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Contents

ANALYSES

Austria's Economy Will Continue to Grow Dynamically in 2007 Economic Outlook for Austria from 2006 to 2008 (December 2006) <i>Gerhard Fenz, Martin Schneider</i>	6
Limited Pass-Through from Policy to Retail Interest Rates: Empirical Evidence and Macroeconomic Implications <i>Claudia Kwapil, Johann Scharler</i>	26
Globalization, Inflation and Monetary Policy <i>Ernest Gnan, Maria Teresa Valderrama</i>	37
The New Keynesian Philipps Curve for Austria – An Extension for the Open Economy <i>Fabio Rumler</i>	55
Revised and New Competitiveness Indicators for Austria Reflect Improvement Trend since EMU Accession <i>Walpurga Köhler-Töglhofer, Christa Magerl, Peter Mooslechner</i>	70
Reforming the International Monetary Fund – Some Reflections <i>Herbert Gratz, Harald Grech</i>	98

NOTES

Abbreviations	120
Legend	121
List of Studies Published in Monetary Policy & the Economy	122
Periodical Publications of the Oesterreichische Nationalbank	125
Addresses of the Oesterreichische Nationalbank	128

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

ANALYSES

Austria's Economy Will Continue to Grow Dynamically in 2007

Economic Outlook for Austria from 2006 to 2008

(December 2006)

Gerhard Fenz,
Martin Schneider

1 Summary

According to the economic outlook of the Oesterreichische Nationalbank (OeNB), Austria's real gross domestic product (GDP) is expected to grow by 3.3% in 2006 and by 2.8% and 2.4% in 2007 and 2008, respectively. The OeNB's growth forecasts for 2006 and 2007 have been revised upward by 0.8 and 0.6 percentage point, respectively, since the June 2006 outlook. Inflation will drop to 1.7% in 2006 and will fall further to 1.4% in 2007. A slight increase to 1.6% is forecast for 2008. Employment will continue to increase substantially, significantly reducing the unemployment rate from 5.2% in 2005 to 4.7% in 2008.

In 2006, the global economy developed very dynamically, mainly fueled by the decrease in oil prices after their peak in August, by low long-term interest rates and the continued strong growth in China. This devel-

opment was only dampened by the slowdown in U.S. real estate markets and the related overall economic downturn in the United States. Domestic euro area demand has strengthened, which supports the overall euro area economy. In particular the expansion of the German economy no longer relies on exports only, but has also been driven by investment. The German consolidation package, which will become effective at the beginning of 2007, is not expected to have more than a slight dampening effect on the Austrian economy.

The continued positive development of global trade favors vigorous export growth, which is expected to come to 7.6% in 2006 and to cool down only slightly to 6.5% in 2007 and 6.6% in 2008. Investment growth picked up markedly in 2006, starting out from a very low investment ratio in 2005. Strong export activity led to a full utilization of available capacities

Chart 1

Real GDP Growth (Seasonally Adjusted)



Source: Eurostat, OeNB.

JEL classification: C5, E17.

Keywords: Forecast,
Austria.

Table 1

OeNB December 2006 Outlook for Austria - Key Results¹

	2005	2006	2007	2008
Annual change in % (real)				
Economic activity				
Gross domestic product	+2.6	+3.3	+2.8	+2.4
Private consumption	+1.5	+1.8	+2.2	+2.1
Government consumption	+1.9	+1.1	+1.4	+1.9
Gross fixed capital formation	+1.4	+4.5	+4.0	+2.8
Exports of goods and services	+6.9	+7.6	+6.5	+6.6
Imports of goods and services	+6.1	+6.0	+6.4	+6.8
Percentage points of GDP				
Contribution to real GDP growth				
Private consumption	+0.9	+1.0	+1.2	+1.2
Government consumption	+0.3	+0.2	+0.2	+0.3
Gross fixed capital formation	+0.3	+1.0	+0.8	+0.6
Domestic demand (excluding changes in inventories)	+1.5	+2.2	+2.3	+2.1
Net exports	+0.7	+1.2	+0.4	+0.3
Changes in inventories (including statistical discrepancy)	+0.4	-0.1	+0.1	+0.0
Annual change in %				
Prices				
Harmonised Index of Consumer Prices (HICP)	+2.1	+1.7	+1.4	+1.6
Private consumption expenditure (PCE) deflator	+1.6	+1.7	+1.4	+1.6
GDP deflator	+1.5	+1.3	+1.4	+1.6
Unit labor costs in the total economy	-0.5	+0.1	+0.7	+0.8
Compensation per employee (at current prices)	+2.0	+2.6	+2.5	+2.4
Productivity (whole economy)	+2.5	+2.5	+1.8	+1.5
Compensation per employee (real)	+0.3	+0.9	+1.1	+0.8
Import prices	+3.3	+3.0	+1.5	+1.5
Export prices	+2.7	+2.3	+1.6	+1.5
Terms of trade	-0.6	-0.7	+0.1	-0.1
Income and savings				
Real disposable household income	+1.8	+2.7	+2.3	+1.8
% of nominal disposable household income				
Saving ratio	9.0	9.4	9.5	9.1
Annual change in %				
Labor market				
Payroll employment	+0.6	+1.5	+1.6	+1.3
%				
Unemployment rate (Eurostat definition)	5.2	4.9	4.7	4.7
% of nominal GDP				
Budget				
Budget balance (Maastricht definition)	-1.5	-1.3	-1.0 to -1.6	-0.9 to -1.4

Source: 2005: Eurostat, Statistics Austria; 2006 to 2008: OeNB December 2006 outlook.

¹ The outlook was drawn up on the basis of seasonally and working-day adjusted national accounts data. Therefore, the historical values for 2005 deviate from the nonadjusted data released by Statistics Austria.

in export-oriented sectors, giving rise to the need for additions to capital. Investment was also supported by the robust earnings situation and favorable financing conditions.

The situation for Austrian consumers markedly improved in 2006, as rising real wages and strong employment growth led to a significant increase in real disposable household

income. Consumer confidence also grew noticeably in the course of 2006. However, as the effect of income rises on consumption growth is usually lagged, consumption growth for 2006 is expected to only accelerate slightly to 1.8%, while the saving ratio is predicted to increase by 0.4 percentage point. Consumption growth is forecast to climb to 2.2% in 2007 and to level off at 2.1% in 2008.

The robust economic situation has had a clearly stimulating effect on the labor market: Payroll employment is expected to grow by 1.5% in 2006 and by 1.6% and 1.3% in 2007 and 2008, respectively. This will cause the unemployment rate to drop from 5.2% (2005) to 4.9% (2006) and then to 4.7% (2007 and 2008).

On the back of the recent decrease in oil prices, inflation as measured by the Harmonized Index of Consumer Prices (HICP) fell by 0.4 percentage point in 2006 coming to 1.7%. Based on an assumed moderate wage development, low inflation rates are expected for 2007 (1.4%) and 2008 (1.6%).

2 Technical Assumptions

The Oesterreichische Nationalbank (OeNB) compiled this forecast as its input for the Eurosystem's December 2006 staff projections for macroeconomic trends in the euro area. The forecast horizon extends from the fourth quarter of 2006 to the fourth quarter of 2008. November 14, 2006, was the cutoff date for data feeding into the underlying assumptions on global economic trends and into the technical assumptions on interest rates, exchange rates and crude oil

prices. The OeNB used its macroeconomic quarterly model¹ to prepare the projections.

The seasonally and working-day adjusted national accounts data calculated by the Austrian Institute of Economic Research (WIFO), which are fully available up to the second quarter of 2006, represent the main data source. GDP flash estimates are available for the third quarter, but only for some of the series.

The short-term interest rate assumed for the forecasting horizon is based on market expectations for the three-month EURIBOR. Thus, for 2006, 2007 and 2008, it is 3.1%, 4.0% and 3.8%, respectively. The long-term interest rates are aligned with market expectations for ten-year government bonds and are forecast to come to 3.8% (2006), 3.7% (2007) and 3.7% (2008). A constant rate of 1.28 is assumed for future USD/EUR exchange rate developments. Taking into account the values realized thus far, the average rate for 2006 is 1.25 USD/EUR. The assumed oil price developments are based on the forward rates, which are expected to be USD 65.5, USD 64.6 and USD 67.2 per barrel (Brent) for 2006, 2007 and 2008, respectively. Vis-à-vis the June outlook, this represents a downward revision of USD 7.9 on average over the entire forecasting horizon.

3 International Environment Remains Dynamic

3.1 Asia Driving Force of Global Growth

Global economic developments from 2006 to 2008 will be characterized by a moderate slowdown and a regional shift of the main growth impe-

¹ The most recent version of the model is discussed in: Schneider, M. and M. Leibrecht. 2006. AQM-06: The Macroeconomic Model of the OeNB. OeNB Working Paper No. 132.

tus from the U.S.A. to Asia. Global trade growth will only decline slightly after the exceptional performance in 2006. The slowdown of the U.S. economy and the connected low interest level for U.S. government bonds are, inter alia, reflected in the generally low level of worldwide long-term interest rates.

The growth of the *U.S. economy*, which had been vigorous in recent years, reached a peak in the first quarter of 2006 and has declined slightly since then. The driving force of this development was the real estate boom, which strengthened private consumption and residential construction investment. As real estate price growth leveled off and energy prices rose, consumption also cooled off. Real estate prices in the U.S. seem to be headed for a “soft landing” without any abrupt corrections.² The favorable labor market situation and currently falling energy prices have provided positive stimuli for private consumption. The current monetary policy situation in the U.S. is characterized by a flat, from time to time even inverted, yield curve, which is often interpreted as a sign for an impending slowdown of the U.S. economy. Currently, however, the low level of long-term interest rates seems to be attributable to the very high demand for U.S. government bonds. Though the macroeconomic imbalances in the U.S.A. (large budget and current account deficits) need to be addressed in the medium term, they do not pose an immediate cyclical risk. For 2007 and 2008, a switch to a more moderate growth path is to be expected.

The countries of Asia will continue to develop dynamically. The *Japanese economy* is expanding strongly, driven by robust domestic demand and dynamic exports. For the first time in years, consumer prices are expected to slightly rise again in 2006. In July 2006, the Japanese central bank raised interest rates to 0.25%, thus ending its zero interest rate policy after five years. Japan’s precarious fiscal situation is a risk factor. Owing to a continuously expansive fiscal policy, public debt amounts to roughly 175% of GDP, meaning that a more restrictive fiscal policy is inevitable. Thus, a deceleration of growth can be expected for 2007 and 2008.

China remains the engine of economic growth in the region. Next to exports and investments, consumption is also rising strongly. To prevent overheating, Chinese economic policymakers have raised interest rates and implemented other restrictive measures.

The economic situation in the *United Kingdom* stabilized in 2006 thanks to lively investment demand and an increase in private consumption. The labor market is characterized by strongly growing labor supply as a consequence of immigration and higher participation rates among older persons. The U.K. economy is expected to continue its steady growth path at more than 2.5%.

In *Switzerland*, growth was vigorous and broadly based in 2006, but is expected to decline from 2007 on. The new *EU Member States’* economies will record expansion rates above the euro area average over

² For a discussion of the implications an abrupt correction of U.S. real estate prices would have for Austria, see chapter 8.

Table 2

Underlying Global Economic Conditions				
	2005	2006	2007	2008
Annual change in % (real)				
Gross domestic product				
World GDP growth outside the euro area	+5.2	+5.3	+4.8	+4.8
U.S.A.	+3.2	+3.3	+2.4	+2.8
Japan	+2.6	+2.7	+1.9	+1.8
Asia excluding Japan	+8.1	+8.3	+7.7	+7.6
Latin America	+4.2	+4.4	+3.6	+3.5
United Kingdom	+1.9	+2.6	+2.8	+2.5
New EU Member States	+4.6	+5.2	+4.6	+4.5
Switzerland	+1.9	+2.9	+1.8	+1.7
Euro area ¹	+1.5	+2.5 to +2.9	+1.7 to +2.7	+1.8 to +2.8
World trade (imports of goods and services)				
World economy	+7.3	+8.3	+6.3	+6.4
Non-euro area countries	+8.4	+8.8	+6.9	+6.9
Real growth of euro area export markets	+8.3	+10.2	+7.1	+6.7
Real growth of Austrian export markets	+6.6	+9.6	+6.2	+6.4
Prices				
Oil price in USD/barrel (Brent)	54.4	65.5	64.6	67.2
Three-month interest rate in %	2.2	3.1	4.0	3.8
Long-term interest rate in %	3.4	3.8	3.7	3.7
USD/EUR exchange rate	1.24	1.25	1.28	1.28
Nominal effective exchange rate (euro area index)	103.90	104.50	105.56	105.56

Source: Eurosystem.

¹ Results of the Eurosystem's December 2006 projections. The ECB presents the result in ranges based upon average differences between actual outcomes and previous projections.

the entire forecasting horizon, thus strongly supporting Austrian exports.

3.2 Euro Area Economy Driven by Investments

The euro area economy strengthened in the course of 2006, mainly supported by the favorable development of investment activity. During the coming two years, domestic demand will continue to be the motor of economic growth. The real estate price surges recently observed in many euro area countries have caused wealth effects which in turn have supported consumption. At present, economic survey results are mixed. While confidence indicators continue their steep climb, leading indicators show that growth rates are expected to decline in early 2007. After 2.5%

to 2.9% in 2006, a decrease to 1.7% to 2.7% is expected for 2007.

Unlike the developments in recent years, the growth of the *German economy* in 2006 was not exclusively driven by exports but also investments. The outlook for consumption is dominated by the increase in value-added tax from 16% to 19% scheduled for the beginning of 2007. As a related burst of buying can be expected in the consumer durables sector toward the end of 2006, purchases are going to drop in early 2007, thus weakening consumption. Residential construction expenditure, which was strong in 2006, will not only be affected by the VAT increase but also by a series of discretionary measures (abolition of the tax grant for new building permits ("Eigenheimzulage") in early 2006 and of subsi-

dies for energy-saving measures); thus, it is predicted to cool off in 2007. Despite the dampening effect of these consolidation measures, the German economy remains on a solid expansion path and is expected to pick up again in 2008.

Economic growth in *France* was driven by robust domestic demand in 2006. Strong real wage increases favored private consumption, which will be further supported by a tax reform which will enter into force at the beginning of 2007. Net exports, however, provided no growth stimulus owing to declining export growth rates and strong domestic demand. The fall in exports led to a stagnation of economic growth in the third quarter of 2006.

After having stagnated in 2005, *Italy's economy* returned to growth rates close to potential output growth in the first half of 2006. In the third quarter, however, economic activity slackened again. Consumer spending and thus overall economic activity are going to be weakened by necessary consolidation measures in 2007 and 2008.

4 Exports Remain Pillar of Austria's Economic Activity

Austrian exports have benefited from robust global growth and in particular from the economic recovery of the euro area. Austrian export markets (defined as the weighted imports of Austria's trading partners) have been expanding strongly since early 2004, with the sole exception of the first quarter of 2005, when there was a contraction. This expansion course reached its peak in the first quarter of 2006, before slowing down a bit in the second quarter. Austrian export markets are expected to grow by

9.6% in the entire year 2006. This even surpasses growth in 2004, when exports could be increased by 9.5%.

The expected burst of buying in the run-up to the German VAT increase will only slightly dampen the growth of Austrian export markets and thus of exports in the first quarter of 2007. The effects on Austrian GDP growth in 2007 are estimated to come to -0.1 percentage point; negligible effects are expected for 2006.

The price competitiveness of Austrian exports, which deteriorated from 2002 to 2004 – mainly owing to exchange rate developments –, is likely to stay more or less unchanged over the forecasting horizon, provided the nominal USD/EUR exchange rate remains constant. The rise in unit labor costs predicted for 2006 to 2008 will not feed through into export prices, as international competition is simply too strong.

The dynamic export activity and the strong growth of the domestic economy will lead to strong import demand over the entire forecasting horizon. Although the contribution of net exports to growth is going to decline due to the predicted slight deceleration of export growth in 2007, it will remain positive in all three years of the forecasting horizon.

As the compilation method for the current account statistics has been modified, there is a break in the time series in the first quarter of 2006. Thus, there is no current account forecast in this issue. Backcast series will be available from summer 2007. The balance on goods and services according to the national accounts will improve over the entire forecasting horizon, the greatest improvement being expected for 2006.

Table 3

Growth and Price Developments in Austria's External Trade

	2005	2006	2007	2008
Annual change in %				
Exports				
Competitor prices in Austria's export markets	+2.3	+2.1	+1.2	+1.3
Export deflator	+2.7	+2.3	+1.6	+1.5
Changes in price competitiveness	-0.4	-0.2	-0.4	-0.1
Import demand in Austria's export markets (real)	+6.6	+9.6	+6.2	+6.4
Austrian exports of goods and services (real)	+6.9	+7.6	+6.5	+6.6
Market share	+0.3	-2.0	+0.3	+0.2
Imports				
International competitor prices in the Austrian market	+2.0	+1.9	+1.2	+1.2
Import deflator	+3.3	+3.0	+1.5	+1.5
Austrian imports of goods and services (real)	+6.1	+6.0	+6.4	+6.8
Terms of Trade	-0.6	-0.7	+0.1	-0.1
Percentage points of real GDP				
Contribution of net exports to GDP growth	+0.7	+1.2	+0.4	+0.3

Source: 2005: Eurostat; 2006 to 2008: OeNB December 2006 outlook, Eurosystem.

5 Real Wages Pick up Slightly

The HICP inflation rate fell to 1.2% in October 2006, but is expected to temporarily rise again over the coming months. Inflation will reach its peak in the first quarter of 2007 (1.8%) and start to drop noticeably again from the second quarter, when oil price effects will have finally faded away, and remain at a low level until end-2007. The short-term rise in inflation over the coming months can be attributed to expected energy and service price developments. In the energy sector, the base effect of strongly increased fuel prices in the same period of 2005, which led to a sharp decline in inflation between August (2.1%) and October 2006 (1.2%), will fade away again, causing inflation to rise again. In 2006, the spread between petrol and crude oil prices narrowed exceptionally. According to this forecast, the spread will return to its average value, slightly driving up inflation.

In the service sector, considerable price hikes are expected in the travel segment (air travel and package holidays) over the coming months; in the first ten months of 2006, these positions had posted surprisingly negative price dynamics despite the energy price spike. For the entire year 2006, the OeNB expects an HICP inflation rate of 1.7%; for 2007, it predicts a further decline to 1.4%. The output gap will turn positive toward the end of the forecasting horizon, and inflation will slightly pick up in 2008 (1.6%) owing to the ensuing demand-side price pressure.

