bank and firm level for the four countries chosen in this study tends to confirm the hypothesis that credit aggregates are relevant for the transmission mechanism and have asymmetric effects over the business cycle.<sup>5</sup>

<sup>2</sup> Bernanke and Blinder (1988) and Bernanke and Gertler (1989).

<sup>3</sup> Kiyotaki and Moore (1997a, 1997b) and Koehlerlakota (2000).

<sup>4</sup> Bernanke and Blinder (1989), Kashyap et al. (1993), Bernanke and Gertler (1995) and Christiano et al. (1996).

<sup>5</sup> See Austria: Frühwirth-Schnatter and Kaufmann (2004), Kaufmann (2003), Valderrama (2001, 2003a) and Wesche (2000); Germany: Vermeulen (2002), Chatelain et al. (2003) and von Kalckreuth (2003); the Netherlands: van Ees and Garretsen (1994) and van Ees et al. (1999); the United Kingdom: Guariglia (1999) and Hall (2001).

### 3 Credit Aggregates in Market-Based and Bank- Based Financial Systems

Modeling credit aggregates for four EU countries with different financial systems allows us to investigate whether the role of credit aggregates in the transmission mechanism depends on the institutional framework. In particular, we expect that owing to the “house bank” principle characteristic of bank-based systems, credit constraints and asymmetric propagation through credit markets may be less severe than in market-based systems.

Thus, although the level of indebtedness is usually higher in bank-based systems, debt default occurs less frequently owing to the existence of close lending relationships. This house bank principle allows both lenders and borrowers to overcome some of the asymmetric information problems found in imperfect capital markets by building long-standing relationships. Thanks to these lending relationships borrowers are less dependent on internal funds, since lenders will provide their clients with liquid funds even during an economic downturn. As a result, borrowers can smooth spending decisions over the cycle, as lending in this case is mostly demand driven.<sup>6</sup>

Evidence at the firm level confirms that the advantage of lending relationships comes from a lower dependence on internal funds and not through lower cost of capital.<sup>7</sup> At the aggregate level, relationship lending

should translate into smoother business cycle fluctuations or smoother credit cycles. To test this hypothesis, we compare results for Austria, Germany, the Netherlands and the U.K., i.e. two small and two large countries in the EU representative of bank-based and market-based financial systems.

Austria and Germany have very similar banking systems that are characterized by close lending relationships.<sup>8</sup> The U.K., by contrast, is a market-based financial system with the highest market capitalization in Europe, while the ratio of loans to nonfinancial corporations to GDP is low compared with other EU countries. It is not easy to find a small country in Europe with a market-based system. The best candidate is the Netherlands, showing a high share of stock issues and a substantial market capitalization compared with most other countries in Europe. Market capitalization in the Netherlands is the third highest of the 15 EU countries after the U.K. and Luxembourg.<sup>9</sup> Although lending relationships may also be present in the Netherlands and the U.K.,<sup>10</sup> at the aggregate level, the effect is expected to be smaller than in Austria and Germany.

Charts 1 and 2 largely confirm this perception. The ratio of loans to GDP for the household sector is larger in the U.K. and the Netherlands, which reflects the rapid liberalization of bank lending to consumers during the 1990s. In contrast, the ratio of

<sup>6</sup> See Ongena and Smith (1998) and Boot (2000) for a more detailed account of all possible effects of lending relationships.

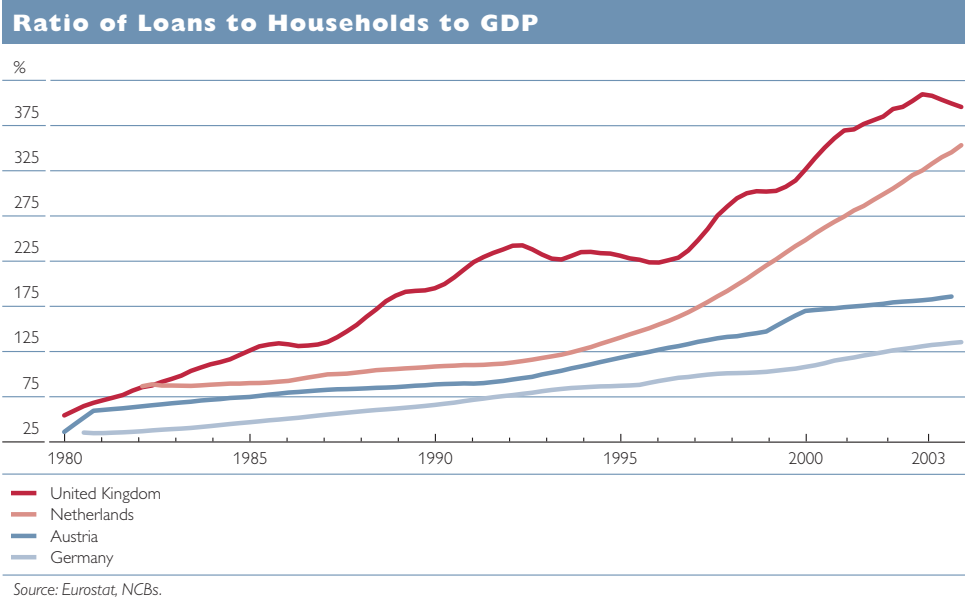
<sup>7</sup> Petersen and Rajan (1994, 1995), Ongena and Smith (1998), Houston and James (1999), Boot (2000).

<sup>8</sup> Evidence for Germany is extensive, see for example Chirinko and Elston (1996), Elsas and Krahnert (1998) and Harhoff and Körting (1998); for evidence for Austria, see Valderrama (2001, 2003a and 2003b).

<sup>9</sup> Data for 2000. See Rajan and Zingales (2003).

<sup>10</sup> See van Ees and Garretsen (1994), van Ees et al. (1998) and de Haan and Sterken (2002) for the Netherlands.

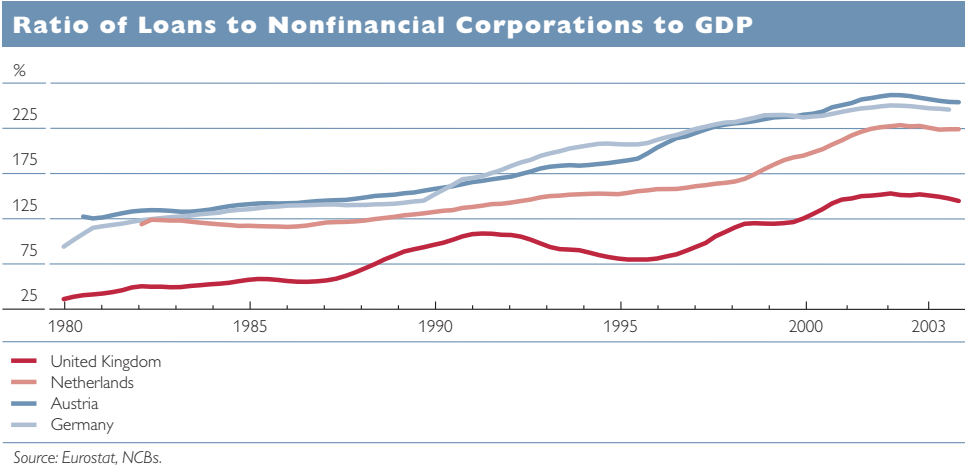
Chart 1



loans to GDP for nonfinancial corporations is quite high in Austria and Germany compared with the relatively low level in the U.K., while

the Netherlands are somewhere in-between. This is consistent with the higher market capitalization observed in both the U.K. and the Netherlands.

Chart 2



In the same fashion, we observe that the ratio of loans to GDP increases steadily in most countries except in the U.K. This is again consistent with the hypothesis that in the absence of long-term lending relationships, credit aggregates tend to be more volatile.

#### 4 Empirical Estimates Confirm Asymmetric Effects of Lending

In order to test whether credit markets propagate and amplify shocks to the economy and whether they do so in an asymmetric manner, we use a non-linear model of credit systems for households and nonfinancial corporations for four EU countries with

differing financial systems (see box below for a description of the methodology).

In the light of the well-known identification problem,<sup>11</sup> we do not attempt to discriminate between loan demand and supply. The system describing loans to nonfinancial corporations includes (in that order) investment, imports, the CPI and the three-month interest rate.<sup>12</sup> The sys-

tem describing lending to households includes consumption, net disposable income, the CPI, loans to households and the short-term interest rate. We use quarterly seasonally adjusted data covering the period from the first quarter of 1980 up to the last quarter of 2002. The effective sample period is adjusted to the country-specific data length.

### Model and Estimation<sup>13</sup>

*In order to capture the non-linear dynamics predicted by theoretical models, we estimate a Markov-switching vector autoregressive model (MS-VAR), which allows for regime switching coefficients. Under the most general specification all model parameters may depend on the unobservable state  $s_t$ :*

$$y_t = v(s_t) + A_1(s_t)y_{t-1} + A_2(s_t)y_{t-2} + \dots + A_q(s_t)y_{t-q} + \varepsilon_t, \varepsilon_t \sim i.i.d.N(0, \Sigma(s_t)),$$

*where  $s_t$  can take a value of 1 to K and the probability of being in any regime conditional on the past regime is constant and exogenous. The method used here allows estimating the dates of the regime shifts and the model parameters simultaneously. Thus, it is not necessary to have any a priori knowledge about the dates in which the economy shifts into a different regime.*

*The estimation is cast into a Bayesian framework and the inference is obtained by using Markov Chain Monte Carlo (MCMC) simulation methods. Thus, the inference on the joint posterior distribution of the parameters and the state variable is obtained by iteratively simulating the parameters and the path of the state variable out of their conditional posterior distribution.*

*Based on explorative tools, such as scatter plots and marginal posterior distributions of the simulated values of the state-specific parameters, we find a restriction that identifies the states. We also find which parameters are not switching or which are insignificant and can be restricted to zero. Finally, we test this specification against a linear alternative by means of the Bayes factor.<sup>14</sup>*

*The final model is used to compute state-dependent impulse response functions, whereby the structural model is identified by means of a Cholesky decomposition of the respective (state-dependent) covariance matrix. We obtain the distribution of the impulse responses by using draws of the simulations to compute the related impulse responses.*

#### 4.1 Market Imperfections Affect Households and Firms Differently

In order to determine whether these systems are better modeled in a non-linear framework, we first estimate an unrestricted version of each model with two lags, where all parameters

are switching. Based on this benchmark estimation, we restrict those parameters which are not switching to be equal across regimes and those which are insignificant to be zero.

The unrestricted and the final specifications are also tested against a non-

<sup>11</sup> We carry out the analysis by using observations on credit growth and interest rate changes. The movements in these variables do not tell us anything about whether they are due to changes in supply or demand.

<sup>12</sup> We chose the short-term interest rate because we were interested in studying the effects of monetary policy and also because a substantial part of loans are extended with a variable interest rate clause. For Austria in particular, the data (available only since 1995) show that lending rates follow the short-term interest rate more closely than the long-term interest rate.

<sup>13</sup> See Kaufmann and Valderrama (2004) for a detailed and technical description of the modeling strategy.