Wage negotiations for 2007 have only been concluded for a few sectors. At the time the OeNB outlook was prepared, only the results for the metal sector – which usually have a signaling function for the entire fall wage negotiations – and the public sector were available. These results seem to indicate that the nominal growth of standard wages will be

Table 4

Price and Cost Indicators for Austria

	2005	2006	2007	2008
Annual change in %				
Harmonised Index of Consumer Prices (HICP)	+2.1	+1.7	+1.4	+1.6
HICP energy	+9.8	+6.3	+1.2	+0.8
HICP excluding energy	+1.5	+1.3	+1.5	+1.6
Private consumption expenditure (PCE) deflator	+1.6	+1.7	+1.4	+1.6
Investment deflator	+1.9	+1.6	+1.3	+1.5
Import deflator	+3.3	+3.0	+1.5	+1.5
Export deflator	+2.7	+2.3	+1.6	+1.5
Terms of Trade	-0.6	-0.7	+0.1	-0.1
GDP at factor cost deflator	+1.2	+1.4	+1.5	+1.6
Unit labor costs	-0.5	+0.1	+0.7	+0.8
Compensation per employee	+2.0	+2.6	+2.5	+2.4
Labor productivity	+2.5	+2.5	+1.8	+1.6
Collectively agreed wage settlements	+2.3	+2.7	+2.4	+2.3
Profit margins ¹	+1.7	+1.2	+0.8	+0.8

Source: 2005: Eurostat, Statistics Austria; 2006 to 2008: OeNB December 2006 outlook.

¹ GDP deflator divided by unit labor costs.

somewhat lower in 2007 (+2.4%) than in 2006 (+2.7%). Due to the distribution option³ negotiated for the metal sector and the one-off payment of EUR 100, however, the growth of compensation per employee in 2007 (+2.5%) will remain only slightly below the 2006 value (+2.6%).

Owing to low inflation rates, total payroll growth will decelerate further in 2008 by 0.1 percentage point. Low inflation is also leading to an acceleration of real employee compensation growth – which had been below average in the past six years – to roughly 1% per year. Real wage growth continues to lag behind productivity growth, but not as considerably as in recent years. Higher real wage increases and declining productivity rises induced by vigorous employment growth will again lead to a stronger rise in unit labor cost in 2007 and 2008. The wage share of GDP will fall by 0.7 percentage point

to 48.3% over the forecasting horizon.⁴

6 Domestic Demand Characterized by Lively Investment Activity and Moderately Rising Propensity to Consume

6.1 Strong Increase in Household Income Likely to Favor an Acceleration of Consumption Growth and a Rise in the Saving Ratio

Against the background of strong oil price hikes, fear of job losses and necessary adjustments in the Austrian pension system, consumer confidence has been below average in recent years. As a consequence, households' propensity to consume has been noticeably subdued. The saving ratio increased from 7.5% in 2001 to 9.0% in 2005.

In the course of 2006, consumer confidence increased markedly on the

³ If a company decides on a distribution option, its total wage bill must be raised by 2.9%.

⁴ The wage share represents employee compensation as a percentage of nominal GDP.

Table 5

Determinants of Nominal Household Income in Austria				
	2005	2006	2007	2008
Annual change in %				
Compensation of employees	+2.6	+4.1	+4.1	+3.7
Employees	+0.6	+1.5	+1.6	+1.3
Wages per employee	+2.0	+2.6	+2.5	+2.4
Mixed income (net) of the self-employed and property income	+5.8	+6.6	+5.0	+4.4
Contribution to disposable household income in percentage points				
Compensation of employees	+2.2	+3.4	+3.4	+3.0
Mixed income (net) of the self-employed and property income	+1.8	+2.1	+1.6	+1.4
Net transfers minus direct taxes ¹	-0.5	-1.0	-1.3	-1.1
Disposable household income (nominal)	+3.5	+4.4	+3.7	+3.4

Source: 2005: Eurostat; 2006 to 2008: OeNB December 2006 outlook.

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

back of the improved labor market situation and the temporary end to the oil price climb. Real disposable household income is rising strongly (2006: +2.7%) owing to higher real wages and a robust expansion of employment. Nevertheless, the growth of real consumption in 2006 remains moderate and slightly below expectations, as is reflected by the relatively weak development of confidence in the retail trade sector over the past months. Households' real consumption expenditure will expand by 1.8% in 2006, while the saving ratio will further rise by 0.4 percentage point to 9.4%.

Disposable household income will increase considerably in 2007 and 2008, though not quite as strongly as in 2006. The growth of the income of the self-employed and property income will follow the overall economic cycle, reaching its peak already in 2006. The financial burden arising from tax and net transfer payments is expected to increase slightly in 2007 and 2008. Thanks to the high employment growth, the compensation of employees will further rise

at a pace of 4.1% in 2007 despite somewhat lower wage settlements; compensation growth will decelerate slightly only in 2008 (3.7%). In 2006, 2007 and 2008, overall disposable household income will augment by 4.4%, 3.7% and 3.4%, respectively. Low inflation, which safeguards the purchasing power of nominal income increases, will be a central pillar for consumption over the entire forecasting horizon, and in particular in 2007.

Against this background, higher consumer confidence and the often observed lagged effects of past income increases may be expected to lead to a further acceleration of consumption growth to 2.2% in 2007. This means that the saving ratio will only continue to rise marginally (to 9.5%). Consumption smoothing is responsible for the fact that, despite slightly dampened income growth, private consumption in 2008 should continue to increase at a similarly robust rate (+2.1%) as in 2007. As a consequence, the saving ratio is likely to slightly decline again for the first time since 2001.

Table 6

Private Consumption in Austria

	2005	2006	2007	2008
Annual change in %				
Disposable household income (nominal)	+3.5	+4.4	+3.7	+3.4
Private consumption expenditure (PCE) deflator	+1.6	+1.7	+1.4	+1.6
Disposable household income (real)	+1.8	+2.7	+2.3	+1.8
Private consumption (real)	+1.5	+1.8	+2.2	+2.1
% of nominal disposable household income				
Saving ratio	9.0	9.4	9.5	9.1

Source: 2005: Eurostat; 2006 to 2008: OeNB December 2006 outlook.

6.2 Investment Activity Gains Considerable Momentum

Due to the expiration of the special investment tax credit, corporate investment activity cooled off considerably in 2005. The investment ratio dropped to 21.1%, which was only 0.2 percentage point above the historic low of 2002.

Relative to this low level, the spring 2006 WIFO Investment Survey already indicated a strong acceleration of investment dynamics. The fact that the assessment of capacity utilization was only average at the beginning of 2006 suggests, however, that enterprises initially focused primarily on rationalization measures and replacement investments. Meanwhile, the clearly more favorable assessment of capacity utilization indicates that capacity-building investment projects are likely to rise substantially. For the entire year 2006, real investment is expected to grow by 4.5%; in 2007 and 2008, investment growth is likely to follow the overall economic cycle and fall to 4.0% and 2.8%, respectively. The investment ratio will increase over the forecasting horizon, coming to 21.7% in 2008.

Next to the low starting point, the lively investment activity is attributable to the very favorable corporate earnings situation in recent years

(measured by operating surpluses or profit margins). Growth rates are expected to decline marginally over the forecasting horizon owing to the somewhat more dynamic development of employee compensation. By historical standards, financing conditions will remain favorable over the entire forecasting horizon, thus supporting investment activity. Both short- and long-term real interest rates will remain stable until end-2008 at approximately 2.5%. The yield curve is almost flat and seems to reflect the fact that inflation expectations are anchored at a stable, low level. Finally, the vigorous export activity is also contributing significantly to the positive development of investment dynamics.

After eight years of continuous decline, residential construction investment finally began to slightly increase again in 2005. The solid orders situation and rising real estate prices show that supply has not kept up with the quickly growing demand in recent years. Thus, the OeNB expects that residential construction investment will remain lively over the entire forecasting horizon. Investment in plant and equipment (the investment component that is most affected by the economic cycle) shows the most pronounced investment profile. In 2006, it will grow by 6.6%; for

Table 7

Investment Activity in Austria				
	2005	2006	2007	2008
Annual change in %				
Total gross fixed capital formation (real)	+1.4	+4.5	+4.0	+2.8
of which: Investment in plant and equipment (real)	+2.1	+6.6	+4.6	+2.7
Residential construction investment (real)	+1.1	+4.3	+3.5	+2.1
Nonresidential construction investment and other investment	+1.4	+2.0	+3.0	+3.4
Government investment (real)	+3.5	+3.8	+2.5	+1.6
Private investment (real)	+1.3	+4.5	+4.1	+2.9
Contribution to total gross fixed capital formation growth in percentage points				
Investment in plant and equipment (real)	+0.8	+2.6	+1.9	+1.1
Residential construction investment (real)	+0.2	+0.9	+0.7	+0.4
Nonresidential construction investment and other investment	+0.6	+0.8	+1.2	+1.3
Government investment (real)	+0.2	+0.2	+0.1	+0.1
Private investment (real)	+1.2	+4.3	+3.8	+2.8
Contribution to real GDP growth in percentage points				
Inventory changes (real)	+0.0	-0.0	+0.1	+0.0

Source: 2005: Eurostat; 2006 to 2008: OeNB December 2006 outlook.

2007 and 2008, the OeNB predicts growth rates of 4.6% and 2.7%, respectively.

6.3 Trend Reversal on the Labor Market

The very favorable current economic situation is also reflected in the marked improvement of the labor market situation. In October, employment as registered by the Main Association of the Austrian Social Security Institutions advanced by 1.9% (just above 61,000 persons) year on year, while the number of unemployed people as recorded by the Austrian Public Employment Service fell by almost 23,000. At the beginning of the recovery, most jobs created were part-time; meanwhile, also the number of full-time employees has started rising. This development is also reflected in the employment rise in the manufacturing and construction sectors. In these sectors, which are characterized by a predominance

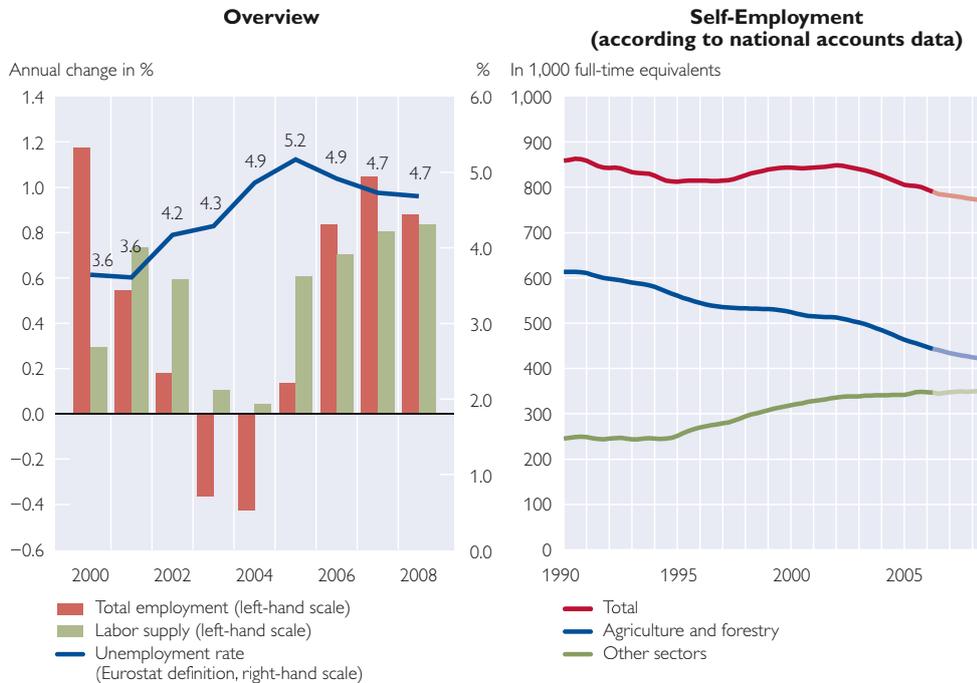
of full-time work, employment had gone down in recent years.

The OeNB expects that payroll employment will continue to increase strongly from 2006 to 2008, by 1.5%, 1.6% and 1.3%, respectively. Total employment growth will be significantly lower (+0.8%, +1.0% and +0.9%), as the number of self-employed persons is declining. Total self-employment according to the national accounts shows a downward trend (see chart 2) due to the fact that about half of the self-employed in the agricultural sector are contributing family workers. In the other sectors (particularly in the business support services sector), the number of self-employed people is growing steadily.

Currently, the growth of labor supply is characterized by the effects of the 2003 pension reform, the increase in foreign labor supply and demographic developments; each year, around 35,000 people enter the labor market. As the robust economic situ-

Chart 2

Labor Market Developments



Source: 2005: Eurostat; 2006 to 2008: OeNB December 2006 outlook.

Table 8

Labor Market Developments in Austria

	2005	2006	2007	2008
Annual change in %				
Total employment	+0.1	+0.8	+1.1	+0.9
of which: Payroll employment	+0.6	+1.5	+1.6	+1.3
Self-employment	-1.9	-1.9	-1.3	-0.8
Public sector employment	+0.4	-0.1	-0.2	-0.7
Registered unemployment	+2.1	-3.8	-1.9	+1.2
Labor supply	+0.6	+0.7	+0.8	+0.8
%				
Unemployment rate (Eurostat definition)	5.2	4.9	4.7	4.7

Source: 2005: Eurostat; 2006 to 2008: OeNB December 2006 outlook.

ation is expected to continue, employment is growing faster than labor supply. As a consequence, the unemployment rate as defined by Eurostat will drop by 0.3 percentage point to 4.9% in 2006. In 2007 and 2008, it is projected to further decrease to 4.7%.

7 Cyclical Risk Currently Not High

The risks to this outlook are assessed to be largely balanced. Oil prices have stabilized after the turbulent developments of the recent past and are currently falling. Although the forward rates assumed in this forecast only change marginally over the forecasting horizon, higher oil prices may

occur due to unpredictable supply constraints. The currently low level of worldwide long-term interest rates could increase. The largest risk factor is the danger of a stronger-than-expected slowdown of the U.S. real estate market. The next section presents a scenario which has been calculated to quantify the related uncertainties. The U.S. budget and current account deficits currently do not pose significant cyclical risks.

Specific domestic risks include small upward risks to investment and consumption. In particular investments, which are very volatile, may rise more strongly than projected in 2007 and 2008. The fact that a new Austrian government was yet to be appointed (and its program presented) at the time this outlook was finalized adds uncertainty to the forecast of budgetary developments in 2007 and 2008.

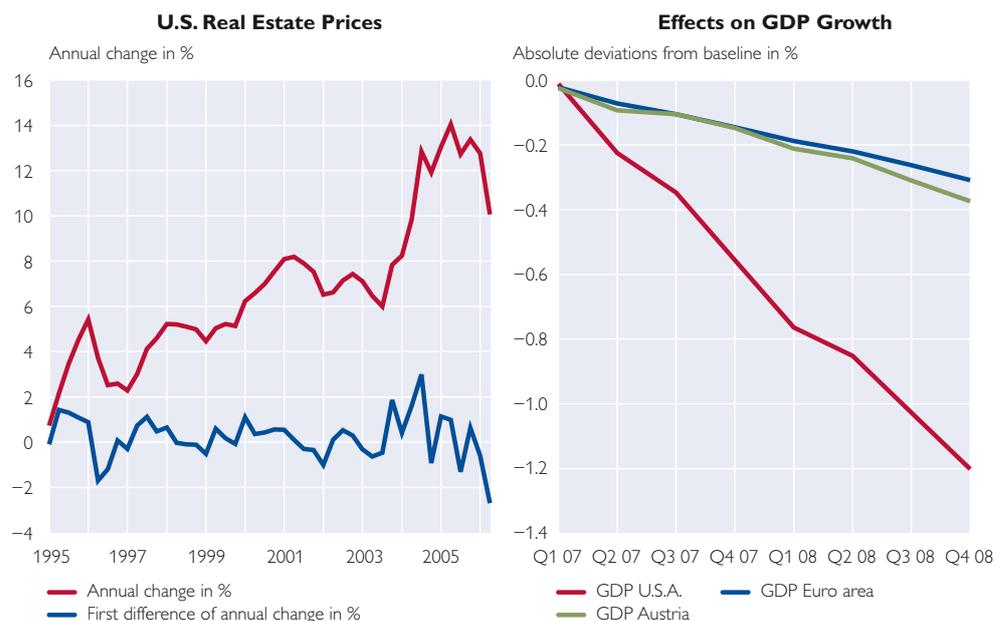
8 Scenario: Stronger Cooling of the U.S. Real Estate Market

In many regions of the United States, real estate price growth had strongly accelerated since end-2003, leading to a significant upturn of the U.S. economy via stepped-up residential construction investments, to an increase in housing assets and a rise in mortgage equity withdrawals, i.e. mortgage loans for consumption purposes. In the second quarter of 2006, however, the year-on-year growth of real estate prices decelerated noticeably by 2.7 percentage points to +10.1%. This development represents the most marked cooling since 1975, when the real estate price index was first compiled; it is widely interpreted as a potential sign for a prospective sharp turn on the real estate markets caused by the Fed's interest rate raises, a decline in speculative activities and excess supply.

Chart 3

Effects of a Stronger-Than-Expected Cooling

of the U.S. Real Estate Market on Austria



Source: Office of Federal Housing Enterprise Oversight (www.ofheo.gov), OeNB.

This outlook is based on the assumption that the U.S. real estate market will only cool down gradually. To simulate the effects of a stronger cooling on the Austrian economy, we assumed a real estate price decrease by 15% by end-2008 in an alternative scenario.

To simulate the effects of a stronger real estate price reduction on the U.S.A. and the euro area, the OeNB resorted to the global econometric model NiGEM.⁵ Based on the results, the effects on Austria were calculated with the OeNB's macroeconomic model. A real estate price shock would lead to an immediate decline in residential construction investment in the United States. Wealth effects would cause a reduction in U.S. consumer demand. In the model, U.S. monetary policy reacts with an interest rate reduction, which would partially offset GDP losses. If we assume constant euro area interest rates and that the interest rate parity holds, the cut of U.S. interest rates would cause the U.S. dollar to depreciate against the euro.

Effects on the euro area and Austria would be transmitted via the trade and exchange rate channels. The demand for Austrian exports would fall by 0.2% (2007) and 0.5% (2008), and Austrian GDP would come to 0.1% (2007) and 0.3% (2008) below the baseline. Thus, the effects on the Austrian economy would be rather limited. Moreover, the probability of such a scenario in the U.S. is currently estimated to be low.

9 Strong Upward Revision vis-à-vis the June 2006 Growth Forecast

The external macroeconomic environment has further improved since the June outlook, most markedly through the strong decrease in oil prices toward end-2006. World trade developed far more favorably in 2006 than had been anticipated in spring. While short-term interest rates for 2006 and 2007 were revised slightly upward, long-term rates for the same period were revised downward.

The effects of the new external assumptions were simulated using the OeNB's macroeconomic model. The new assumptions do not have a significant impact on GDP growth in 2006. On the one hand, this is attributable to the fact that the oil price reductions in the fourth quarter of 2006 will not feed through to the level of economic activity before the first quarter of 2007. On the other hand, the stronger growth of Austrian export markets had already been recorded before the fourth quarter of 2006, i.e. before the forecasting horizon, and thus shows no effect in the simulation. Especially in the first, but also in the third, quarter of 2006, demand for Austrian exports picked up significantly. The new external assumptions increase the growth prospects for 2007 by 0.3 percentage point thanks to the lower oil prices and reduced long-term interest rates, which will also favor growth in 2008.

Table 10 details the reasons for the revisions of the outlook: Apart from the impact of changed external

⁵ The authors would like to thank Markus Arpa and Gabriel Moser for carrying out the NiGEM simulation.

Table 9

Change in the Underlying Global Environment since the June 2006 Outlook

	December 2006			June 2006			Difference		
	2006	2007	2008	2006	2007	2008	2006	2007	2008
	Annual change in %								
Growth of Austria's export markets	+9.6	+6.2	+6.4	+8.0	+5.9	+6.5	+1.6	+0.4	-0.1
Competitor prices in Austria's export markets	+2.1	+1.2	+1.3	+3.1	+1.6	+1.6	-1.0	-0.4	-0.2
Competitor prices in Austria's import markets	+1.9	+1.2	+1.2	+2.9	+1.6	+1.5	-1.0	-0.4	-0.2
	USD								
Oil price per barrel (Brent)	65.5	64.6	67.2	70.3	73.9	71.9	-4.8	-9.3	-4.8
	Annual change in %								
Nominal effective exchange rate (exports)	-0.0	-0.1	+0.0	-0.1	-0.1	+0.0	+0.1	+0.1	+0.0
Nominal effective exchange rate (imports)	-0.1	+0.1	+0.0	-0.1	-0.1	+0.0	-0.1	+0.1	+0.0
	%								
Three-month interest rate	3.1	4.0	3.8	3.1	3.9	4.1	+0.0	+0.1	-0.2
Long-term interest rate	3.8	3.7	3.7	4.0	4.2	4.3	-0.2	-0.5	-0.6
	Annual change in %								
Real GDP, U.S.A.	+3.3	+2.4	+2.8	+3.5	+3.0	+2.9	-0.2	-0.6	-0.1
	USD/EUR								
USD/EUR exchange rate	1.25	1.28	1.28	1.25	1.27	1.27	+0.00	+0.01	+0.01

Source: Eurosystem.

assumptions, they are attributable to the impact of new data and a residual. The effect of new data covers the impact of revisions of historical data (up to the first quarter of 2006), which had already been released for the last forecast, and the forecasting error of the last forecast for the newly released quarterly data (for the second and third quarters of 2006). The item "Other" comprises a new expert assessment regarding the development

of domestic variables such as government consumption, wage agreements and any changes to the forecast models.

The revision of the growth figures for Austria for the year 2006 (+0.8 percentage point) is mainly attributable to the revision of historical data. The growth figure for the first quarter of 2006 alone has been revised upward by some 0.25 percentage point by the Austrian Institute of

Chart 4

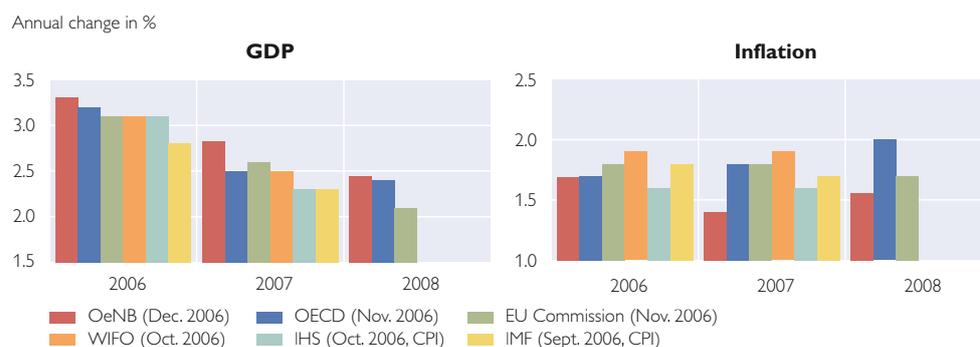
Comparison of Current Economic Forecasts for Austria

Table 10

Breakdown of Forecast Revisions

	GDP			HICP		
	2006	2007	2008	2006	2007	2008
	Annual change in %					
December 2006 outlook	+3.3	+2.8	+2.4	+1.7	+1.4	+1.6
June 2006 outlook	+2.5	+2.2	+2.2	+1.7	+1.6	+1.6
Difference	+0.8	+0.6	+0.2	-0.1	-0.1	-0.0
Due to:						
External assumptions	+0.0	+0.3	+0.1	+0.0	-0.3	+0.1
New data	+0.8	+0.2	-	-0.1	-0.1	-
of which: Revision of historical data until 2006Q1	+0.5	-	-	-	-	-
Projection errors for 2006Q2 and Q3	+0.3	+0.2	x	-0.1	-0.1	x
Other ¹	+0.1	+0.0	+0.1	-0.0	+0.2	-0.1

Source: OeNB December 2006 and June 2006 outlooks.

¹ Different assumptions about trends in domestic variables such as wages, government consumption, effects of tax measures, other rating changes and model changes.

Economic Research (WIFO). The second and the third quarters of 2006 also developed more favorably than had been expected in June. Next to improved external conditions, a higher carry-over effect caused by stronger-than-expected growth in the course of 2006 is responsible for the growth revisions for 2007 (+0.6 percentage point).

The inflation forecast for 2007 was revised downward by 0.2 percentage point to +1.4% owing to the lower oil prices and the reduced level of inflation toward end-2006. The electricity and gas price hikes scheduled for January 2007 in Vienna and the normalization of spreads between petrol and crude oil prices have caused a marginally higher inflation

forecast for 2007 than the modified assumptions taken by themselves would have done. The inflation forecast for 2006 and 2008 remains unchanged.

A comparison of the OeNB's outlook with other available forecasts for Austria clearly shows a positive correlation between the date of publication (and thus the availability of cyclical data) and the amount of projected growth. The OeNB figures for economic growth in 2006 and 2007 are at the upper limit among forecasts. Inflation forecasts and publication dates show a negative correlation, as inflation has been strongly declining since August 2006 and oil prices have been falling.

Annex Detailed Result Tables

Table 11

Demand Components (at Previous Year's Prices)								
Chained volume data (reference year = 2000)								
	2005	2006	2007	2008	2005	2006	2007	2008
	EUR million				Annual change in %			
Private consumption	126,740	129,056	131,941	134,723	+1.5	+1.8	+2.2	+2.1
Government consumption	40,568	40,994	41,572	42,349	+1.9	+1.1	+1.4	+1.9
Gross fixed capital formation	47,591	49,734	51,711	53,176	+1.4	+4.5	+4.0	+2.8
of which: <i>Investment in plant and equipment</i>	18,896	20,136	21,066	21,643	+2.1	+6.6	+4.6	+2.7
<i>Residential construction investment</i>	9,622	10,033	10,385	10,600	+1.1	+4.3	+3.5	+2.1
<i>Investment in other construction</i>	18,948	19,319	19,902	20,569	+1.4	+2.0	+3.0	+3.4
Changes in inventories (including statistical discrepancy)	-476	-605	-461	-402	x	x	x	x
Domestic demand	214,424	219,179	224,763	229,846	+2.0	+2.2	+2.5	+2.3
Exports of goods and services	127,890	137,590	146,525	156,261	+6.9	+7.6	+6.5	+6.6
Imports of goods and services	116,969	123,966	131,914	140,890	+6.1	+6.0	+6.4	+6.8
Net exports	10,921	13,624	14,611	15,371	x	x	x	x
Gross domestic product	225,344	232,803	239,374	245,217	+2.6	+3.3	+2.8	+2.4

Source: 2005: Eurostat; 2006 to 2008: OeNB December 2006 outlook.

Table 12

Demand Components (Current Prices)								
	2005	2006	2007	2008	2005	2006	2007	2008
	EUR million				Annual change in %			
Private consumption	137,103	141,944	147,099	152,584	+3.2	+3.5	+3.6	+3.7
Government consumption	44,471	45,855	47,453	49,292	+4.1	+3.1	+3.5	+3.9
Gross fixed capital formation	50,510	53,653	56,526	58,988	+3.3	+6.2	+5.4	+4.4
Changes in inventories (including statistical discrepancy)	835	645	483	693	x	x	x	x
Domestic demand	232,918	242,097	251,560	261,556	+3.8	+3.9	+3.9	+4.0
Exports of goods and services	133,299	146,676	158,645	171,659	+9.8	+10.0	+8.2	+8.2
Imports of goods and services	121,162	132,287	142,846	154,911	+9.6	+9.2	+8.0	+8.4
Net exports	12,137	14,389	15,798	16,748	x	x	x	x
Gross domestic product	245,056	256,486	267,359	278,305	+4.2	+4.7	+4.2	+4.1

Source: 2005: Eurostat; 2006 to 2008: OeNB December 2006 outlook.

Table 13

Deflators of Demand Components

	2005	2006	2007	2008	2005	2006	2007	2008
	2000 = 100				Annual change in %			
Private consumption	108.2	110.0	111.5	113.3	+1.6	+1.7	+1.4	+1.6
Government consumption	109.6	111.9	114.1	116.4	+2.2	+2.0	+2.1	+2.0
Gross fixed capital formation	106.1	107.9	109.3	110.9	+1.9	+1.6	+1.3	+1.5
Domestic demand (excluding changes in inventories)	108.0	109.9	111.5	113.3	+1.8	+1.7	+1.5	+1.6
Exports of goods and services	104.2	106.6	108.3	109.8	+2.7	+2.3	+1.6	+1.5
Imports of goods and services	103.6	106.7	108.3	109.9	+3.3	+3.0	+1.5	+1.5
Terms of Trade	100.6	99.9	100.0	99.9	-0.6	-0.7	+0.1	-0.1
Gross domestic product	108.7	110.2	111.7	113.5	+1.5	+1.3	+1.4	+1.6

Source: 2005: Eurostat; 2006 to 2008: OeNB December 2006 outlook.

Table 14

Labor Market

	2005	2006	2007	2008	2005	2006	2007	2008
	thousands				Annual change in %			
Total employment	4,159.4	4,194.1	4,238.0	4,275.2	+0.1	+0.8	+1.1	+0.9
of which: Private sector employment	3,682.3	3,717.4	3,762.4	3,802.9	+0.1	+1.0	+1.2	+1.1
Payroll employment (national accounts definition)	3,355.9	3,405.7	3,459.7	3,503.4	+0.6	+1.5	+1.6	+1.3
	%							
Unemployment rate (Eurostat definition)	5.2	4.9	4.7	4.7	x	x	x	x
	% of real GDP							
Unit labor costs (whole economy) ¹	65.5	65.6	66.1	66.6	-0.5	+0.1	+0.7	+0.8
	EUR thousand per employee							
Labor productivity (whole economy) ²	54.2	55.5	56.5	57.4	+2.5	+2.5	+1.8	+1.5
	EUR thousand							
Real compensation per employee ³	32.8	33.1	33.5	33.7	+0.3	+0.9	+1.1	+0.8
	At current prices, EUR thousand							
Gross compensation per employee	35.5	36.4	37.3	38.2	+2.0	+2.6	+2.5	+2.4
	At current prices, EUR million							
Total gross compensation of employees	119,099	123,998	129,074	133,828	+2.6	+4.1	+4.1	+3.7

Source: 2005: Eurostat; 2006 to 2008: OeNB December 2006 outlook.

¹ Gross wages divided by real GDP.

² Real GDP divided by total employment.

³ Gross wages per employee divided by the private consumption expenditure (PCE) deflator.

Quarterly Outlook Results															
	2006	2007	2008	2006				2007				2008			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Annual change in %															
Prices, wages and costs															
HICP	+1.7	+1.4	+1.6	+1.5	+2.0	+1.8	+1.4	+1.8	+1.3	+1.1	+1.5	+1.6	+1.5	+1.6	+1.6
HICP (excluding energy)	+1.2	+1.5	+1.6	+0.7	+1.4	+1.5	+1.5	+1.6	+1.4	+1.4	+1.4	+1.6	+1.5	+1.6	+1.7
Private consumption expenditure (PCE) deflator	+1.7	+1.4	+1.6	+1.6	+1.7	+1.7	+1.7	+1.5	+1.4	+1.3	+1.3	+1.4	+1.5	+1.7	+1.8
Gross fixed capital formation deflator	+1.6	+1.3	+1.5	+1.5	+1.7	+1.7	+1.6	+1.5	+1.3	+1.3	+1.3	+1.3	+1.4	+1.5	+1.6
GDP deflator	+1.3	+1.4	+1.6	+1.2	+1.4	+1.2	+1.4	+1.4	+1.4	+1.4	+1.3	+1.4	+1.6	+1.7	+1.8
Unit labor costs	+0.1	+0.7	+0.8	+0.1	-0.0	+0.3	+0.2	+0.5	+0.8	+0.7	+0.8	+0.6	+0.7	+0.9	+1.2
Nominal wages per employee	+2.6	+2.5	+2.4	+2.5	+2.6	+2.6	+2.7	+2.6	+2.5	+2.5	+2.3	+2.3	+2.3	+2.4	+2.5
Productivity	+2.5	+1.8	+1.5	+2.4	+2.6	+2.3	+2.5	+2.1	+1.7	+1.8	+1.5	+1.7	+1.6	+1.5	+1.4
Real wages per employee	+0.9	+1.1	+0.8	+0.9	+0.9	+0.9	+1.0	+1.0	+1.1	+1.2	+1.1	+0.9	+0.8	+0.7	+0.7
Import deflator	+3.0	+1.5	+1.5	+3.5	+3.3	+2.9	+2.4	+1.9	+1.5	+1.3	+1.3	+1.4	+1.5	+1.6	+1.6
Export deflator	+2.3	+1.6	+1.5	+2.4	+2.3	+2.3	+2.1	+1.8	+1.6	+1.4	+1.4	+1.5	+1.5	+1.5	+1.5
Terms of Trade	-0.7	+0.1	-0.1	-1.1	-0.9	-0.6	-0.3	-0.0	+0.1	+0.2	+0.1	+0.0	-0.0	-0.1	-0.2
Annual and/or quarterly changes in % (real)															
Economic activity															
GDP	+3.3	+2.8	+2.4	+0.7	+0.9	+0.9	+0.9	+0.5	+0.7	+0.7	+0.6	+0.6	+0.6	+0.5	+0.5
Private consumption	+1.8	+2.2	+2.1	+0.4	+0.4	+0.4	+0.6	+0.6	+0.6	+0.5	+0.5	+0.5	+0.5	+0.5	+0.5
Government consumption	+1.1	+1.4	+1.9	+0.3	-0.0	+0.1	+0.6	+0.4	+0.4	+0.3	+0.4	+0.5	+0.6	+0.6	+0.6
Gross fixed capital formation	+4.5	+4.0	+2.8	+1.1	+1.5	+1.6	+1.3	+0.9	+0.6	+0.6	+0.7	+0.7	+0.7	+0.8	+0.8
of which: Investment in plant and equipment	+6.6	+4.6	+2.7	+1.6	+1.6	+1.9	+3.2	+0.3	+0.2	+0.4	+0.5	+0.6	+0.9	+1.0	+1.1
Residential construction investment ¹	+4.3	+3.5	+2.1	+0.9	+1.3	+1.0	+1.6	+0.7	+0.5	+0.5	+0.5	+0.5	+0.5	+0.5	+0.5
Exports	+7.6	+6.5	+6.6	+1.8	+2.0	+1.7	+1.8	+1.3	+1.6	+1.6	+1.6	+1.7	+1.6	+1.6	+1.6
Imports	+6.0	+6.4	+6.8	+1.4	+1.5	+1.7	+2.0	+1.3	+1.5	+1.5	+1.5	+1.7	+1.7	+1.9	+1.8
Contribution to real GDP growth in percentage points															
Domestic demand	+2.2	+2.3	+2.1	+0.5	+0.6	+0.6	+0.7	+0.6	+0.5	+0.5	+0.5	+0.5	+0.5	+0.6	+0.6
Net exports	+1.2	+0.4	+0.3	+0.3	+0.4	+0.1	-0.0	+0.1	+0.1	+0.1	+0.2	+0.1	+0.0	-0.0	-0.1
Changes in inventories	-0.1	+0.1	+0.0	-0.1	-0.0	+0.2	+0.2	-0.2	+0.0	+0.0	-0.0	+0.0	+0.0	+0.0	-0.0
%															
Labor market															
Unemployment rate (Eurostat definition)	4.9	4.7	4.7	5.1	4.9	4.9	4.8	4.8	4.7	4.7	4.7	4.7	4.7	4.7	4.7
Annual and/or quarterly changes in %															
Total employment	+0.8	+1.1	+0.9	+0.1	+0.1	+0.5	+0.2	+0.2	+0.2	+0.2	+0.2	+0.2	+0.2	+0.2	+0.2
of which: Private sector employment	+1.0	+1.2	+1.1	+0.1	+0.1	+0.6	+0.2	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3
Payroll employment	+1.5	+1.6	+1.3	+0.3	+0.4	+0.8	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3	+0.3
Annual and/or quarterly changes in % (real)															
Additional variables															
Disposable household income	+2.7	+2.3	+1.8	+0.8	+0.6	+1.0	+0.5	+0.6	+0.5	+0.5	+0.4	+0.4	+0.4	+0.5	+0.5
% of real disposable household income (saving ratio) and % of real GDP (output gap)															
Household saving ratio	9.4	9.5	9.1	9.3	9.4	9.6	9.5	9.5	9.5	9.4	9.4	9.2	9.2	9.1	9.1
Output gap	-0.9	-0.1	0.3	-1.5	-1.1	-0.7	-0.2	-0.3	-0.2	-0.0	0.1	0.2	0.3	0.4	0.4

Source: OeNB December 2006 outlook. Quarterly values are seasonally adjusted.

¹ Excluding other investment in construction and other investment.