<sup>14</sup> Twice the difference of the log of the marginal likelihood is interpretable on the same scale as the well-known likelihood ratio test with  $X^2$  distribution.

switching specification by means of the Bayes factor.<sup>15</sup> The tests show that in all four countries and for both households and nonfinancial corporations, a linear system is rejected against our non-linear restricted specification.

Since the switching in this type of model is estimated simultaneously

with the parameters of the system, it is the relationship among these variables which drives the regime switching. Thus, we expect to relate the states of the economy obtained in each system to specific economic periods or to specific credit regimes.

Table 1

Regimes Related to			
	Nonfinancial corporations		Households
AT		Economic conditions	Conditions in credit markets
DE		Economic conditions	Conditions in credit markets
NL		Conditions in credit markets	Economic conditions
UK		Economic conditions	Conditions in credit markets

Table 1 relates the periods of the regimes to economic and credit market conditions for each system. In all countries, except the Netherlands, the switch in regimes of nonfinancial corporations is driven by economic conditions, while for loans to households it can be related to conditions in the credit market.

These results are consistent with the hypothesis that market imperfections, such as asymmetric information and moral hazard, affect households and firms in different ways. In fact, lending to households is expected to be driven more strongly by supply and less by lending relationships. In particular, these countries saw a process of financial liberalization during the period under study that was accompanied by a rapid growth of consumer credit. This also explains the decoupling of lending to households from the business cycle.

In the following subsection we assess the propagating role of credit aggregates and examine whether the response to shocks is asymmetric between regimes. To this end, we turn to the estimated impulse responses.

#### 4.2 Asymmetric Effects of Lending Depend on the Structure of the Financial System

The effects of lending on the spending variable in our eight credit systems depend on the country-specific financial system (see table 2). As expected for bank-based systems, where the house bank principle prevails, lending does not influence investment in either regime. The effect is, however, asymmetric in market-based financial systems. In the systems for loans to households, we find exactly the opposite to be the case.

Thus, as expected, in bank-based financial systems lending to nonfinancial corporations neither propagates nor amplifies shocks, while lending to households affects consumption. In particular, we observe that lending amplifies shocks in times of rapid credit growth, while it does not in the regime where credit growth is subdued.

The results for market-based financial systems show exactly the opposite situation. We find that lending to nonfinancial corporations has procyclical effects during “normal” economic conditions whereas it has an in-

<sup>15</sup> See footnote 14.

Table 2

Effects of Lending on the Spending Variable		
	Nonfinancial corporations	Households
AT	Investment not driven by lending	Asymmetric effect on consumption
DE	Investment not driven by lending	Asymmetric effect on consumption
NL	Asymmetric effect on investment	Consumption not driven by lending
UK	Asymmetric effect on investment	Consumption not driven by lending

significant effect on investment during downturns. Thus, even in market-based financial systems, there seems to be some kind of lending relationship that shields businesses from liquidity conditions during an economic slowdown.

The fact that consumption is not affected by credit markets in market-based systems may be due to the inclusion of mortgage loans. In bank-based systems, we find that lending to households also increased in the

second half of our sample in the wake of financial liberalization.

Table 3 summarizes the response of lending to the spending variable for the eight credit systems estimated. The response of lending to nonfinancial corporations again depends on the country-specific financial system and corroborates the hypothesis that in bank-based systems lending is mainly demand driven. In the case of loans to households it is not possible to draw a clear conclusion.

Table 3

Response of Lending to the Spending Variable		
	Nonfinancial corporations	Households
AT	Demand driven	No reaction to consumption
DE	Demand driven	Asymmetric
NL	Asymmetric	No reaction to consumption
UK	Asymmetric	Demand driven

#### 4.3 The Interest Rate Has Asymmetric Effects on Spending

Using a credit system allows us to investigate the interest rate channel. As stated by the credit view of the transmission mechanism, the effect of interest rate changes on investment and consumption is in many cases insignificant (see table 4). However, we find that the interest rate effect differs between regimes. Thus, both credit aggregates and the interest rate have asymmetric effects on lending and on spending variables.

It is worth mentioning that while we can characterize the effect on spending variables by the country-specific financial system, lending reacts differently to the interest rate. It is evident from table 5 that, while asymmetric effects in bank-based systems are only found for consumption, in market-based systems such effects are only found for investment. This is reflected in the insignificant response of investment in bank-based systems and of consumption in market-based systems.

Table 4

Effects of the Interest Rate on the Spending Variable		
	Nonfinancial corporations	Households
AT	No effect on investment	Asymmetric effect on consumption
DE	No effect on investment	Asymmetric effect on consumption
NL	Asymmetric effect on investment	No effect on consumption
UK	Asymmetric effect on investment	No effect on consumption

Table 5

Effects of the Interest Rate on Lending				
	Nonfinancial corporations		Households	
AT		Asymmetric		Insignificant
DE		Asymmetric		Asymmetric
NL		Positive		Asymmetric
UK		Asymmetric		Asymmetric

## 5 Policy Implications

The results we obtain for two regimes in each country can be related to periods of different economic conditions or to periods of different conditions on the credit market.

For Austria and Germany, the two countries in our sample that represent bank-based financial systems, we find that lending to nonfinancial corporations propagates shocks to the economy, but neither amplifies them nor constrains economic activity in periods of subdued growth or tight liquidity conditions. This confirms the smoothing role of the house bank principle. For households we find that lending does not restrict consumption. However, the evidence is less clear-cut due to the inclusion of mortgage loans in lending to households.

In the two countries representing market-based financial systems we find evidence for a financial accelera-

tor<sup>16</sup> effect in the firm sector and, particularly for the U.K., also a strong pro-cyclical effect of credit markets during periods of economic recovery. The evidence for the household sector is less significant as the acceleration of lending during the 1990s was used to finance residential and financial investment rather than consumption.

In summary, we find evidence for credit markets acting as shock propagators and having non-linear effects on the real economy. In bank-based systems the effects of shocks are smoothed, while in market-based systems we observe an amplifying effect during favorable economic conditions. However, we find that in periods of subdued economic growth or tight credit conditions, the responses are similar to those found for bank-based financial systems, i.e. credit constraints do not become binding.

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<sup>16</sup> Refers to response of credit market conditions to “shocks” to the economy that may amplify and spread the effect of the shocks. For example, credit may become harder to obtain for households and firms in an economic downturn, which can intensify and prolong the downturn.

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# HIGHLIGHTS

# Growth and Stability in the EU: Perspectives from the Lisbon Agenda – Results from the 32<sup>nd</sup> Economics Conference

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Helene Schubert

## Introduction

The double challenge of population aging and increasing global economic competition has put structural reforms with a view to fostering and securing sustainable long-term growth high on the agenda of every European country. Structural reforms in areas such as research and innovation policies, education and training as well as market regulation are acknowledged to have major economic implications, e.g. for growth, employment and public finances. However, a few months before the upcoming mid-term review of the Lisbon agenda, which was drawn up in 2000 and which aims at making the European Union (EU) the world's most competitive and dynamic economy by the year 2010, it is evident that structural reforms are lagging behind the ambitious Lisbon goals. The 32<sup>nd</sup> Economics Conference of the Oesterreichische Nationalbank (OeNB), which took place in Vienna on May 27 and 28, 2004, centered on two broad issues, namely on the main reasons behind the lack of delivery of the Lisbon goals, and on the question whether there is room for improvement for the Lisbon strategy in general.

The conference was divided into three sessions. Session 1 was dedicated to strategies to achieve the Lisbon goals. Session 2 dealt with the implications of structural changes for financial markets and monetary policy. Session 3 focused on the main challenges ahead.

## Reforms to Foster Long-Term Economic Growth

In his opening speech, *Klaus Liebscher*, Governor of the OeNB, particularly emphasized the successful efforts of EU Member States over the last decades to build up a modern and com-

petitive economic environment. The completion of the Single Market and, most recently, EU enlargement constitute significant cornerstones in the European integration process. The Lisbon agenda agreed upon by the European Council in March 2000 is of particular importance as it generates the preconditions for sustainable high-quality jobs and social cohesion in a larger union. Governor Liebscher mentioned that after some years of moderate reform progress the more favorable cyclical environment combined with low inflation should facilitate the further implementation of structural reforms to achieve the Lisbon goals. Setting clear priorities and defining clear responsibilities is crucial to make Lisbon a success. Finally, Governor Liebscher stressed the significant role of communicating structural reforms in an appropriate way in order to increase public acceptance of reforms.

*Martin Bartenstein*, the Austrian Federal Minister of Economic Affairs and Labor, reviewed the major achievements Europe has made in terms of job creation and new technologies manifested for instance in today's widespread dissemination of Internet in schools. However, 18 million of unemployed people and the low growth suggest that Europe is running the risk of de-industrialization. More supply-side, rather than demand-side, policies are required to effectively counter this risk. In this respect, Bartenstein reviewed the recent reform initiatives in Austria, such as the pension reform and the group taxation scheme, and mentioned that Austria is ranked no. 3 regarding the implementation of the Lisbon goals. He mentioned in particular the female employment rate, which has considerably increased in recent years and now stands at a

level above the Lisbon goal of 60%; the employment ratio of the elderly is still below the Lisbon goal of 50%, though.

In his keynote speech, Commissioner *Mario Monti* of the European Commission stressed the importance of the Lisbon strategy as a guiding principle for policies. The goals have perhaps been too ambitiously expressed but the challenges ahead require their timely implementation. As caveats he mentioned unsatisfactory mainstreaming of the policies and insufficient “teeth of implementation.” In analogy to the Stability and Growth Pact, which derives its economic justification from negative externalities of excessive budget deficits of individual Member States in the monetary union, Monti held the view that structural policies are also associated with externalities. As a consequence, he mentioned that the Lisbon agenda, which is more widely shared in terms of objectives in comparison with the Stability and Growth Pact, should be more binding. Furthermore, he stressed the interrelations between the Lisbon process and other areas of economic policy, such as industrial policies and policies fostering competitiveness. He claimed that Europe should play a more active role in promoting industrial development by putting greater emphasis on industrial policies that prevent in particular fragmentation of national markets and violation of the Single Market principle. Finally, he said to expect a smooth decision-making process owing to the Constitutional Treaty, which should positively contribute to growth.

### **Session I: Strategies to Achieve the Lisbon Goals**

While the Lisbon goal of enhanced growth is not an end in itself, it nevertheless has to be at the very top of the EU agenda to safeguard the sustainability of the European social model in the light of enlargement and aging. This was stressed by *André Sapir*, who highlighted the main policy recommendations provided in the Sapir Report that touch economic as well as institutional aspects. Starting from the observation that in the last 30 years the EU Member States have lost about one percentage point of potential output growth, Sapir argued that the Lisbon agenda is the right strategy since it addresses the shortcomings of the Single Market program that failed to boost economic growth. The Lisbon strategy maintains the completion of the Single Market, promotion of innovation and, most importantly, that the reallocation of factors of production is complemented by measures in labor and social policies. The main problems of the Lisbon strategy are the high level of coordination required, the lack of clear-cut responsibilities and the risk of free riding. Furthermore, too many objectives and instruments that are too weak are major impediments to reaching the Lisbon goals. The reform proposals of the Sapir Report are oriented towards institutional and budgetary aspects: The “open method of coordination” should focus its scope and strengthen its implementation, the EU budget has to be redirected towards knowledge investment, and greater attention has to be paid to the quality of national budgets. Sapir also mentioned the crucial importance of the upcoming months for overhauling the Lisbon process along the lines suggested.