Table 16

Comparison of Current Economic Forecasts for Austria

Indicator	OeNB			WIFO		IAS		OECD			IMF		European Commission		
	Dec. 2006			Oct. 2006		Oct. 2006		Nov. 2006			Sep. 2006		Nov. 2006		
	2006	2007	2008	2006	2007	2006	2007	2006	2007	2008	2006	2007	2006	2007	2008
Annual change in %															
Key results															
GDP (real)	+3.3	+2.8	+2.4	+3.1	+2.5	+3.1	+2.3	+3.2	+2.5	+2.4	+2.8	+2.3	+3.1	+2.6	+2.1
Private consumption (real)	+1.8	+2.2	+2.1	+1.9	+2.1	+2.2	+1.9	+1.8	+2.0	+2.1	x	x	+2.0	+2.1	+1.8
Government consumption (real)	+1.1	+1.4	+1.9	+1.7	+1.5	+1.1	+0.5	+0.9	+0.5	+0.5	x	x	+1.7	+1.6	+1.6
Gross fixed capital formation (real) ¹	+4.5	+4.0	+2.8	+5.0	+4.0	+5.3	+3.6	+4.3	+3.5	+2.6	x	x	+5.6	+3.4	+2.6
Exports (real)	+7.6	+6.5	+6.6	+8.5	+6.1	+4.6	+6.8	+7.5	+6.8	+7.4	x	x	+3.9	+6.1	+5.8
Imports (real)	+6.0	+6.4	+6.8	+7.7	+6.2	+3.9	+6.6	+5.9	+6.6	+7.0	x	x	+2.9	+5.5	+5.5
GDP per employee	+2.5	+1.8	+1.5	+2.0	+1.7	+1.5	+1.2	x	x	x	x	x	+2.8	+2.2	+2.1
GDP deflator	+1.3	+1.4	+1.6	+1.6	+1.7	+1.3	+1.6	+1.5	+1.8	+2.0	+1.7	+1.7	+1.5	+1.8	+1.9
CPI	x	x	x	+1.6	+1.7	+1.6	+1.6	x	x	x	+1.8	+1.7	x	x	x
HICP	+1.7	+1.4	+1.6	+1.9	+1.9	x	x	+1.7	+1.8	+2.0	x	x	+1.8	+1.8	+1.7
Unit labor costs	+0.1	+0.7	+0.8	+1.1	+0.8	x	x	x	x	x	x	x	+0.4	+0.3	+0.7
Payroll employment	+0.8	+1.0	+0.9	+1.5	+1.2	+1.6	+1.1	x	x	x	x	x	+0.7	+0.7	+0.7
%															
Unemployment rate ²	4.9	4.7	4.7	5.0	5.0	4.9	4.8	5.5	5.5	5.5	4.8	4.6	5.1	5.1	5.1
% of nominal GDP															
Current account	x	x	x	1.3	1.2	x	x	2.3	2.6	3.6	1.5	1.7	x	x	x
Government surplus/deficit	-1.3	-1.0 bis -1.6	-0.9 bis -1.4	-1.6	-1.3	-1.7	-0.8	-1.3	-1.6	-1.5	-1.9	-0.9	-1.3	-1.2	-1.0
External assumptions															
Oil price in USD/barrel (Brent)	65.5	64.6	67.2	65.0	65.0	67.0	70.0	60.0	60.0	60.0	69.2	75.5	65.6	66.3	68.0
Short-term interest rate in %	3.1	4.0	3.8	3.1	3.8	3.2	3.8	3.1	3.8	4.0	3.1	3.7	x	x	x
USD/EUR exchange rate	1.25	1.28	1.28	1.25	1.25	1.25	1.28	1.28	1.28	1.28	1.25	1.28	1.25	1.27	1.27
Annual change in %															
Euro area GDP (real)	+2.5 bis +2.9	+1.7 bis +2.7	+1.8 bis +2.8	+2.6	+2.3	+2.5	+2.0	+2.6	+2.2	+2.3	+2.4	+2.0	+2.6	+2.1	+2.2
U.S. GDP (real)	+3.3	+2.4	+2.8	+3.3	+2.5	+3.3	+2.8	+3.3	+2.4	+2.7	+3.4	+2.9	+3.4	+2.3	+2.8
World GDP (real)	+4.9	+4.3	+4.4	+5.0	+4.5	x	x	x	x	x	+5.1	+4.9	+5.1	+4.6	+4.7
World trade	+8.3	+6.3	+6.4	+8.5	+7.5	+8.5	+7.0	+9.6	+7.7	+8.4	+8.9	+7.6	+9.0	+7.4	+7.0

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

¹ For IAS: Gross investment.² Eurostat definition; for OECD: OECD definition.

Limited Pass-Through from Policy to Retail Interest Rates: Empirical Evidence and Macroeconomic Implications

Claudia Kwapil,
Johann Scharler

In this paper we survey empirical evidence on the limited pass-through from policy to retail interest rates and summarize some recent research on potential implications for monetary policy and macroeconomic fluctuations. Empirical evidence suggests that while the pass-through is incomplete in the euro area as well as in the U.S.A., it appears to be higher in the U.S.A. This is especially true for the long-run pass-through. Research in this field suggests that a limited pass-through alters the Taylor Principle. In the case of a perfect pass-through, the Taylor Principle requires that policy rates increase by more than one-to-one with an increase in (expected) inflation. If the pass-through is incomplete, policy rates have to respond by even more to compensate for the smoothing of retail rates. However, the monetary policies currently implemented in the euro area and the U.S.A. seem to satisfy the conditions for a unique and stable equilibrium and thus avoid sunspot shocks. Furthermore, findings in the literature also show that a limited pass-through has implications for the stabilizing role of monetary policy and therefore, fluctuations arising from fundamental shocks.

JEL classification: E32, E44, E52

Keywords: interest rate pass-through, financial systems, stability.

1 Introduction

Monetary policy affects the economy through various transmission channels, e.g. interest rates, exchange rates, asset prices, etc. One of the most important channels of monetary policy is the interest rate channel. The monetary authority sets policy rates; these affect short-term money market rates, which in turn influence medium to long-term market rates, bank retail rates, etc. Borio and Fritz (1995, p. 3) argue that “bank lending rates are a key, if not the best, indicator of the marginal cost of short-term external funding in an economy.” Households and firms take out bank loans in order to finance consumption and investment expenditures. Therefore, the price of bank loans is key in the determination of final demand and consequently inflation in an economy. However, not only bank lending rates but also bank deposit rates are important, as they influence the saving vs. consumption (and the

saving vs. investment) decisions of economic agents.

In this paper we focus on the interest rate channel of monetary policy transmission, in particular on the link between policy rates and bank retail rates. The purpose of this paper is twofold: First, we summarize empirical evidence on the extent of the pass-through to retail rates in the euro area and the U.S.A. and second, we discuss potential implications for monetary policy and macroeconomic stability.

A vast literature on the pass-through to retail interest rates (e.g. Cottarelli and Kourelis, 1994; Mojon, 2000; Angeloni and Ehrmann, 2003; de Bondt et al., 2005) documents that bank interest rates are characterized by a lower variance than money market rates. Put differently, banks typically do not fully adjust retail rates when market rates change. Banks are no neutral conveyors of monetary policy. Consider, for example, that a

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Burkhard Raunig.

central bank wants to counteract overheating in an economy and increases its policy rates, which is reflected in an increase in money market rates. The ultimate effect on the economy will, however, depend on the reaction of those interest rates that are relevant for aggregate demand, e.g. bank retail rates. Thus, a limited pass-through to retail rates will have macroeconomic implications.

From a theoretical point of view, it is not fully understood why retail rates do not track money market rates more closely. There are different explanations: One potential explanation is that the limited pass-through may be interpreted as an implicit contract between the bank and its customers, which arises as a consequence of long-term relationships (Berger and Udell, 1992; Allen and Gale, 2004). That is, banks with close ties to their customers offer relatively stable retail interest rates in order to insulate the customers from volatile market rates. Moreover, a limited interest rate pass-through may also be the consequence of adjustment costs (e.g. Hannan and Berger, 1991; Hofmann and Mizen, 2004), like labor costs, computing costs and notification costs. Because of these costs, banks refrain from frequent interest rate adjustments and change rates only when the gain of the change is larger than the associated costs. Furthermore, in a varying interest rate environment banks can also change other components of a loan or deposit contract, such as collateral requirements, fees, etc. All the causes for rigid retail interest rates mentioned above are similar to the explanations for sticky consumer prices (e.g. Fabiani et al., 2006). Another explanation for a limited pass-through to retail rates is related to

asymmetric information and moral hazard. In particular, banks have an incentive not to raise interest rates by too much, because borrowers who accept a higher rate are likely to be of poor quality. If borrowers take up a loan at a high rate, they are more likely to choose riskier projects, decreasing the expected value of the amount paid back.

Despite its unambiguous implications for the volatility of retail rates, a limited pass-through may have ambiguous consequences for business cycle volatility. On the one hand, the banking sector may contribute to macroeconomic stability by insulating the economy from adverse interest rate shocks. This issue appears to be particularly relevant for bank-based financial systems like the euro area where retail rates play a more important role than in market-based systems like that in the U.S.A. (Allen and Gale, 2000). Issing (2002) argues that since relationship lending is relatively widespread in the euro area, business cycles should be smoother. On the other hand, a limited pass-through also means that monetary policy actions are to some extent absorbed or smoothed by the banking sector. Thus, a limited interest rate pass-through might interfere with the stabilizing role of monetary policy (Scharler, 2006) in the sense that policy-induced changes in short-term market rates are not fully transmitted to the economy. Moreover, a limited pass-through alters the so-called Taylor Principle (described in 3.1), which is an important requirement for macroeconomic stability (Kwapil and Scharler, 2006).

The remainder of the paper is structured as follows: Section 2 summarizes the empirical evidence on the pass-through process from money

market rates to retail rates. Section 3 presents simulations to investigate the effect of a limited pass-through on macroeconomic volatility and the stability criteria of equilibria. Finally, Section 4 summarizes and concludes the paper.

2 Empirical Evidence on the Incompleteness of the Interest Rate Pass-Through

The literature on the pass-through to retail rates distinguishes between the “cost of funds approach” and the “monetary policy approach” (Sander and Kleimeier, 2004). The cost of funds approach focuses on the “price-setting decision” of banks. The cost of funds mainly reflects the opportunity costs that arise for a bank that issues loans and the financing costs for a bank that takes in deposits. One important criterion in this respect is the maturity of the rates; de Bondt (2005) argues that retail bank and market interest rates have to be of comparable maturity to avoid maturity mismatches. Thus, mortgage loans, for example, are better explained by long-term than by short-term interest rates. In contrast to that, the monetary policy approach is interested in the effect monetary policy has on retail rates and includes no other explanatory variables. It focuses solely on the question of how closely retail rates follow policy rates. Following the work of Cottarelli and Kourelis (1994), most of the empirical estimations found in the literature use an equation similar to

$$\Delta r_t = c + \sum_{j=0}^n \alpha_j \Delta i_{t-j} + \sum_{k=1}^m \beta_k \Delta r_{t-k} + \gamma(r_{t-1} - i_{t-1}) \quad (1)$$

where r_t is the retail rate of banks, i_t is the interest rate targeted by the central bank and Δ denotes the differ-

ence operator. As most studies find that the retail rate, as well as the policy rate, are integrated of order 1, it is common to estimate the equation in first differences to avoid the problem of spurious regressions. Thus, a change in retail interest rates is explained by a change in monetary policy rates, the persistence of a change in the retail rate and an error-correction term, which allows for a long-term relationship between the retail and the policy rate. The number of lags $n \leq 6$ and $m \leq 6$ are chosen according to the Akaike Information Criterion.

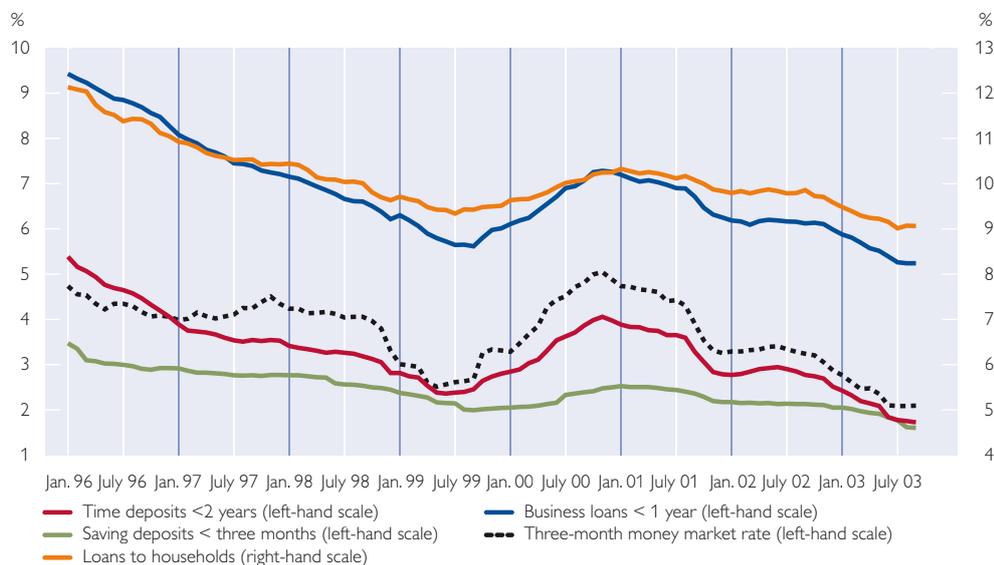
When estimating this equation, one is interested in the immediate pass-through, which is given by α_0 . It gives the reaction of retail rates to a change in policy rates within the same time period. The second piece of information worth looking at is the long-run multiplier λ as defined in equation 2. It shows by how much the retail rate changes in reaction to a change in the policy rate by 100 basis points after all adjustments have taken place. This long-run multiplier is defined as:

$$\lambda = \frac{\sum_{j=0}^n \alpha_j}{1 - \sum_{k=1}^m \beta_k}, \quad (2)$$

where α_j and β_k are the coefficients on the policy rate and the retail rate, respectively, and n and m give the number of lags chosen when estimating equation 1. A high long-run pass-through might, thus, be due to high direct effects passed through from policy rates to retail rates or a high persistence in the retail rates. If λ is equal to 1, the pass-through is said to be complete in the long run and changes in policy rates are to the full extent transmitted to retail rates.

Chart 1

**The Pass-Through from Money Market Rates to Bank Retail Rates
in the Euro Area¹**



Source: BIS.

¹ Chart 1 presents synthetic euro area aggregates from January 1996 to September 2003.

As monetary policy rates and short-term money market rates (e.g. the three-month money market rate) move closely together, money market rates are often taken as proxies for policy rates. Additionally, policy rates are constant for long time periods and change only when policy decisions are taken, which makes them less suitable for econometric purposes. That is why we use money market rates instead of policy rates in the following analysis.

Chart 1 shows the three-month money market rate (dotted line) as a proxy for policy rates and four selected retail interest rates from the euro area. We chose two deposit rates and two lending rates with different maturities. Chart 1 shows quite clearly that the pass-through differs depending on the type of retail rate. While the interest rate on saving deposits with a maturity of less than three months is relatively constant and features a low pass-through, the interest rate on time deposits with a

maturity of less than two years moves more in line with the money market rate. A similar picture emerges from retail lending rates. While the interest rate on loans to households does not fluctuate much and, thus, has a low pass-through, the interest rates on short-term business loans moves quite in parallel with the money market rate. This pattern of considerable differences in the pass-through depending on the type of retail interest rates found for the euro area is a common finding in the literature. Mojon (2000), Sander and Kleimeier (2004), de Bondt (2005) and Kwapil and Scharler (2006) share the result that deposit rates with short maturities (e.g. overnight deposits, saving deposits) have a lower pass-through than deposit rates with longer maturities (e.g. time deposits). Furthermore, Sander and Kleimeier (2004), de Bondt (2005) as well as Kwapil and Scharler (2006) find that interest rates on short-term loans to corporations (prime rate) feature a higher

Table 1

The Pass-Through from Money Market Rates to Retail Rates in the Euro Area

	Deposit rates		Lending rates	
	immediate	long-term	immediate	long-term
Mojon (2000)	0.27	x	0.53	x
Angeloni and Ehrmann (2003)	0.38	0.74	0.38	0.74
Sander and Kleimeier (2004)	~ 0.20	0.62–0.68	~ 0.20	0.40–0.47
de Bondt (2005)	0.00–0.35	0.35–0.98	0.13–0.54	0.92–1.53
de Bondt et al. (2005)	0.36	0.68	0.04–0.38	0.48–0.74
Kwapil and Scharler (2006)	0.16	0.32	0.34	0.48
Kaufmann and Scharler (2006)	x	x	0.48	x
Kleimeier and Sander (2006)	0.10–0.45	0.25–0.80	0.25–0.45	0.65–0.75
Sorensen and Werner (2006)	x	0.15–0.84	x	0.38–1.17

Note: Angeloni and Ehrmann (2003) estimate the immediate pass-through for the euro area using an average of deposit and lending rates.

pass-through than medium to long-term lending rates.

Table 1 summarizes the findings of the literature on the immediate and the long-term pass-through for the euro area, where most authors listed in the table use an equation similar to (1). In general the authors use monthly data, implying that the immediate pass-through reflects the response of retail rates to changes in money market rates within the same month. Exceptions are Mojon (2000), who reports the response after three months as well as Kaufmann and Scharler (2006), who use quarterly data; thus, the immediate pass-through gives the response within the first quarter.

A problem in comparing results in the literature is that the authors cover different time periods and use different data sources. Furthermore, some use euro area aggregates, while others take the average of country results of only a few euro area countries and, thus, use only a proxy for the euro area. In some cases table 1 includes ranges instead of point estimates. Ranges are given if the authors report estimates of the pass-through to various retail interest rates.

Table 1 shows that there are considerable differences in the estimates of pass-throughs in the euro area. However, the differences are not bigger across studies than across retail interest rates within one study as indicated by the ranges given in table 1. The first common finding is that the adjustment of retail rates to changes in money market rates does need some time and does not occur instantaneously, as the immediate pass-through is smaller than the long-term pass-through. This seems to be true for deposit rates as well as for lending rates. The second common finding is that the immediate pass-through seems to be below 0.55 in all cases. This means that only around half of the change in money market rates is immediately passed through to retail interest rates. For the long-term pass-through the range of estimates is bigger. However, the results seem to suggest that with only few exceptions, the long-term pass-through in the euro area is below 1 and, thus, not complete. This indicates that banks indeed insulate their customers from volatile money market rates by absorbing part of the changes.

Table 2

The Pass-Through from Money Market Rates to Retail Rates in the U.S.A.

	Deposit rates		Lending rates	
	immediate	long-term	immediate	long-term
Cottarelli and Kourelis (1994)	x	x	0.41	0.97
Borio and Fritz (1995)	x	x	0.34	0.79
Moazzami (1999)	x	x	0.34	1.05
Sellon (2002)	x	x	x	1.00
Angeloni and Ehrmann (2003)	0.74	1.30	0.74	1.30
Kwapil and Scharler (2006)	~1.00	~1.00	0.79	0.57
Kaufmann and Scharler (2006)	x	x	0.92	~1.00

Note: Angeloni and Ehrmann (2003) estimate the immediate pass-through for the euro area using an average of deposit and lending rates.

Table 2 summarizes pass-through estimates for U.S. retail interest rates. Also for the U.S.A., one has to keep in mind that the authors use different data sets and cover different time periods. The estimates for the pass-through in the U.S.A. seem to be higher than in the euro area, and most of the studies seem to suggest that the pass-through to U.S. retail rates is nearly complete in the long-run.

3 Macroeconomic Implications

Since empirical evidence indicates that the pass-through to retail rates is incomplete, the question of what the macroeconomic implications of this stylized fact are remains. On the one hand, one would expect that the economy is less exposed to interest rate shocks. That is, shocks to the overall liquidity situation on financial markets have a smaller impact on households and firms. This argument applies in particular to bank-based economies like the euro area. Angeloni and Ehrmann (2003, p. 10) argue that banks are important for the transmission of monetary policy in

the euro area, “given their overwhelming role in financial intermediation in continental Europe.” Thus, it appears plausible that the euro area economy experiences smoother business cycles than a more market-based system, as for instance the U.S.A.¹ However, a limited pass-through to retail rates also has the implication that monetary policy is less effective in the sense that policy-induced changes in short-term market rates are not fully transmitted to the economy.

In this section we focus on how a limited pass-through influences the behavior of the economy in the face of two different types of shocks. The first type is the so-called “sunspot shock,” which refers to self-fulfilling revisions in inflationary expectations. Several authors argue that precisely these shocks were a major source of macroeconomic instability in the 1970s (e.g. Clarida et al., 2000). The second type of shock is a fundamental shock. Scharler (2006) analyzes liquidity shocks, which are shocks to the borrowing needs of firms, as examples of fundamental shocks.

¹ Of course, differences in business cycle characteristics across countries may be due to various reasons, e.g. different rigidities, different types and magnitudes of shocks and their propagation mechanism. However, different financial systems may be a potential explanation for these differences in business cycle characteristics.

3.1 Limited Pass-Through and the Taylor Principle

Several authors claim that the so-called Taylor Principle has important implications for macroeconomic fluctuations. Basically, the Taylor Principle holds that the nominal interest rate has to respond more strongly than one-for-one to changes in the inflation rate to avoid self-fulfilling revisions in expectations. Intuitively, if nominal rates do not adjust sufficiently, a rise in expected inflation leads to a decrease in the real interest rate, which stimulates aggregate demand. Higher aggregate demand results in an increase in inflation, and consequently the initial expectation is confirmed. An economy subject to this type of “sunspot shocks” will be highly unstable, and business cycles will be characterized by large fluctuations.

Consider a simple Taylor Rule as a description of monetary policy:

$$i_t = \rho i_{t-1} + (1 - \rho)(\kappa_\pi \pi_t + \kappa_y y_t), \quad (3)$$

where i_t denotes the nominal interest rate targeted by the central bank, ρ is the degree of policy inertia and κ_π and κ_y determine the response of monetary policy to changes in inflation (π_t) and the output gap (y_t), respectively. Clearly, the Taylor Principle is satisfied if $\kappa_\pi > 1$. Otherwise, an increase in inflation would lead to an increase in the nominal interest rate by less than one and would thus induce a decline in the real interest rate.

However, as shown in Kwapil and Scharler (2006), the standard Taylor Principle is not sufficient to rule out

fluctuations due to self-fulfilling expectations when the interest rate pass-through is limited. Put differently, although monetary policy appears to be tightened sufficiently, retail interest rates do not respond sufficiently to ensure that real rates are stabilizing. It is shown that in this case a modified Taylor Principle applies: $\kappa_\pi \lambda > 1$, where λ denotes the long-term pass-through to retail rates.² The intuition is straightforward: For low values of λ , changes in the monetary policy rate are to a large extent absorbed by the banking sector and not passed on to households and firms. Hence, if expected inflation increases, monetary policy has to be tightened considerably to have a stabilizing effect on aggregate demand. For $\lambda = 1$ the pass-through to retail rates is complete at least in the long run, and we obtain the standard Taylor Principle.

Ultimately, our aim is to analyze how the pass-through process to retail interest rates influences equilibrium determinacy and macroeconomic stability. Empirical evidence surveyed in the previous section suggests that for the U.S.A., the long-run pass-through to retail rates is higher than in the euro area. Moreover, the banking sector and therefore retail rates play only a relatively minor role for the determination of U.S. aggregate demand (e.g. Allen and Gale, 2000). Thus, we may conclude that κ_π , which ensures a determinate equilibrium, is likely to be higher in the euro area than in the U.S.A.

² Strictly speaking, this modified Taylor Principle applies to the case $\kappa_y = 0$. However, for empirically plausible values for κ_y , differences are negligible.

Do the monetary policy rules estimated for the European Central Bank and the Federal Reserve Bank satisfy the modified Taylor Principle? For the U.S.A., Clarida et al. (2000) find a value of 2.15 for κ_π for the Volcker-Greenspan period. Based on real-time-data, Orphanides (2004) reports lower values of around 1.8. For the euro area, Gerdesmeier and Roffia (2004) estimate several specifications. Based on their preferred specification, they obtain estimates ranging from 1.9 to 2.2. A precise evaluation is complicated, since retail rates are only one category of interest rates relevant for the determination of aggregate demand. However, the estimated values for κ_π appear to fall within the determinate region for both economies. Nevertheless, the euro area, with its more bank-based system and its smaller pass-through to retail rates, may be closer to the indeterminate region than the U.S.A.

3.2 Limited Pass-Through and the Transmission of Liquidity Shocks

How does a limited pass-through influence the response of the economy to fundamental shocks? Scharler (2006) addresses this question within a New Keynesian business cycle model where fluctuations arise due to liquidity shocks. Firms have to borrow working capital to finance production. In particular, a fraction of the wage bill has to be paid in advance of production, and stochastic fluctuations in this fraction are interpreted as liquidity shocks. The paper focuses on these shocks, which may be interpreted more generally as shocks to the demand for credit, since the role of the banking sector as a shock absorber might be particularly relevant to such liquidity shocks.

In this model, a liquidity shock raises the borrowing needs of firms, increasing their interest payments on the working capital and making production more costly. This affects the supply and pricing decision of the firm. Higher costs of the working capital are likely to lead to decreases in the volume of production and upward price adjustments. The increase in inflation leads to a monetary policy response and thus to an increase in the policy interest rate, which in turn leads to an increase in lending rates and raises costs even further by making working capital more expensive. Thus, the response of monetary policy tends to amplify the shock. Interest rate smoothing by the banking sector dampens the increase in inflation and therefore leads to a smaller increase in policy rates. Consequently, a limited pass-through reduces the volatility of business cycles in this setup. However, quantitatively, the reduction in volatility is found to be small. Thus, a financial system that only insulates the business sector of the economy against liquidity shocks increases macroeconomic stability only marginally.

However, liquidity shocks affect aggregate demand more generally. Since monetary policy is tightened in response to the liquidity shock, it is not just corporate lending rates which are increased, but retail rates in general. Hence, in addition to the initial liquidity shock, the economy faces an aggregate demand shock, as households delay consumption. Simulations show that if the long-run pass-through to retail rates in general is incomplete, meaning that banks do more than just smooth fluctuations in the policy rate, but partly absorb these fluctuations even in the long run, then larger reductions in aggregate

volatility are obtained. However, the lower volatility of output in this case comes at the cost of a more volatile inflation rate. This result can be understood in terms of how an imperfect interest rate pass-through alters the Taylor Principle and the stability properties of the model. Although we have seen that monetary policy rules estimated for the euro area and the U.S.A. rule out sunspot shocks, limited pass-through also influences how the economy responds to fundamental shocks. Intuitively, lowering the long-run interest rate pass-through while keeping the policy response to inflationary pressure fixed implies that monetary policy becomes more accommodating. Hence, the inflation rate becomes more volatile. Put differently, a limited long-run pass-through alters the trade-off between output and inflation stabilization faced by the central bank. If banks absorb policy-induced variations in interest rates even in the long run, as the empirical findings suggest, monetary policy in some sense becomes more accommodating toward inflationary pressures.

4 Summary

In this paper, we survey empirical evidence on the limited pass-through from policy to retail interest rates. In addition, we summarize some recent research on potential implications for

monetary policy and macroeconomic fluctuations which arise from a limited pass-through.

Empirical evidence suggests that while the pass-through is incomplete in the euro area and in the U.S.A., it appears to be higher in the U.S.A. This is especially true for the long-run pass-through.

What are the implications for macroeconomic fluctuations? Despite the result that a limited pass-through alters the Taylor Principle, we conclude that currently implemented monetary policy rules in the euro area and the U.S.A. are likely to satisfy the conditions for a determinate equilibrium. Put differently, even after taking limited pass-through into account, sunspot fluctuations are unlikely to arise. However, a limited pass-through still has implications for the stabilizing role of monetary policy and therefore fluctuations arising from fundamental shocks. Given the empirical evidence in favor of a limited long-run pass-through, any reduction in output volatility that is due to liquidity smoothing by the banking sectors is likely to be accompanied by a more volatile inflation rate. Moreover, in addition to the characteristics of an interest rate rule, the long-run pass-through to retail rates has to be taken into account for the evaluation of monetary policy.

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Globalization, Inflation and Monetary Policy

Following up on Glatzer, Gnan and Valderrama (2006), we investigate two further channels through which globalization may have dampened inflation in the euro area: first, changed incentives for policymakers; second, global demand and supply conditions. Our empirical evidence shows that the domestic output gap seems to have lost its influence on inflation in the euro area; however, we cannot confirm that euro area inflation is instead significantly influenced by the global output gap. Therefore and because of daunting measurement problems, we caution against attaching undue weight to global output gap developments in central banks' reaction functions. The flattening of the euro area Phillips curve – together with weakened monetary policy control over inflation due to increasing global long-term interest links and heightened uncertainty for policymakers due to globalization – calls for the stabilization of inflation expectations as a primary goal for monetary policy. Central banks should not rely on the inflation-dampening effects of globalization to last indefinitely: Supply bottlenecks in energy and raw materials, a shift in emerging economies' savings-investment balance, as well as protectionist pressure may put an end to these effects.

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JEL classification: E31, E50, F15

Keywords: globalization, inflation, monetary policy.

1 Introduction

Global inflation followed a distinct downward trend during the 1980s and 1990s. In recent years, inflation rates remained at low levels, despite massive increases in the prices of energy and raw materials. There is a general perception that globalization has facilitated this favorable inflation record and that inflation is increasingly influenced by global, rather than national, determinants.

Glatzer, Gnan and Valderrama (2006) identified six broad channels through which globalization² may have influenced inflation and explored in some detail microeconomic determinants such as import prices and competitiveness effects on inflation in Austria. The present study is a follow-up and elaborates on two macroeconomic channels through which globalization may have dampened in-

flation. First, the notion that central banks worldwide did a better job in reducing inflation and keeping it low is developed in various directions. Second, the idea that global, rather than domestic, developments of aggregate demand and capacity constraints influence inflation in the short term is discussed and tested empirically for the euro area.

The remainder of this article is structured as follows: Section 2 provides an overview of the current state of the economic literature on how globalization may have altered monetary authorities' objective function. Section 3 discusses how globalization can influence the sensitivity of inflation to output fluctuations. Section 4 investigates empirically whether inflation in the euro area has increasingly become influenced by global, rather than domestic, output gap

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² As in Glatzer, Gnan and Valderrama (2006), we define (economic) globalization as the growing economic interdependence of countries worldwide, brought about by an increasing volume and variety of cross-border transactions in goods and services as well as by the higher mobility of factors of production, including a more rapid and widespread international diffusion of technology.

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Andrew Filardo, BIS.

developments. Section 5 draws conclusions.

2 Globalization Has Strengthened Monetary Authorities' Commitment to Price Stability and Anchored Inflation Expectations

The notion is widely shared that the global decline in inflation is, at least to some extent, the result of monetary policies credibly geared toward price stability. Indeed, several studies document empirically that central banks responded more aggressively to inflation in the 1980s and 1990s than in the two previous decades (Taylor, 1999; Clarida et al., 2000). But what is the source of such stronger commitment?³

2.1 Globalization Changes Economic Structures, Reducing Central Banks' Incentives to Boost Output beyond Potential

Globalization may have changed monetary policymakers' objective function and may thus have contributed to lower inflation through various channels.

A *first* reasoning starts from the proposition that monetary policymakers have an incentive to create "surprise inflation" (i.e. an increase in the inflation rate not anticipated by economic agents) to generate a temporary increase in real output and employment. The possibility to do so crucially hinges on price and wage rigidities, which entail that prices and wages do not immediately react to

unexpected monetary expansion. As globalization increases competition and makes prices and wages more flexible, the real effects of monetary policy become smaller and shorter-lived. In other words, it takes a bigger acceleration in inflation to achieve the same temporary increase in real output; the short-run Phillips curve becomes flatter.⁴ As a corollary, it also takes bigger interest rate hikes to curb inflation once it has risen.⁵ For both reasons, the incentive to use monetary policy as a tool (albeit short-lived) to boost output beyond the economy's potential diminishes, and monetary policy concentrates on the policy variable that it ultimately determines, i.e. the general price level (Rogoff, 2003). In line with this reasoning, Chen et al. (2004) estimate that the squeeze on markups caused by increased competition arising from globalization lowered central banks' preferred rate of inflation in EU countries by more between 1988 and 2000 than the direct inflation-dampening effect of lower import prices did.

Second, it has been argued that higher openness increases the cost of unexpected inflation. In Romer (1993), this is so because a more open economy suffers more from the negative terms-of-trade effect of a real exchange rate depreciation associated with unexpected monetary expansion. In Lane (1997), the reduced incentive to create surprise inflation in more open economies is due to a lower share of monopolistically produced nontradable goods in con-

³ For a policy-oriented analysis of how globalization may have influenced monetary policy, see also BIS, 2006.

⁴ Galati and Melick (2005) provide a survey of recent empirical studies which confirm a recent flattening of the short-run Phillips curve in many countries. See also Stock and Watson (2005).

⁵ Vega and Winkelried (2005) show theoretically and empirically that as domestic expenditure in tradable goods increases relative to nontradable goods, the conventional interest rate channel of monetary policy on inflation weakens.

sumption,⁶ which reduces the welfare gain from stimulating production in nontradable goods. Empirical estimates by both authors confirm that more open economies indeed experience lower inflation rates. This result is robust to the inclusion of various additional explanatory variables, such as central bank independence. Gruben and McLeod (2004) find that the negative openness-inflation correlation strengthened across all country groups during the 1990s.⁷ Razin and Loungani (2005a, b) argue that capital account liberalization allows consumers to smooth fluctuations in consumption, reducing the dependence of domestic demand on the domestic output gap. At the same time, trade openness fosters specialization in production, which increases distortions associated with fluctuations in inflation rates. Thus, policymakers seeking to maximize welfare should put more weight on inflation stabilization and respond less to output gap fluctuations in more open economies.

Third, it has been argued that more flexibility in labor markets and in nominal wages may lower the optimal inflation rate, since the costs of possible temporary deflation⁸ is reduced (Borio and Filardo, 2006).

Finally, as Wagner (2002) argued, businesses and foreign investors may regard inflation as a signal of bad economic policy and political and eco-

nomical instability. As globalization increases competition among countries to attract companies and foreign investment, it may also be expected to strengthen policymakers' incentive to safeguard price stability.

2.2 Changed Incentives for Legislators and Global Benchmarking Foster Central Bank Independence

The above arguments have described ways in which globalization may have strengthened policymakers' quest for price stability. These mechanisms could in principle have contributed to lower inflation outcomes without any changes to central bank laws. However, over the past two decades central bank laws were globally modified to grant central banks higher independence, and central banks were mandated to safeguard price stability as their primary goal. Thus, the question has been raised (Rogoff, 2003) whether the worldwide decline in inflation was primarily driven by changes in economic structures (which were in turn supported by globalization) or by better monetary policy institutions. Indeed, the two explanations may be related. Much the same as globalization may have strengthened monetary authorities' quest for price stability for the reasons described above, it may – together with other factors, such as the

⁶ Monopolistic production of nontradables entails a level of output in these products which is socially too low. Therefore, stimulating non-traded output through unanticipated monetary expansion creates welfare gains.

⁷ Contrary to claims by Terra (1998), the effect is not confined to highly indebted countries. This is also found by Gupta (2003).

⁸ Downward rigidity of nominal wages and prices are often quoted as a rationale for central banks to aim for low but positive inflation rates rather than price level stability. This is one of the reasons why e.g. the Eurosystem has defined price stability as an annual increase of the euro area HICP of below but close to 2%. If globalization contributes to reducing nominal downward wage and price rigidities, this reduces the required "safety margin" from zero inflation. Research in the context of the Eurosystem's Inflation Persistence Network has found that goods prices in the euro area are quite flexible downward; however, services prices as well as wages continue to be an important source of nominal rigidities (for a policy-oriented summary see Crespo Cuaresma and Gnan, 2005; Gnan, 2005).

experience of the inflation of the 1970s and 1980s and new theoretical insights – also have contributed to persuading legislators to change central bank legislation toward independence and price stability.

Second, the wave of new central bank legislation may also have reflected a tendency toward global “benchmarking” for stability-oriented monetary institutions. Globalization in that sense also implies an easier and faster spillover of “monetary policy technologies” in much the same way as technological spillovers in other areas have been facilitated. But global institutions such as the International Monetary Fund (IMF) also actively encouraged such policy and institutional benchmarking processes. In the EU, the Maastricht Treaty has also supported institutional and legal benchmarking: Its convergence provisions require EU governments to grant the national central banks legal independence prior to a country’s participation in Stage Three of EMU.

2.3 Increased “Threat of Devaluation” Supports Monetary Discipline

Globalization also importantly includes the liberalization of the international flow of capital. Thus, in a globalized economy, inflationary monetary policies risk more severe and immediate consequences than among rather closed economies with nationally segmented financial markets (Tytell and Wei, 2004); an unanticipated monetary expansion will likely be accompanied by exchange rate devaluations. In a small open economy, such a development will exacerbate inflationary consequences, while positive growth and employment effects will be dampened through higher imported intermedi-

ate goods prices and nominal wages rising in tandem with the increased inflation rate (Rogoff, 2003; Romer, 1993). In the case of fixed exchange rate regimes, the incentive for monetary discipline may be complemented by the threat of speculative attacks and market-forced devaluations.

2.4 Better Informed Monetary Policy and Strategic Frameworks to Maintain Price Stability, or Simply “Good Luck” and “Opportunistic Behavior”?

It has been argued that monetary policy was better informed over the past two decades by new theoretical insights, by a wider range of and more reliable data, by more advanced analytical and empirical tools, and, last but not least, by central bankers’ learning from past mistakes, in particular from the “Great Inflation” of the 1970s and 1980s (Gnan and Wittelsberger, 1999, 2003; BIS, 2006; Galati and Melick, 2005). An alternative view is that the good inflation performance of the past two decades is largely, if not entirely, due to “good luck.” According to this line of argument, fewer adverse shocks have hit the economy, thus making it easier now to maintain price stability. Part of this good luck may be attributed to favorable shocks linked to globalization. However, most empirical studies conducted on this question find that good luck played only a small part in explaining the decline in inflation (Stock and Watson, 2005; Ahmed et al., 2004; Galati and Melick, 2006).

Finally, according to the “opportunistic approach to disinflation” (Orphanides and Wilcox, 2002; Aksoy et al., 2003), central banks may also have used the tailwind of

price-dampening supply side shocks associated with globalization to permanently lock in lower inflation rates which would otherwise have been costly to achieve.

2.5 Globalization May Have Dampened Inflation Expectations

Globalization may also have dampened inflation expectations, in turn reducing actual inflation. Several arguments for this have been put forward: *First*, if economic actors understand that central banks are more committed to the primary objective of maintaining price stability (which may in turn be related to globalization), their expectations about future inflation fall. *Second*, the lower actual inflation – even if it had partly been due to “good luck” or “opportunistic behavior” – may have bolstered central banks’ credibility, thus amplifying the inflation dampening effect of the original positive supply shock. *Third*, economic agents perceiving that globalization puts downward pressure on prices and wages may lower their inflation expectations regardless of the other factors just mentioned. Put differently, they would expect future positive supply shocks from globalization. The notion that inflation expectations have become better anchored is in line with evidence quoted above on a flattening of the short-run Phillips curve.