The discussant *Dennis Snower* of the University of London addressed the shortcomings of labor market policies and underlined the crucial role tighter surveillance of the competitiveness of labor markets plays for achieving greater coherence between macro and labor policies. His controversial proposal to introduce unemployment and skill accounts can be regarded as part of a strategy to make labor markets more similar to financial markets.

While it is commonly agreed that human capital is an important source of growth, the issue which educational features are better suited to promote long-run growth is highly controversial. *Dirk Krueger* of the University of Pennsylvania argued that the European focus on vocational education is one reason behind the “technology deficit” observable since the 1980s. While the specialized and skill-specific training schemes common to many European countries were appropriate during the technologically calm times of the 1950s and 1960s, they may have hindered European technology adoption and economic growth from the 1980s onwards. Hence, reducing the growth gap of Europe vis-à-vis the U.S.A. requires educational reforms that place a greater emphasis on flexibility in educational choices to be made at the upper secondary level and focus more strongly on general education.

The Lisbon objective to raise the ratio of research and development to GDP to 3% requires an increase in the number of researchers in the EU by about 700,000. *Georg Winckler*, Rector of the University of Vienna, discussed the increased demands for more human resources against the background of financing restrictions on the part of the government. According to OECD estimates, industry funding

of university research is particularly high in the U.S.A. and the United Kingdom (with about 6% each), and in Canada with nearly 11%, but lower in European countries.

*Josef Christl* of the OeNB welcomed four eminent experts to the panel on “Successful Structural Reforms,” all of whom had closely followed the design and implementation of structural reforms in their home countries. *Monika Arvidsson* of the Swedish Trade Union Confederation claimed that structural reforms and deregulation aimed at increasing competition should yield the maximum possible advantages for consumers and citizens. Although many public operations, like procurement and network services (e.g. gas and electricity), have by now been liberalized and exposed to competition, she made a case for being restrictive about commercializing welfare services like schools and nursing, not least because of the sizeable failure risks involved. In Sweden, the rise in productivity has been accompanied by mounting prices, which means that some economic actors have reaped part of the consumers’ gain from the deregulation. On the other hand, competition policy does not aim at lower prices only; after all, Sweden, being a small open economy, is highly exposed to global competition. The accelerated growth in productivity has also been fostered by a policy towards low inflation, stable public finances and an improved efficiency in the use of resources. The reforms met with broad acceptance because wage earners felt cushioned by social insurance granted in case of a job loss due to rationalization. Besides supply-side measures, consideration should also be given to a balanced aggregate demand. Furthermore competition authorities should

be endowed with sufficient resources to enforce and monitor reforms to the consumers' advantage.

*Mads Kieler* of the Ministry of Finance of Denmark focused on taxation and labor market reforms. Presently, Denmark has one of the highest employment shares and GDPs per capita, irrespective of its tax ratio of about 50% (the tax base has been widened and there is symmetric income/capital taxation) and a generous welfare system for people affected by structural changes. Denmark's good performance is attributable to its designing flexible institutions, pursuing a highly active labor market policy and having centralized as well as decentralized wage bargaining. The reforms manifest themselves in a high participation rate of women and a wage distribution that has not widened. In particular, young people are entitled to unemployment benefits for a period of six months, after which time they have to take subsidized jobs or enroll in training programs. At the same time, the government introduced temporary leaves, parents' leave, sabbaticals and pre-early retirement for the long-term unemployed. Comprehensive social security systems are therefore not necessarily tantamount to rigid structures, nor do high taxes automatically reduce the labor supply. In Denmark, labor market participation is thought to be key to achieve long-run sustainability of public finances in an aging society. Even if productivity growth yields a higher tax base, future social insurance expenses will rise. Therefore, policymakers have been striving to match the stronger demand for skilled labor with an increase in the labor supply.

*Jussi Mustonen* of the Confederation of Finnish Industries and Employers observed that the reforms in the

early 1990s were a reaction to a severe crisis. At that time, it was commonly accepted that exploding public debt had to be brought under control. Expenditures were cut with promises of secure future social security benefits. Taxes were reduced to enhance investments and markets were fully liberalized before EU and EMU entry. This yielded above-EU-average productivity growth. Nevertheless, the pension reform was insufficient, with pension contributions relative to wage income decreasing after structural reforms. Increased global competition, not least due to EU enlargement, is the main challenge of today. Therefore, the current government has set up a strategy program to meet future challenges, which is entitled "Successful Finland in the future" and consists of target definitions for four pillars: labor markets, taxation, welfare systems, knowledge and R&D. These challenges are also a European issue, however. Unfortunately, the Lisbon strategy is somewhat unfocused and contains contradicting goals. To achieve the necessary reforms, cooperative solutions are the best to be implemented but the hardest to achieve.

*Erhard Fürst*, Federation of Austrian Industry, argued that generally the Lisbon agenda should be complemented by sustainability, not only in economic and social terms, but also on an ecological basis. He observed that, so far, small countries were more successful in implementing reforms. This might have been due to easier decision-making processes, corporatism, or to a stronger need to adapt in the face of the smaller domestic market. Nevertheless, in Austria the quality of public expenditures has deteriorated (investment cuts are obviously easier to implement than transfer cuts). Although Austrian trade unions

have traditionally been growth-oriented and therefore quite flexible with respect to companies' needs, structural reforms had been hard to implement until the end of 1980s. The current "reform government" was welcomed at first, but its acceptance has since then deteriorated. The government launched numerous reforms: the pension system was reformed, and R&D expenditures increased by ½ percentage point, promoted by a newly established National Foundation for Research, Technology and Development as well as by an improved tax treatment of R&D expenditures. At the educational level, a Fachhochschulen system was introduced, and the recent university reform is expected to create a framework for closer cooperation between academia and firms. Finally, a corporate tax reform lowered taxes for companies and improved group taxation. Still, according to Erhard Fürst, much has to be done: a health care reform is pending, the efficiency of the federal system is modest and there is no competition in municipal services' prices.

In his keynote speech, *Edgar Meister*, Deutsche Bundesbank, analyzed whether the new capital adequacy rules as proposed in the major revision of the international standard on bank capital adequacy, widely known as Basel II, would interfere with the goals of the Lisbon agenda. In particular, he dealt with the issue of whether the Basel II framework would financially constrain small and medium-sized enterprises (SMEs), a fear sometimes expressed in political debates. Meister argued that Basel II would generate positive macroeconomic effects that would help achieve the goals of the Lisbon agenda. Specifically, the new capital adequacy framework would strengthen the stability of

the financial system owing to the inherent incentives for banks to improve their risk management systems and practices. Moreover, Basel II would improve the allocation of capital by further reducing the gap between regulatory and economic capital. With respect to SMEs, he noted that the modified rules applying to SMEs would not restrict their access to credit. He further pointed out that the internal ratings-based (IRB) approach proposed in the Basel II framework forces banks and SMEs to increase their mutual exchange of information. This may lead to a "renaissance" of relationship banking, i.e. the "Hausbank" principle.

## **Session 2: Financial Markets and the Lisbon Strategy**

The introduction of the euro has promoted the integration of financial markets further, which should facilitate a smooth transmission of monetary policy to the real economy. However, as noted by *Nuvo Alves*, Banco de Portugal, heterogeneous structures still persist across the euro area countries. Alves investigated whether these persisting market frictions and fragmentations have an adverse effect on the conduct of monetary policy. He found that financial markets do not cause any significant distortions in the transmission of monetary policy. This surprising result, which is derived from a general equilibrium model with competitive financial intermediaries and frictionless financial markets that mimics the empirical features of the literature quite well, is tentatively attributed to three aspects: First, expectations regarding the future path of monetary policy seem to be an important element in enhancing credibility. Second, credit market



frictions do not seem to be consequential in the euro area. And third, there still exist heterogeneous distributive effects of a monetary policy shock. Whether these effects are of relevance to the optimal monetary policy in a monetary union is highly uncertain. Even though financial markets already seem to be efficient in the transmission of monetary policy to the real economy, further removing existing frictions, as maintained by the complete implementation of the Financial Services Action Plan, is warranted. The discussant, *Beatrice Weder*, Johannes Gutenberg University of Mainz, mentioned that the inconsistency of the results found in micro studies and Alves' findings at the macroeconomic level, an inconsistency also identified in other areas of economic research, calls for further research.

*E. Philip Davis*, Brunel University, provided an overview of potential implications of aging and ongoing pension reforms for financial and monetary stability. Davis reviewed the main transmission channels linking aging to growth through saving, investment, the current account and labor productivity, which was followed by a discussion of the main risks of pension reforms or reliance on unsustainable pay-as-you-go pension systems to monetary and financial stability. Regarding the latter, numerous potential risks may lead to banking crises, bubble bursts and financial crises; the probability of such risks materializing, however, declines with the degree of efficiency of financial markets in general. Monetary stability is affected to the extent that aging raises the real

interest rate, decreases inflation due to increased precautionary savings as a potential consequence of pension reforms, increases inflation due to dissaving of retiring baby boomers or as a consequence of a declining workforce. Hence, at different points of the aging process deflationary and inflationary pressures may arise, but as stressed by Davis these mechanisms will evolve gradually and thus give central banks time to adapt. The controversial issue whether monetary policy should respond to the financial stability objective was also raised; Davis suggested a monetary response to misaligned asset prices. *Klaus Schmidt-Hebbel*, Banco Central de Chile, mentioned the skeptical view held by many central bankers about pursuing a financial stability target. As an alternative they would propose a monetary reaction to the extent that asset prices affect output gap and inflation projections, and to extend the policy horizon to take account of potential asset market and lending booms. In discussing the macroeconomic impact of pension reforms, Schmidt-Hebbel referred to the experience of the reform in Chile launched in 1981 that represented a radical shift to a privately managed fully-funded pension system. On average, the overall growth effect of this reform is estimated to have boosted growth by 0.5% per year.

The Austrian Minister for Finance, *Karl-Heinz Grasser*, discussed topical policy issues related to the Stability and Growth Pact and emphasized that sound public finances are necessary to create appropriate conditions for sustained growth.

**Session 3:  
Challenges on the Way**

*Andrew Hughes Hallet*, Vanderbilt University, presented the paper “The European Economy at the Crossroads: Structural Reforms, Fiscal Constraints, and the Lisbon Agenda” jointly written with Svend E. Hougaard Jensen (CEBR and SDU) and Christian Richter (Loughborough University). The authors studied the incentives to enlarge a monetary union under alternative assumptions about the extent of market reforms within the union and accession countries. This might explain why some countries, while not qualified, would be willing to join EMU, whereas other countries – albeit qualified – might be unwilling to join. Lack of labor mobility and/or wage/price flexibility or fiscal reforms entails costs for both new entrants and for the existing union. Countries will therefore be willing to join a union when there has been sufficient reform, and when markets are more flexible than their own. On the other hand, existing members will call for the same properties in their partners. Fiscal restrictions may exaggerate the incentive mismatch and delay necessary reforms. Overall, if the expected benefits (e.g. a decrease in unemployment) are lower than the costs of joining EMU (exposure to asymmetric shocks and asymmetric rigidities), a country will be less willing to join EMU.