3 Globalization May Have Weakened the Link between Domestic Demand and Inflation

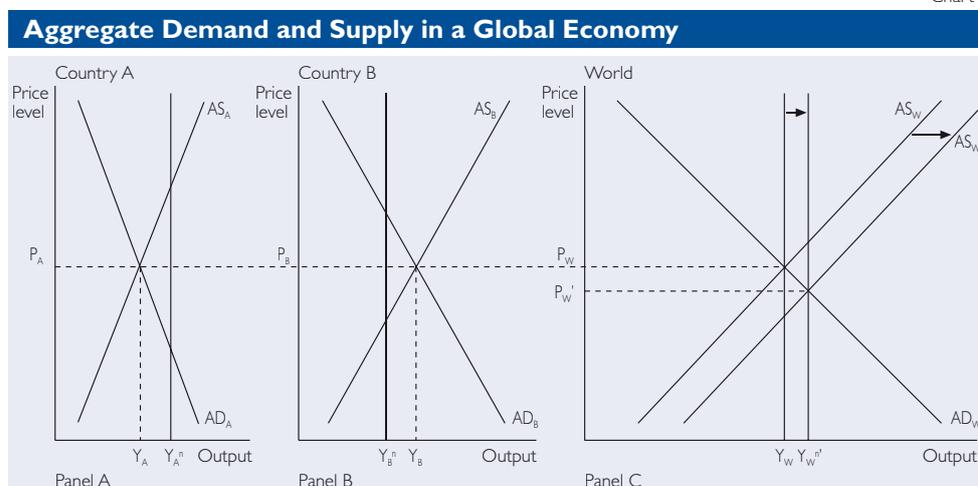
3.1 A Stylized Model of Global Aggregate Demand and Supply

In a closed⁹ economy, the price level or inflation are influenced in the short run by the balance between domestic aggregate demand and the economy’s production potential, i.e. the output gap. If short-run equilibrium output is above the economy’s long-run equilibrium, the price level or the inflation rate increase; in the event of slack, the price level or inflation falls.

Opening up an economy to foreign trade and foreign capital flows allows the trade balance to be in surplus or in deficit. Net imports of goods and services can make up for a lack of domestic supply and net exports can make up for a lack of domestic demand. Inflation in open economies will be less influenced by domestic supply and demand conditions. Instead, foreign supply and demand conditions as well as international inflation and exchange rate developments should play an increasingly important role for an individual country’s inflation rate. In a (hypothetically) fully globalized world with frictionless international movement of goods, services, capital and labor, inflation would in the short term be influenced to a large extent by the global balance of demand and supply. Globalization could thus be expected to have diminished the influence of domestic economic conditions on in-

⁹ For the sake of simplicity, we do not address exchange rates in this stylized description of supply and demand effects. Clearly, in reality, the choice of exchange rate regime and (nominal and real) exchange rate developments can influence demand and supply schedules. For a further discussion, see Borio and Filardo (2006) and BIS (2006).

Chart 1



Source: OeNB.

Note: AS stands for aggregate supply, AD for aggregate demand, Y^n for natural rate of output.

flation, while increasing the importance of global developments.

The shift from domestic to global influences of the aggregate price level can be illustrated within a strongly simplified framework of aggregate demand and aggregate supply in two countries.¹⁰ In the example sketched in chart 1, country A is currently in a recession, i.e. it operates below its potential Y_A^n , while country B experiences a boom, i.e. its production is above its potential Y_B^n . If both economies were closed, country A would experience falling prices (or more realistically, in a dynamic setting, falling inflation rates), while in country B the price level would increase (inflation) until both economies have, each for itself, reached their individual levels of potential output again.

Panel C of chart 1 illustrates the effect of globalization. As companies now can freely trade goods and services as well as factors of production, the production possibilities of the two

economies are now added up into a single global production schedule. Similarly, as consumers, firms and the government can purchase goods, both at home and abroad, aggregate demand of the two economies is represented by the new global aggregate demand schedule.

Note further that the global aggregate supply schedule is not obtained by simply adding up the individual supply schedules of the two closed economies. As argued in Glatzer, Gnan and Valderrama (2006), globalization is likely to boost productivity (through comparative advantage, economies of scale, competition, innovation, etc.). Thus, world potential output will be more than the sum of individual countries' output: This is graphically indicated by global potential output, Y_W^n in panel C being more than the sum, Y_A^n , of the individual countries' potential output levels. As a consequence, the global aggregate supply curve AS_W shifts to the right

¹⁰ For details, see standard macroeconomics textbooks, e.g. Blanchard (2005).

and the price level (or, more realistically, inflation) will fall. Let us now use chart 1 to consider three aspects of global demand and supply, and their effects on global prices and on inflation.

3.2 Does Globalization Cause Stronger Compensatory Effects among Worldwide Business Cycles?

First, in the short run, at a business cycle frequency, the effects of globalization on inflation and its variability are influenced by whether individual countries' business cycles are synchronized or not (Gamber and Hung, 2001). In chart 1 this translates into the two AD curves moving to the right and to the left in tandem or independently of each other or even in opposite directions. If they move in tandem, this would imply that booms and recessions of individual countries add up at the global level, as do (dis)inflationary phases. If business cycles were independent of each other or even moved in opposite directions, scarce and excess capacities across countries would compensate each other over the business cycle, thus smoothing global cyclical ups and downs in production and inflation. This very special case is assumed for illustrative purposes in chart 1. While country A is in recession, country B experiences a boom, and the two countries' excess and slack capacities compensate each other. Whether this "compensatory" effect operates in practice depends on how synchronized global business cycles are. Chart 2 suggests quite parallel business cycle movements between the euro area and the world. Economet-

ric studies yield a more ambiguous picture. A number of empirical studies (Stock and Watson, 2003; Helbling and Bayoumi, 2003) find strong evidence for an important role of common global factors driving business cycles among advanced countries but far less so in developing countries. It is also unclear whether business cycle synchronicity has more increased or decreased over time. Considering that globalization has more recently been characterized by the inclusion of emerging economies in the international division of labor, compensatory capacity effects among countries might indeed play some role.¹¹

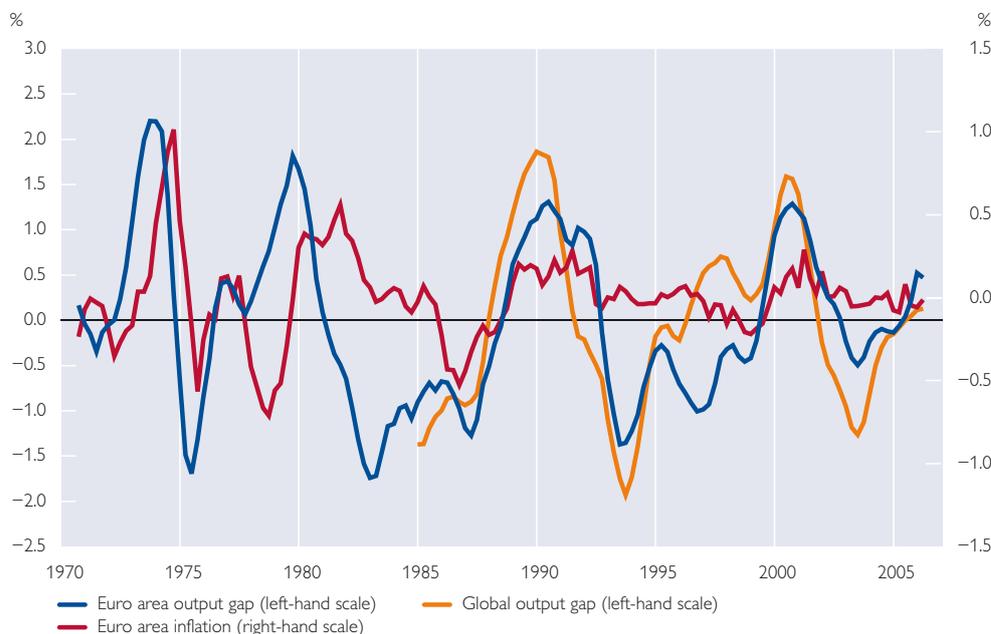
3.3 Productivity and Price Shocks Due to Globalization Alter Aggregate Supply Conditions

A second consideration linked to global demand and supply relates to the effects of globalization on aggregate supply schedules. It was mentioned above that globalization leads to gains in world potential output. The resulting shift to the right in the AS_w schedule might over the medium to long run, other things being equal, dampen the price level and inflation. However, some aspects of globalization can also shift aggregate supply upwards and dampen world potential output, e.g. increases in oil and raw material prices that are due to the strong and lasting increase in global demand for these resources (Arpa et al., 2006). The fact that major forecasting institutions have consistently underpredicted inflation in the euro area since the start of EMU while repeatedly overpredicting output growth (Korteweg and Masuch, 2005) is consistent with a series of

¹¹ For a policy-oriented survey, see Kose (2004).

Chart 2

Euro Area: Inflation, Domestic and Foreign Output Gaps



Source: ECB, Borio and Filardo (2006).

supply-side shocks – including oil and energy price rises – hitting the euro area.

3.4 Globalization Triggers a Shift in the Savings-Investment Balance

A third aspect of global demand and supply addresses longer-lasting structural shifts in aggregate demand schedules. Part of the inflation-dampening effect of globalization over the past years arose from the strong expansion of productive capacity in emerging countries such as China and India (a rightward shift in their potential output and AS schedules), which was not accompanied by a proportional increase in aggregate demand (their AD schedule did not move to the same extent). Besides resulting in high rates of domestic investment, the very high savings ratios in these countries were also reflected in sizeable trade surpluses. As emerging countries make progress with their economic catching-up process, shown

inter alia by increasing personal disposable income levels, their propensity to consume might increase (their AD curve would with a delay, follow increased aggregate supply). Exchange rate appreciations might accompany and accelerate this adjustment process. Once aggregate demand catches up with aggregate supply, emerging countries' influence on the global balance of demand and supply would change, and the price- and inflation-dampening effect would fade out.

3.5 Globalization Increases Monetary Policymakers' Uncertainties

The structural shifts in individual countries' and world global aggregate supply and demand conditions which may be triggered by globalization are likely to increase the degree of uncertainty that monetary policymakers face. The higher uncertainty results from difficulties in interpreting indicators such as the output gap and the

natural rate of interest¹². Identifying inflationary pressures emanating from domestic and global demand and supply conditions, including import and raw material prices becomes more difficult. The monetary transmission mechanism is likely to change (Wagner, 2002; BIS, 2006). Spillovers from foreign economic developments and economic policies are likely to increase.

4 Is Inflation in the Euro Area Increasingly Influenced by Global Business Cycle Developments?

In this section we explore whether inflation in the euro area has recently been increasingly influenced by global rather than domestic business cycle developments. To test such an effect, empirically, we rely on a reduced-form model that relates inflation to a measure of excess demand and a measure of supply shocks from abroad. In this kind of “Phillips curve,” it is usually found that parameters are unstable due to the Lucas critique.¹³ But parameters are also expected to be unstable because of the progressive evolution of globalization. Thus, the hypothesis we test is that the relation-

ship between domestic excess demand and inflation has weakened over time due to the process of globalization. In a second step, we test whether including a measure of external excess demand has explanatory power beyond that of the domestic output gap, and whether this result changes over time.

As chart 3 shows, output gap measures of the euro area and those of the global economy¹⁴ tend to move together for long periods. Thus, estimating an equation with both measures of excess demand simultaneously will probably suffer from multicollinearity. On the other hand, simply replacing the domestic output gap with the foreign output gap in the estimated equation would yield no or little additional information, since both variables are highly synchronized.¹⁵ Thus, as an additional explanatory variable, we include a measure of foreign output gap to the extent that it deviates from the domestic output gap.¹⁶

To test our hypothesis that the relationship has weakened over time, we allow the coefficients of the domestic and foreign output gaps to vary over time.¹⁷

¹² For a discussion of the possible effects of globalization on the natural rate of interest, see Crespo Cuaresma et al. (2005) and BIS (2006).

¹³ See for example Turner (1997).

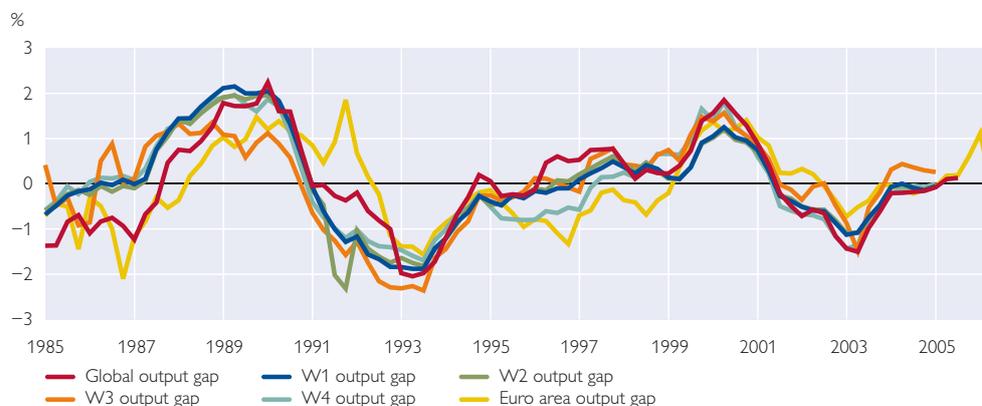
¹⁴ The euro area output gap is taken from the Area-Wide Model Database. The global output gap is a trade-weighted global output gap from the euro perspective as in Borio and Filardo (2006, p. 9). Estimations done with other measures of the global output gap as calculated by Borio and Filardo yield very similar results, confirming the robustness of our results. Global output gap data were kindly provided by Borio and Filardo.

¹⁵ Although both variables tend to be highly synchronized, replacing the euro area output gap with the global output gap yields implausible results, showing that domestic excess demand is more relevant than foreign excess demand. Estimations are available on request.

¹⁶ This variable is determined by calculating the difference between the domestic and foreign output gaps. The variable is set at zero when the difference is within a range of $\pm 1\%$.

¹⁷ In principle, we could also allow the coefficients for lagged inflation and relative import prices to vary over time, but since they are not our main interest, we assume them to be fixed. Estimates allowing for time-varying coefficients for lagged inflation and relative import prices yielded qualitatively similar results.

Chart 3

Measures of Global Output Gaps and Euro Area Output Gap


Source: OeNB, Borio and Filardo (2006).

Note: W1 to W4 are alternative measures of the global output gap as proposed and estimated in Borio and Filardo (2006).

The model used for the empirical estimation is:

$$\begin{aligned} infc = & \beta_1 * infc_{t-1} + \beta_2 * infc_{t-2} + \beta_3 * rimpinf + \\ & \beta_4 * rimpinf_{t-1} + \beta_5 * rimpinf_{t-2} + sv1 * ygd_{t-1} + \\ & sv2 * dygdygw_t \end{aligned}$$

where inflation is relative inflation above its trend ($infc$), with trend inflation being approximated by the Hodrick-Prescott filter. Relative import prices ($rimpinf$) are changes in import prices above changes in domestic inflation.¹⁸ All variables are first differences of the normalized variables. $sv1$ is the time-varying coefficient of the domestic output gap (ygd), while $sv2$ is the time-varying coefficient of the deviation above a threshold of the global from the domestic output gap ($dygdygw$).

In a first step, the model is estimated excluding the deviation of the global from the domestic output gap as a time-varying explanatory variable.

The estimation results shown in chart 4 confirm that the relationship

between inflation and domestic measures of excess demand in the euro area has indeed changed over time. While the domestic output gap contributed to explaining inflation significantly up to the early 1990s, its explanatory power declined markedly and was insignificant in the latter part of the period under review. This result is consistent with a number of studies which have found that inflation and output growth dynamics have changed globally over time (Canova et al., 2006).

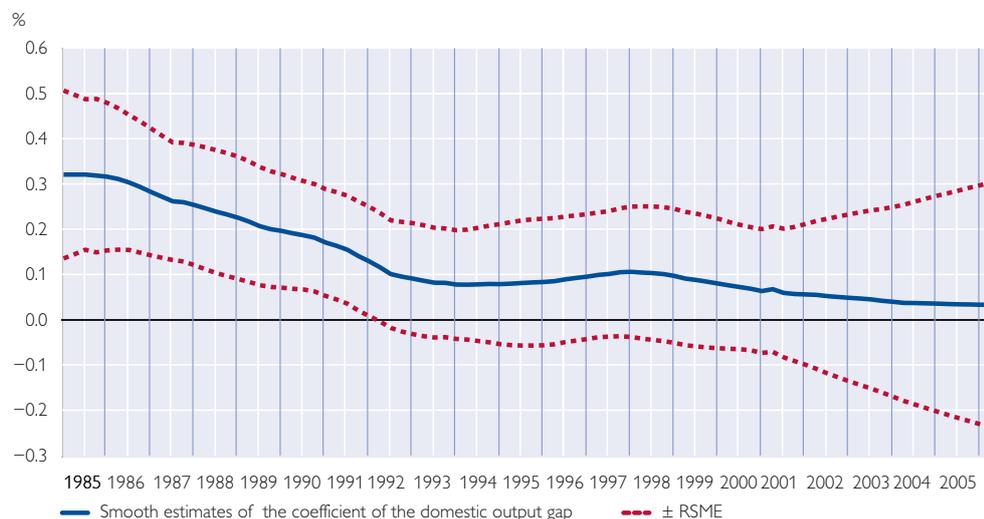
In a second step, we include also the deviation of the global from the domestic output gap as a time-varying explanatory variable.

This second estimation result, which is shown in chart 5, confirms that the effect of the domestic output gap on inflation in the euro area weakened markedly over time. By contrast, the influence of the deviation of the global from the domestic output gap increased slightly. Although the confidence bands suggest that both variables are not significant,

¹⁸ The estimations were also done using oil prices and relative oil prices as alternative measures of supply shocks. However, these variables turned out to be insignificant.

Chart 4

The Declining Importance of the Domestic Output Gap in Explaining Euro Area Inflation



Source: OeNB, authors' calculations.

Note: RSME stands for root mean square error.

the result is interesting. As chart 3 showed, domestic and foreign output gaps have tended to be more synchronized over time, which implies that the deviation of the global from the domestic output gap tends to be smaller (and less volatile) toward the end of our sample, while its effect on inflation tends to be greater.¹⁹

All in all, by 2005, both the domestic output gap as well as the deviation of the global from the domestic output gap have a quantitatively similar, small and insignificant effect on domestic inflation. These findings suggest that other factors, such as a changed monetary policy regime, changes in the formation of inflation expectations or other omitted variables, e.g. labor productivity developments, may play an increasing role in explaining the development of inflation in the euro area. Canova et al.

(2006) find that for the euro area “changes in the transmission and the volatility of monetary policy shocks and in the volatility of supply shocks matter” in explaining the changing dynamics of inflation and output growth.