In his discussion, *Georg Busch*, European Commission, contrasted this paper with Bayoumi’s findings (1994, A formal model of optimum currency areas). Bayoumi argues that the incentives for a small “out” to join a monetary union will always be higher than the incentives for the union to accept a new member. An analysis should take into account the relative power

position of a small “out” versus a large “in.” Busch also questioned the assumption of automatic free riding of the rigid on the flexible economy. Besides, joining EMU entails the loss of the exchange rate as an instrument to adjust to shocks. Eventually, to date it has not been observed that EMU is moving towards inflexibility.

*Dalia Marin*, University of Munich, addressed the fear of many citizens that Eastern enlargement would lead to substantial job losses, in particular losses of high-skilled and IT jobs. According to the results of her investigation such fears are not justified, at least for Austria and Germany. Eastern enlargement has led to surprisingly few job losses because jobs in Eastern Europe do not compete with jobs in Austria and Germany. In contrast, low-cost jobs of Eastern European affiliates have been helping Austrian and German firms to stay globally competitive. The most skill-intensive activities have, however, been outsourced to Eastern Europe to address the human capital scarcity in Austria and Germany that became particularly severe in the 1990s. At that time, high-skilled job transfers to Eastern Europe accounted for 10% of Germany’s and 48% of Austria’s supply of university graduates. It follows that R&D subsidies do not suffice to address the skill exodus to Eastern Europe. Rather, investing in education and training and liberalizing high-skill labor movement will be more effective.

In his discussion, *Christian Helmenstein*, Institute for Advanced Studies, Vienna, emphasized that following a new international division of labor, the export concentration of Eastern European countries has increased during the past years, while it has remained the same for Austria and Ger-

many. Decreased diversification does not automatically lead to a higher exposure to asymmetric shocks as vertical FDI plays a major role in intra-industrial trade patterns. Finally, the intensity of labor migration is also crucial for the economic future of all countries. If migration is not too high in the near future, then Austria and Germany might again become a high-income/high-skilled economy. If migration happens to be too intensive, then a transition to a low-income/low-skilled economy is likely. Hence, R&D subsidies might be inefficient. Education and attraction of skill-intensive industries are presumed to be more effective.

*Otmar Issing*, European Central Bank, highlighted important linkages between structural reforms and the conduct of monetary policy and vice versa. At the outset, he, however, emphasized that the European countries must proceed with structural reforms, in particular in the areas of labor markets, research and development, innovation, education and the Single Market to achieve a higher long-run growth path with higher real income. To this end, the instrument of numerical targets as a benchmark for the progress with structural reforms should be strengthened to increase the necessary pressure on underperforming countries. He then focused on the interplay between structural reforms and monetary policy. Structural reforms that create a more flexible environment tend to facilitate monetary policy and increase its effectiveness. For example, more flexible labor markets would absorb negative supply shocks with a smaller short-term increase in inflationary pressures. This would allow monetary policy to react less strongly, and price stability would in turn be easier to

maintain. Moreover, such a flexible economic environment would also help keep the volatility of inflation and output in check. On the other hand, the stability-oriented single monetary policy and the systematic monitoring of the stability of the financial system, an activity where the national central banks play a major role, positively contribute to a stable macroeconomic environment, in which structural reforms are easier to implement.

*Anne Brunila*, Finnish Ministry of Finance, elaborated on the issue of structural reforms and fiscal sustainability. She first identified two major challenges common to all EU Member States, namely population aging as well as increasing international competition and globalization. Both factors aggravate the financing of the welfare state. Population aging creates strong pressures for increasing public expenditures for pensions and health care, while potential savings in education and unemployment expenditures are likely to be relatively small. Moreover, aging also tends to lower labor supply and productivity, which in turn reduces potential GDP growth. At the same time, international (tax) competition makes it difficult to increase tax revenues. In the light of these challenges, reforms would be needed to enhance the growth potential and to secure the long-term sustainability of public finances. Brunila moreover pointed out that the broad range of reform areas includes trade, financial markets, product markets, labor markets, tax and benefit systems and the public sector. Given the uncertain distribution of the costs and benefits of reforms across the economy and over time, the impact of structural reforms is often difficult to quantify, however. Broad-based pension reforms are nec-

essary but still not sufficient. It would be vital to implement complementary structural reforms to raise both potential growth and employment.

*Heinz Handler*, Austrian Institute of Economic Research, remarked that structural reforms should address all aspects of public sector involvement, in particular the legal setting, the efficiency of the government and the impact of government-sector on private-sector productivity.

### **Summary**

*Josef Christl*, OeNB, summarized the core issues that had emerged during the conference. He remarked that the Lisbon agenda is highly ambitious and that the implementation is lagging behind. The effort to reach the goals set out in Lisbon should there-

fore be stepped up. There appears to be a broad consensus that structural reforms are absolutely necessary; nevertheless, priorities must be set in the first place. Reforms geared towards making labor markets more flexible are all-important. Competition policy also plays an important role. Moreover, the quality of public finances should be enhanced. Numerical targets provide a useful device for benchmarking the results achieved through structural reforms. A sound financial system and stable prices are necessary preconditions and help implement structural reforms. Last, but not least, the communication policy needs to be improved. After all, it is essential that there is broad public agreement about necessary structural reforms.