How do these results compare to the few other empirical studies which directly relate inflation to a global output gap or foreign capacity constraints? Tootell (1998) investigates the effect of foreign capacity on U.S. inflation, but defines foreign capacity as the output gap of the six main trading partners (Canada, Germany, France, Italy, Japan and the U.K.). He finds that foreign capacity does not contribute to explaining the fall in inflation up to 1998 and concludes that domestic capacity is still more important, which is in part similar to our results. But he does not investi-

¹⁹ Estimations in which relative import prices are also modeled as gradually changing parameters also show that the importance of these variables diminishes over time and thus does not compensate for the falling explanatory power of the domestic output gap. Estimation results are available from the authors on request.

Chart 5a

Declining Influence of the Domestic Output Gap on Euro Area Inflation

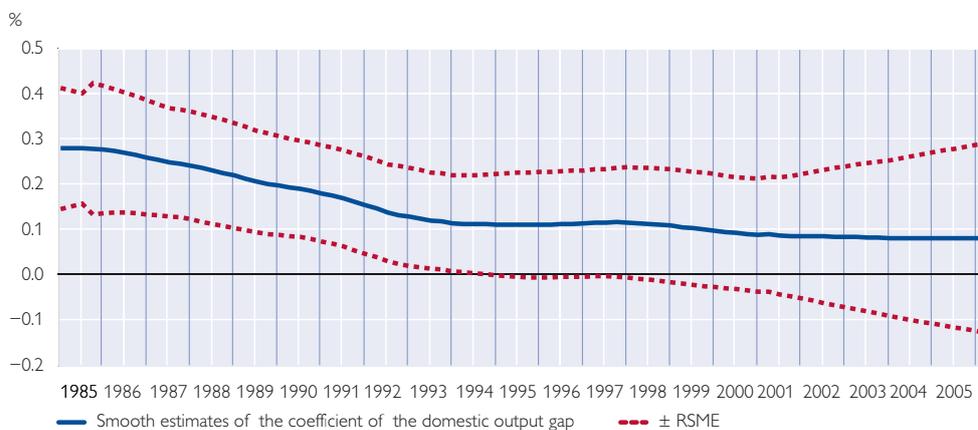
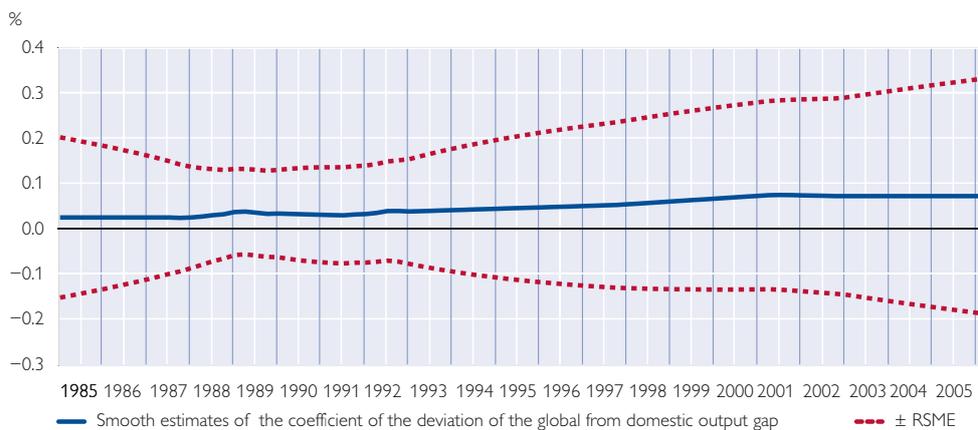


Chart 5b

Slightly Increasing Influence of the Deviation of Global from Domestic Output Gap on Euro Area Inflation



Source: OeNB.

Note: RSME stands for root mean square error.

gate whether this relationship has changed over time and misses the important recent period of accelerating globalization. Additionally, the study uses a narrow definition of main trading partners and thus does not take into account the increases in capacity utilization implied by the opening of large emerging markets such as China and India. Gamber and Hung (2001) come to quite a different conclusion, showing that including foreign capac-

ity utilization in a Phillips curve equation helps explain inflation in the U.S.A. significantly better than a specification without foreign capacity utilization. The difference between their results and those of Tootell (1998) could be due to the fact that they cover 35 U.S. trading partners, which includes many large emerging countries (i.e. China and India).

Our results can probably be compared most directly with those of

Borio and Filardo (2006).²⁰ These authors investigate the sensitivity of inflation to the domestic output gap and to different measures of foreign economic slack, after controlling for increases in input costs. Their results for a large cross-section of countries show that measures of global economic slack add considerable explanatory power to traditional benchmark inflation rate equations or in some cases that the measures of global economic slack are more highly positively correlated with domestic inflation than the domestic output gap. Qualitatively, the two studies point in the same direction in the sense that the relationship between inflation and domestic output has weakened over time. But they yield different results on the role of global capacity constraints. This reflects, on the one hand, different econometric estimation techniques. On the other hand, our estimation takes the deviation between global and domestic output gap as an explanatory variable whereas Borio and Filardo (2006) use the foreign output gap as such.

Another related paper on this subject, Mumtaz and Surico (2006), uses quite a different methodology. These authors use a dynamic factor model with time-varying coefficients and stochastic volatility to identify national and international common features on inflation in a panel of 164 series for the most industrialized economies in the world. Their results show that while a common international factor tracks the level of national inflation rates reasonably well, country specificities are more important in explaining the volatility

of actual inflation. A noteworthy result is that they find the international component of national inflation rates to have become increasingly important in the last decade, while the impact of country-specific conditions on inflation has tended to disappear in the recent past.

5 Summary and Conclusions

This study investigated two groups of channels through which globalization may have influenced inflation over recent years.

First, globalization is likely to have strengthened monetary authorities' commitment to price stability. Globalization and its consequences, such as more flexible prices and wages, a flatter short-run Phillips curve and higher net costs from unanticipated inflation in more open economies, have prompted legislators to grant central banks independence and to mandate the central banks to maintain price stability as their primary goal. Independently of and beyond the effects of stronger central bank independence, the same globalization effects can also be expected to have lowered the time-consistent inflation rate ultimately achievable under a discretionary monetary policy regime. Increased price and wage flexibility has reduced the optimal safety margin towards zero inflation. The globalization of capital flows and the associated stronger "threat of devaluation" have added to the quest for monetary policy credibility and price stability. Central banks may also have used favorable shocks (including the price-dampening effects of globalization) to "lock in" lower inflation rates

²⁰ First, our global output gap data (including the range of countries included) were kindly provided by Borio and Filardo. Second, like our study, Borio and Filardo (2006) also analyze whether the coefficients have changed over time.

than would otherwise have been easily achievable. The continued good inflation performance despite a recent series of adverse cost shocks (in particular soaring energy and raw material prices) strengthens explanations which trace lower inflation to fundamental changes in the formation of prices and inflation expectations rather than to mere “good luck.”

Second, globalization has been argued to have weakened the link between the domestic output gap and inflation, with the global output gap playing an increasing role for individual countries’ inflation developments. Since the euro area and global business cycles are broadly synchronized, “compensatory” effects among capacity constraints in the euro area and the rest of the world can be expected to be rather limited. An empirical estimation performed in this study on the one hand confirms that unlike in the 1980s, the domestic output gap no longer plays a significant role in explaining inflation in the euro area more recently. This finding coincides e.g. with Borio and Filardo (2006), who found significantly declining sensitivity of inflation to domestic measures of slack. On the other hand, we cannot confirm these authors’ result that the global output gap has replaced the domestic output gap in driving euro area inflation. We find that while the importance of the deviation of the global output gap from the domestic output gap increased slightly over the past 20 years, it has remained insignificant.

The difference between our results and those of other studies reflects various differences in variables and estimation methods used: Our study’s focus was on finding time-varying parameters, and instead of the global output gap as such, its de-

viation from the euro area’s output gap was used as an explanatory variable. The results are similar, though, in the sense that also in Borio and Filardo (2006) the global output gap plays a much smaller role in explaining domestic inflation for the euro area as a whole than for individual countries. Naturally, for the Eurosystem’s monetary policy, only aggregate euro area economic developments can ultimately be decisive. The increasing role of the global output gap for domestic inflation in many individual euro area countries may indeed also reflect increasing integration among euro area countries.

On a more structural note, the integration of global goods and (partly) factor markets has – through various channels – boosted global potential output beyond the sum of former production capabilities. As long as world demand does not rise at the same pace, this output boost should dampen world inflation. As emerging economies’ catching-up progresses, these countries’ savings investment balance might shift toward more consumption, reducing these economies’ global inflation-dampening influence. Furthermore, as recent experience has demonstrated, increased world production can create bottlenecks in raw materials and energy, and can thus also be associated with negative cost shocks, putting upward pressure on prices.

Which conclusions can we draw from the above findings?

- The empirically widely found reduced link between domestic measures of economic slack and inflation implies that cyclical fluctuations should contribute less than before to deviations of inflation from the central bank’s definition of price stability. As a cor-

ollary, however, monetary policy becomes less effective in influencing inflation through the traditional demand channel, and it becomes harder to bring inflation back to target once it deviates. The transmission of monetary policy to domestic inflation can be further loosened by increasing interlinkages among world long-term interest rates (Borio and Filardo, 2006; BIS, 2006).²¹ Stabilizing inflation expectations in the first place becomes more important in this changed economic environment.

- It is uncontroversial to state that globalization increases the need for central banks and other policymakers to monitor international developments closely. However, this should in our view be understood in a rather general sense. Particularly for a large currency area such as the euro area, it does not imply that the central bank should include some measure of global slack in its reaction function. To date, global slack conditions have a very modest and – in our estimates insignificant – explanatory power for inflation in the (aggregate) euro area. Furthermore, for practical policy purposes, it is very difficult to estimate the global output gap. In particular, measuring potential growth and output in rapidly developing emerging economies, which are experiencing signifi-

cant structural changes, is a daunting task (Borio and Filardo, 2006;²² Henry, 2006). Gearing monetary policy decisions on domestic output gap developments has been shown to be potentially seriously misleading due to difficulties in assessing output gap developments in real time (Orphanides, 2002). Focusing on global output gap developments would further exacerbate this problem.

- Globalization is on balance likely to have increased the uncertainty (determinants of the business cycle and inflation process, data uncertainty, uncertainty on monetary policy transmission) that monetary policymakers face. The changing economic environment alters conventional policy guideposts in a way that complicates policy deliberations. This calls for policy strategies based on a broad set of indicators – domestic and global – which are comparatively more robust to a changing economic environment.
- It is far from clear for how long globalization may continue to dampen global inflation developments. Changing consumption behavior in emerging economies might affect these countries' influence on the balance between global aggregate demand and supply, and thus on inflation in advanced economies in the medium run. Protectionism might put an

²¹ Related to this, the question has been raised to what extent domestic “natural rates of interest” continue to be of relevance or whether they should not increasingly be replaced by a “global natural rate of interest” to the extent that one considers such a concept a rough guidepost for monetary policy (Crespo Cuaresma et al., 2005).

²² Borio and Filardo (2006) argue, for instance, that the level of potential output in China may be a rather soft constraint, since labor supply is highly elastic and capital levels are still below those consistent with steady-state growth. At the same time, short-term labor supply bottlenecks could arise, since it takes time to move the workforce from rural areas to centers of production. Thus, they argue that the acceleration or deceleration of growth rates may be a more robust measure of short-run capacity constraints than the output gap.

end to the process of globalization and even partly reverse it. Constituencies that feel disadvantaged by globalization may increase pressure on central banks to pursue inflationary monetary policies.

– Thus, monetary policy in the euro area and other advanced currency areas cannot rely on the beneficial inflation dampening of globalization to last indefinitely.

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The New Keynesian Phillips Curve for Austria – An Extension for the Open Economy

Fabio Rumler

Following the empirical breakdown of the traditional Phillips curve relationship, the baseline New Keynesian Phillips Curve (NKPC) theory was formulated in the 1990s. Unlike the traditional Phillips curve, it derives from a theoretical model that is based on microeconomic principles. It expresses current inflation as a function of expected future inflation, past inflation and a measure of firms' marginal cost. The NKPC serves to estimate the model's structural parameters that capture price-setting behavior in an economy. This study estimates the NKPC using Austrian data. As Austria is a fairly open economy and the NKPC was initially formulated for a closed economy, the theoretical model is extended to include open-economy aspects and is then estimated in various specifications. The extended NKPC proves to explain inflation developments in Austria since 1980 quite accurately. The estimation of the structural parameters shows that around 30% of all Austrian firms change their prices every quarter, indicating that overall, prices are constant for an average of roughly ten months. Moreover, between 30% and 50% of all firms follow a backward-looking rule of thumb in setting their prices. Compared to the other euro area countries, this price duration represents an average, whereas the degree of backward-looking behavior in price setting is above average. However, the NKPC is not found to be as suitable for forecasting purposes as time-series models, as none of the inflation forecasts based on the NKPC model was able to outperform a naive forecast (unchanged inflation rate over the forecast horizon).

JEL classification: E31, C22, E12

Keywords: New Keynesian Phillips Curve, inflation dynamics, GMM, inflation forecasting.

1 Introduction

1.1 The New Keynesian Phillips Curve – Background and Derivation

The New Keynesian Phillips Curve (NKPC) is currently arguably the most commonly used inflation dynamics model in modern macroeconomics. The NKPC is derived from New Keynesian theory, whose most important assumptions are a market governed by monopolistic competition and short-term price rigidity. The baseline NKPC was developed in several contributions in the 1990s in the New-Keynesian literature¹ and represents inflation (π_t) as a function of future inflation (π_{t+1}) and firms' marginal cost (mc_t).

$$\pi_t = \gamma_f E_t(\pi_{t+1}) + \kappa(mc_t) \quad (1)$$

For empirical applications, some contributions make suitable assumptions for the labor market to proxy marginal cost with a real economic activity variable, such as the output gap.

$$\pi_t = \gamma_f E_t(\pi_{t+1}) + \lambda(y_t - y_t^*) \quad (2)$$

Hence, the only difference between the formulation of the new and the traditional Phillips curve lies in the fact that the former relies on future, rather than past, inflation to determine current inflation. However, the two concepts differ fundamentally, as the new Phillips curve is derived from a theoretical model with rational ex-

¹ For an overview of the literature, see Goodfriend and King (1997).

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pectations that is based on microeconomic principles.

The empirical evaluation of the Phillips curve shown in equation (2) undertaken in the early new-Keynesian literature was not very successful: Frequently, estimates of the output gap coefficient λ were only negative or not significant. In a seminal article, Galí and Gertler (1999) introduced two features into the NKCP that markedly improved the empirical explanatory power of the model. The authors extended the pure forward-looking model by adding past inflation as an explanatory variable in the Phillips curve equation (π_{t-1}). Further, they used real unit labor costs rather than the output gap as an empirical proxy for the (unobservable) marginal cost. The resulting formulation is generally referred to as the hybrid NKPC, as it displays features of both the traditional and the new Phillips curve:

$$\pi_t = \gamma_f E_t(\pi_{t+1}) + \gamma_b \pi_{t-1} + \kappa(mc_t) \quad (3)$$

At this point, it should be noted that the parameters of the Phillips curve equation (γ_f , γ_b , κ or λ) are represented in reduced form in equations (1) through (3). These parameters are themselves combinations of the structural parameters resulting from the underlying theoretical model. The theoretical model is based on the assumption of firms maximizing profit in a monopolistic competition market; they face a demand function with constant elasticity of demand. Firms' price-setting behavior is assumed to be subject to the restrictions formulated by Calvo (1983) on the modeling of price rigidity: Each firm is allowed to adjust its price in any given period with a certain (fixed) probability of $1-\theta$, which means that θ represents the probability of a firm not

adjusting its price in this period. In addition to Calvo price setting, Galí and Gertler (1999) assume that a certain fraction of firms, ω , sets prices according to a rule of thumb, whereas the remainder, $1-\omega$, sets prices optimally. Firms that use the rule of thumb pursue a backward-looking approach, basing their prices on the optimum price in the last period and then updating it with past inflation. After solving the maximization problem under the given assumptions, the equation for the inflation rate may now be written in its structural form:

$$\pi_t = E_t \frac{\theta\beta}{\Delta} \pi_{t+1} + \frac{\omega}{\Delta} \pi_{t-1} + \frac{(1-\theta)(1-\omega)(1-\theta\beta)}{\Delta} [mc_t] \quad (4)$$

with β as the discount factor of firms' future profits, and $\Delta = \theta + \omega[1 - \theta(1 - \beta)]$. The variables in the equation are defined as deviations from their steady state values; in other words, the equation is specified in linearized form.

The NKPC has been estimated numerous times for various countries both in its reduced form (equation (3)) and in a structural form, using empirical data. The parameters estimated in equation (4) represent the structural factors of a country's price-setting process underlying the model, with θ frequently being interpreted as the parameter of price rigidity and ω indicating the degree of intrinsic inflation persistence.

1.2 The New Keynesian Phillips Curve for Austria

The NKPC has not been estimated with Austrian data so far in the existing literature. As Austria is a fairly open economy, the extension of the Phillips curve model to include open-

economy aspects is especially relevant for Austria. In this contribution, the existing model of the hybrid NKPC is extended by the introduction of international trade as well as intermediate inputs. Thus, the model also captures the effects of import prices and the price of intermediate inputs on firms' marginal costs and ultimately inflation. The structural parameters of the model are then estimated and interpreted in various specifications, using Austrian quarterly data from 1980 to 2003. In particular, we identify the specification with the highest explanatory power for the analyzed period and compare the estimated degree of price rigidity of the closed economy specification with that of the open economy specification to establish whether they differ. Moreover, the forecasting performance of the extended NKPC for Austrian inflation from 2003 to 2006 is examined and compared with that of a naive forecast.

This study is structured as follows: Section 2 presents the extension of the NKPC model, which accounts for open-economy effects, and describes the empirical approach to estimating the model. The estimation results of the model's structural parameters along with some measures of fit for the individual specifications are presented and discussed in section 3. Section 4 contains an evaluation of the NKPC's forecasting performance, and section 5 concludes.

2 Extending the New Keynesian Phillips Curve to the Open Economy

2.1 The Model

For the sake of brevity, we refrain from deriving the extended model step by step, but discuss only the changes in the assumptions to account for an open economy and present the resulting Phillips curve. Rumler (2006) contains detailed information about the derivation of the Phillips curve for open economies.

The starting point is the hybrid NKPC known from the literature presented in equation (4).² The hybrid NKPC reflects the optimality condition of firms' price-setting in a general equilibrium model, expressing current inflation as a function of expected future inflation, past inflation and a measure of firms' marginal cost. In recent years, this function has been empirically tested for various countries in innumerable contributions; the empirical evidence has proved to be quite mixed. In a number of large industrial economies, the hybrid NKPC – which uses real unit labor cost as a proxy for marginal cost – has been able to deliver a good explanation of inflation dynamics over the past two decades.³ However, a number of other empirical studies have shown that especially in small, open economies, the standard NKPC model is not always suited to explaining inflationary developments during the past decades.⁴

² The theoretical model underlying the hybrid NKPC is described in detail in Galí and Gertler (1999) and in Galí et al. (2001).