# NOTES

# 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 Economics 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	OECD	Organisation for Economic Co-operation and Development
EMS	European Monetary System	OeKB	Oesterreichische Kontrollbank (Austria's main financial and information service provider for the export industry and the capital market)
EMU	Economic and Monetary Union	OeNB	Oesterreichische Nationalbank (Austria's central bank)
EONIA	Euro OverNight Index Average	OPEC	Organization of the Petroleum Exporting Countries
ERM II	Exchange Rate Mechanism II (EU)	ORF	Österreichischer Rundfunk – Austrian Broadcasting Corporation
ERP	European Recovery Program	ÖBFA	Austrian Federal Financing Agency
ESA	European System of Accounts	ÖNACE	Austrian Statistical Classification of Economic Activities
ESAF	Enhanced Structural Adjustment Facility (IMF)	PE-ACH	pan-European automated clearing house
ESCB	European System of Central Banks	PISA	Programme for International Student Assessment (OECD)
ESRI	Economic and Social Research Institute	POS	point of sale
EU	European Union	PRGF	Poverty Reduction and Growth Facility (IMF)
EURIBOR	Euro Interbank Offered Rate	RTGS	Real-Time Gross Settlement
Eurostat	Statistical Office of the European Communities	SDR	Special Drawing Right (IMF)
FATF	Financial Action Task Force on Money Laundering	SDRM	Sovereign Debt Restructuring Mechanism (IMF)
Fed	Federal Reserve System	SEPA	Single Euro Payments Area
FFF	Forschungsförderungsfonds für die Gewerbliche Wirtschaft – Austrian Industrial Research Promotion Fund		
FMA	Financial Market Authority (for Austria)		
FOMC	Federal Open Market Committee (U.S.A.)		
FSAP	Financial Sector Assessment Program (IMF)		
FWF	Fonds zur Förderung der wirtschaftlichen Forschung – Austrian Science Fund		
GAB	General Arrangements to Borrow		
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
STP	straight-through processing	WBI	Wiener Börse Index
STUZZA	Studiengesellschaft für Zusammenarbeit im Zahlungsverkehr G.m.b.H. – Austrian Research Association for Payment Cooperation	WEF	World Economic Forum
S.W.I.F.T.	Society for Worldwide Interbank Financial Telecommunication	WIFO	Österreichisches Institut für Wirtschaftsforschung – Austrian Institute of Economic Research
TARGET	Trans-European Automated Real-time Gross settlement Express Transfer	WIIW	Wiener Institut für internationale Wirtschaftsvergleiche – The Vienna Institute for International Economic Studies
Treaty	refers to the Treaty establishing the European Community	WKO	Wirtschaftskammer Österreich – Austrian Federal Economic Chamber
UNCTAD	United Nations Conference on Trade and Development	WTO	World Trade Organization

## 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
- Ø = 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 the Monetary Policy & the Economy<sup>1</sup>

[http://www2.oenb.at/english/engl\\_p.htm](http://www2.oenb.at/english/engl_p.htm)

### 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*

### Issue Q2/04

Global Recovery and Stable Domestic Economic Conditions Support Moderate Upswing – Economic Outlook for Austria from 2004 to 2006 (Spring 2004)

*Gerhard Fenz, Johann Scharler, Martin Schneider*

The Impact of Oil Price Changes on Growth and Inflation

*Martin Schneider*

Sectoral Specialization in Austria and in the EU-15

*Jürgen Janger, Karin Wagner*

The Role of Revaluation and Adjustment Factors in Pay-As-You-Go Pension Systems

*Markus Knell*

Financial Market Structure and Economic Growth: A Cross-Country Perspective

*Friedrich Fritzer*

The Role of Bank Lending in Market-Based and Bank-Based Financial Systems

*Sylvia Kaufmann, Maria Teresa Valderrama*

Growth and Stability in the EU: Perspectives from the Lisbon Agenda – Results from the 32<sup>nd</sup> Economics Conference

*Sylvia Kaufmann, Burkhart Raunig, Helene Schubert*

<sup>1</sup> *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](http://www.oenb.at)). As from September 2004, the monthly statistical bulletin will be replaced by the quarterly publication *Statistiken – Daten & Analysen*.

[http://www2.oenb.at/stat-monatsheft/englisch/start\\_p.htm](http://www2.oenb.at/stat-monatsheft/englisch/start_p.htm)

## Statistiken – Daten & 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 from September 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, research findings and information on macroeconomic workshops and conferences organized by the OeNB.

[http://www2.oenb.at/english/engl\\_p.htm](http://www2.oenb.at/english/engl_p.htm)

## 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 to 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.

[http://www2.oenb.at/english/engl\\_p.htm](http://www2.oenb.at/english/engl_p.htm)

## Focus on Transition

semiannual

The *Focus on Transition* contains CEEC-related economic analyses and recent data as well as descriptions of CEEC-related events hosted by the OeNB.

[http://www2.oenb.at/english/engl\\_p.htm](http://www2.oenb.at/english/engl_p.htm)

## 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.

[http://www2.oenb.at/english/engl\\_p.htm](http://www2.oenb.at/english/engl_p.htm)

**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.

[http://www2.oenb.at/rel/e\\_p2tagu.htm](http://www2.oenb.at/rel/e_p2tagu.htm)

**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.

[http://www2.oenb.at/rel/e\\_p2tagu.htm](http://www2.oenb.at/rel/e_p2tagu.htm)

**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).

[http://www2.oenb.at/english/engl\\_p.htm](http://www2.oenb.at/english/engl_p.htm)

**Workshops – Proceedings of OeNB Workshops      recurrent**

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

[http://www2.oenb.at/english/engl\\_p.htm](http://www2.oenb.at/english/engl_p.htm)

**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.

[http://www2.oenb.at/english/engl\\_p.htm](http://www2.oenb.at/english/engl_p.htm)

**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).

*<http://www2.oenb.at/content/Newsletter--1150/index.xml.frame>*

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