³ See e.g. Galí and Gertler (1999) as well as Sbordone (2002) for the U.S.A., Galí et al. (2001) and McAdam and Willman (2003) for the euro area and Jondeau and Le Bihan (2005) for the large EU countries.

⁴ See Balakrishnan and López-Salido (2002), Bårdsen et al. (2004), Freystätter (2003) and Sondergaard (2003).

One reason for the low empirical explanatory power of the NKPC for some countries is that real unit labor costs are not sufficiently representative of firms' total cost. For many firms, the cost of intermediate inputs plays just as important a role and should therefore be taken into consideration in the proxy for marginal cost. However, it must be noted that a large fraction of intermediate inputs are imported, which means they are subject to different – often more dynamic – price developments than domestic intermediate inputs. Taking these considerations into account yields an empirically more relevant proxy for the marginal cost variable of the Phillips curve, which contains not just unit labor costs but also the prices of imported and domestically produced intermediate inputs.

Therefore, the NKPC model is extended by two production factors in addition to domestic labor, namely imported as well as domestic intermediate inputs. Moreover, open-economy aspects are built into the model by incorporating international trade both at the final demand and at the intermediate input level. Thus,

the model accounts for the fact that the firm-specific demand function and the marginal cost depend also on foreign variables.⁵

Maximizing future discounted profits of a representative firm assuming Calvo pricing – with the restriction that part of the price-setting firms follow a backward-looking rule of thumb – yields a hybrid NKPC (linearized) for this open-economy model.

$$\pi_t = E_t \frac{\theta\beta}{\Delta} \pi_{t+1} + \frac{\omega}{\Delta} \pi_{t-1} + \frac{(1-\theta)(1-\omega)(1-\theta\beta)}{[\varepsilon(\phi-1)+1]\Delta} [mc_t] \quad (5)$$

with θ representing the part of firms that do not adjust their prices in a given period, β the steady-state discount factor, ω the fraction of firms following the backward-looking rule of thumb, ε the elasticity of demand and $\Delta = \theta + \omega[1 - \theta(1 - \beta)]$. The main difference between the open-economy NKPC and the standard model in equation (4) is the marginal-cost expression (in square brackets), which now contains a number of additional variables:

$$mc_t = \left[\begin{aligned} & \hat{s}_{nt} - (\phi-1) \frac{\bar{s}_{m^d} + \bar{s}_{m^f}}{1 + (1-\phi)(\bar{s}_{m^d} + \bar{s}_{m^f})} \hat{y}_t + \frac{\bar{s}_{m^f}}{1 + (1-\phi)(\bar{s}_{m^d} + \bar{s}_{m^f})} (\hat{p}_t^d - \hat{p}_t^f) - \\ & \left[(1-\rho) \frac{\bar{s}_{m^d}}{\bar{s}_n + \bar{s}_{m^d} + \bar{s}_{m^f}} + \rho \frac{\bar{s}_{m^d}}{1 + (1-\phi)(\bar{s}_{m^d} + \bar{s}_{m^f})} \frac{\bar{s}_n}{\bar{s}_n + \bar{s}_{m^d} + \bar{s}_{m^f}} \right] (\hat{w}_t - \hat{p}_t^d) - \\ & \left[(1-\rho) \frac{\bar{s}_{m^f}}{\bar{s}_n + \bar{s}_{m^d} + \bar{s}_{m^f}} + \rho \frac{\bar{s}_{m^f}}{1 + (1-\phi)(\bar{s}_{m^d} + \bar{s}_{m^f})} \frac{\bar{s}_n}{\bar{s}_n + \bar{s}_{m^d} + \bar{s}_{m^f}} \right] (\hat{w}_t - \hat{p}_t^f) \end{aligned} \right] \quad (6)$$

⁵ Similar Phillips curve models that take open-economy aspects into account can be found in the contributions of Leith and Malley (2003), Batini et al. (2005), and Razin and Yuen (2002).

with, s_n , s_{m^d} and s_{m^f} representing shares of labor (n), domestic intermediate inputs (m^d) and imported intermediate inputs (m^f) in total domestic production, ρ denoting the elasticity of substitution between the input factors, and $\phi = \frac{(\varepsilon - 1)(1 + \bar{s}_{m^d} + \bar{s}_{m^f})}{\varepsilon(\bar{s}_n + \bar{s}_{m^d} + \bar{s}_{m^f})}$.

The variables, w , p^d and p^f , in turn, represent the prices of the input factors labor (wages), domestic and imported intermediate inputs. Hatted variables denote deviations from the steady state, and barred variables represent steady-state values.

Equation (6) shows that unlike in the standard model, marginal cost is not just a function of real unit labor cost, s_n , but also of the relative prices of the three production factors (1) domestic labor and domestic intermediate inputs (real wages), $w-p^d$, (2) domestic labor and imported intermediate inputs, $w-p^f$, and (3) domestic and imported intermediate inputs (the terms of trade), p^d-p^f . The weights with which the relative prices of the three production factors enter marginal cost are determined by their steady-state shares and the elasticity of substitution between them.

Hence, this general formulation of the open-economy NKPC nests the existing formulations for closed economies and for open economies exclusive of domestic intermediate inputs: if the share of domestic intermediate inputs in production is set at $s_{m^d} = 0$, we obtain the open-economy Phillips curve model of Leith and Malley (2003); if we additionally set the share of imported intermediate inputs at $s_{m^f} = 0$, the model yields the standard closed-economy specification of equation (4).

2.2 Empirical Approach

In a next step, the structural parameters of the NKPC presented in equations (5) and (6) are estimated for Austrian data from the first quarter of 1980 to the second quarter of 2003. Data from the third quarter of 2003 to the second quarter of 2006 are used to evaluate the NKPC's forecasting performance. As the estimation equation contains rational expectations (first term on the right-hand side of equation (5)), and a correlation between the error term and the regressors is therefore to be expected, an estimation method with instrumental variables should be used. Consequently, we use the generalized method of moments (GMM) approach, which is frequently used in the literature for this type of model (Galí et al., 2005). The model is estimated in three different specifications – SP1 for closed economies, SP2 for open economies without domestic intermediate inputs and SP3 for the general form – to allow conclusions about the estimated degree of price rigidity and inflation persistence to be drawn for the different model assumptions of marginal costs. Using various measures of fit, we then determine which of the three specifications can explain inflation dynamics in Austria best in the period under review.

Following the procedure used by others in the literature, the rate of change of the GDP deflator at the quarterly frequency is used as the dependent variable of the inflation rate in the regressions, real unit labor cost, s_n , is defined as the nominal total compensation to employees divided by nominal GDP, and s_{m^d} as well as s_{m^f} are the ratios of domestically

produced and imported intermediate inputs to nominal GDP.⁶ γ denotes real GDP, domestic nominal wages per employee are used for w , and the domestic GDP deflator and the import deflator are used as proxies for p^d and p^f , respectively. The data stem from the Austrian System of National Accounts (ESA 79 until 1988, ESA 95 from 1988); input/output tables available for the review period were used to separate intermediate inputs into domestic and imported shares.

3 Results

3.1 Estimation for Austria

Table 1 summarizes the estimation results of the structural parameters of equations (5) and (6) for model specifications SP1, SP2 and SP3. The columns contain the estimated coefficients for the share of firms that keep prices fixed in a given period (the Calvo probability of not changing a price), $\hat{\theta}$, for the firms' discount factor, $\hat{\beta}$, for the share of firms that follow a backward-looking rule of thumb, $\hat{\omega}$, and for the elasticity of substitution between input factors, $\hat{\rho}$.

The standard errors of the coefficient estimators are given in parentheses. The adjustment frequency of prices, $1-\hat{\theta}$, may be used to derive the implicit average duration of prices using the formula $1/(1-\hat{\theta})$. This duration, measured in months,⁷ is stated in the last column.

The Calvo probability of changing a price, θ , is frequently referred to as the NKPC's price rigidity parameter in the literature. Under specification SP1 (closed economy; standard NKPC), 68% of all Austrian firms leave their prices unchanged during a given quarter. This implies an average price duration of 9.5 months. For specification SP2 (open economy without domestic intermediate inputs), the degree of macroeconomic price rigidity is estimated at 0.45, which corresponds to an average 5.5 month price duration. The difference between the estimated degree of macroeconomic price rigidity in each specification is thus likely to be attributable to the modeling of marginal cost: The SP2 specification includes import prices as a key deter-

Table 1

Estimation of the Structural Parameters of Model Specifications SP1, SP2 and SP3 for the Extended New Keynesian Phillips Curve Model for Austria

Dependent variable: Inflation rate of the GDP deflator quarter on quarter changes

	$\hat{\theta}$	$\hat{\beta}$	$\hat{\omega}$	$\hat{\rho}$	Implied price duration in months
SP1	0.68 (0.16)	1.02 (0.12)	0.52 (0.20)	×	9.5
SP2	0.45 (0.09)	0.95 (0.08)	0.52 (0.09)	3.83 (2.07)	5.5
SP3	0.69 (0.14)	0.97 (0.06)	0.32 (0.18)	-4.07 (3.79)	9.7

Instrument variables: Rate of inflation lags 2 to 4, wage inflation lags 1 to 4, real unit labor cost lags 1 to 6, ratio of wages to import prices lags 1 to 4.

Source: Author's calculations.

Note: The estimation method is GMM. Newey-West standard errors are given in parentheses.

⁶ Unlike the parameters θ , β , ω and ρ , firms' demand elasticity, ε , cannot be estimated empirically, as it is not explicitly included in the estimation equation. The common practice in the literature is followed to obtain an empirical value for θ by calibrating demand elasticity with a value of 11, which implies a steady-state markup of 10% (Galí et al., 2001).

⁷ To give the duration in months, $1/(1-\hat{\theta})$ has to be multiplied by 3, as θ is estimated with quarterly data.

minant of marginal costs in addition to real unit labor cost. As a rule, import prices exhibit a more volatile development than the cost of domestic labor, possibly prompting firms that use a large share of imported intermediate inputs in production to adjust prices more often. Consequently, the estimation results confirm the hypothesis that the extension of the model to include open-economy aspects has a significant⁸ influence on the estimated degree of price rigidity.

Interestingly, for the general specification of the extended model SP3 (which includes both domestic and imported intermediate inputs), the price rigidity estimate of 0.69 is again slightly higher than that for SP2, but roughly of the same order as that for the SP1 closed-economy specification. The SP3 value may be higher than that for SP2 because domestic firms may have substituted domestic intermediate inputs for imported intermediate inputs (provided the production process allows for such a substitution) owing to fluctuations of the relative prices of the two input factors. Such a substitution would neutralize the impact of price fluctuations of imported intermediate inputs on marginal cost and would reduce the need of a firm to adjust its prices. Thus, the estimated degree of price rigidity of the Austrian economy dif-

fers depending on the specification of the NKPC. Now, to answer the question which of these values is most appropriate, one has to evaluate the different specifications by means of econometric measures of fit.⁹

Compared with other euro area countries, Austria exhibits an estimated degree of price rigidity that is neither especially high nor especially low: Rumler (2006) estimated the structural parameters of the extended NKPC for a total of nine euro area countries (euro area except Ireland, Luxembourg and Portugal). According to this study, Austria's values of θ place it fifth out of the nine countries. Germany displayed the highest degree of price rigidity among these countries, followed by Belgium, whereas price rigidity was estimated to be lowest in Greece and the Netherlands.

An additional comparison may be made using the results of a study on price-setting behavior in Austria in which the degree of price rigidity was estimated on the basis of micro CPI data (Baumgartner et al., 2005). The study finds that the average duration of a price spell for all products represented in the CPI is about 11 months. This value is roughly comparable to the estimated price duration of just under 10 months for SP1 and SP3, but is markedly higher than the price duration estimated for SP2. However,

⁸ A test of whether this difference in the parameter estimates of SP1 (0.68) and SP2 (0.45) is also statistically significant shows only a marginally significant difference (significance level: 15%); see Rumler (2006). However, as the two parameter values imply a difference in the average price duration of four months, the difference is at least economically significant.

⁹ The results refer to the estimation period Q1 1980 to Q2 2003. To verify the robustness of the results, the model was also estimated for the period Q1 1980 to Q2 2006. However, the fundamental revision of Austrian national accounts data in 2004, when all series were also adjusted retroactively, makes the comparison of the results problematic. Despite this revision, the results remain qualitatively unchanged for the longer estimation period. The results for θ may serve as an example: For the longer estimation period, SP3 exhibits the highest θ at 0.66, followed by SP1 at 0.64 and SP2 at 0.53. Hence, the magnitude of the coefficients and the ranks of the specifications for θ are hardly different. Overall, the additional estimation confirms that the results of table 1 are also robust for a longer estimation period and revised data.

three important differences between the two studies impair the comparison: the period reviewed (1996 to 2003 in the micro CPI survey versus 1980 to 2003 in this study), the data base (micro CPI data versus macro time series of the GDP deflator) and the method (price duration measured directly from price data versus GMM estimates from a structural model).

According to the NKCP theory, the discount factor, β , which corresponds to the reciprocal value of the steady-state real interest rate, should exhibit a value of close to but below 1.¹⁰ The estimates for SP2 and SP3 are in line with this theory. However, as the coefficients were estimated with uncertainty, values marginally higher than 1 – like for SP1 – do not represent a problem either, as long as they are not significantly higher than 1.

The parameter ω , which gives the fraction of firms that follow the backward-looking rule of thumb in setting prices, is directly linked to inflation persistence: The higher ω is, the higher is inflation persistence as measured by the GDP deflator. The estimation results show that the share of backward-looking firms in Austria comes to 30% to 50%, implying that the degree of inflation persistence in Austria is fairly high. This result is broadly confirmed in a cross-country comparison, as well as in other studies that examine inflation persistence in Austria empirically (Rumler, 2006; Cecchetti and Debelle, 2005; Gadzinski and Orlandi, 2004). Moreover, we found that the specification of a closed versus an open economy of the NKPC has no impact on ω , as the

estimation values of SP1 and SP2 are nearly the same. Only for SP3 did the estimates result in a somewhat lower ω , which nevertheless remains high in an international comparison.

The elasticity of substitution between the input factors of the production function, ρ , cannot be estimated for SP1, as this specification contains only one variable production factor (labor). In the case of SP2, ρ denotes the elasticity of substitution between labor and imported intermediate inputs. This elasticity is fairly high, posting an estimated value of 3.8, and is also statistically significant.¹¹ A negative elasticity of substitution between the production factors – albeit not statistically significant – is estimated for SP3. This result could reflect the fact that a constant elasticity of substitution between the three production factors is hard to estimate with the available data, because the actual substitution is possibly not the same between all production factors.

3.2 Identifying the Specification with the Highest Explanatory Power

An evaluation of the inflation rates implied by SP1, SP2 or SP3 may help determine which of the three specifications is best suited to characterize the Austrian inflation dynamics during the period observed. The idea of using this implied inflation rate – also called fundamental rate of inflation – to evaluate the explanatory power of the NKPC goes back to Galí and Gertler (1999). The fundamental rate of inflation is derived from the pres-

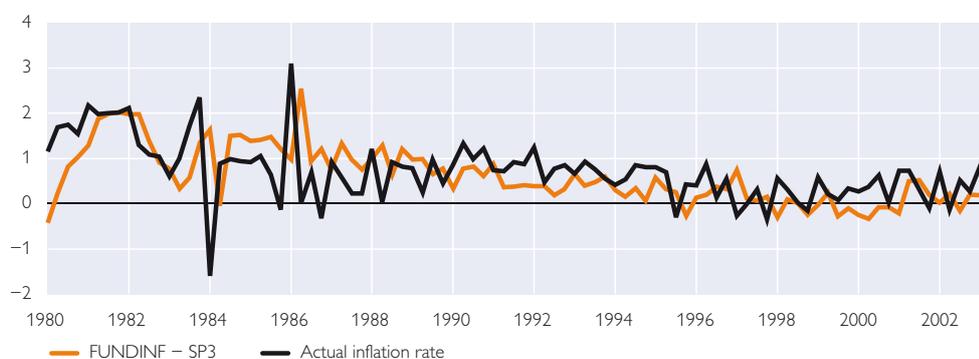
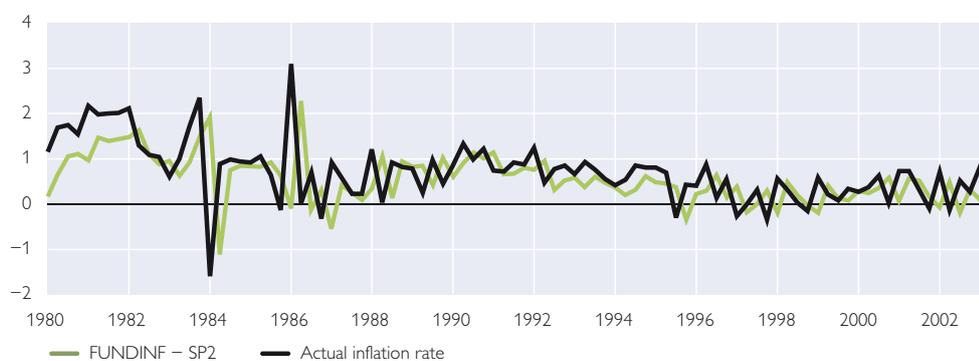
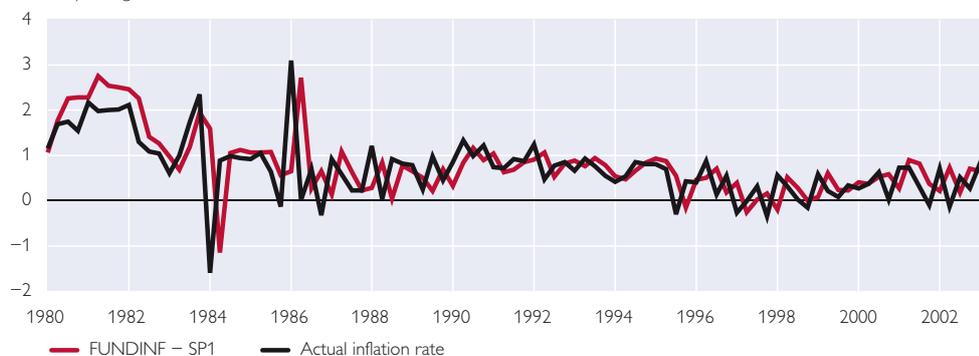
¹⁰ An estimated value of 0.99 for β would, for instance, correspond to an average real interest rate of around 1% per quarter during the estimation period.

¹¹ A value of 1 would imply a Cobb-Douglas production function.

Chart 1

**Comparison between Fundamental Rates of Inflation of SP1, SP2 and SP3
and the Actual Inflation Rate**

Quarterly change in %



Source: Author's calculations.

Table 2

**Measures of Fit of the Implied Fundamental Rate of Inflation Derived
from SP1, SP2 and SP3 and the Actual Development of Inflation**

	$\frac{StDev(\pi_t^*)}{StDev(\pi_t)}$	$Corr(\pi_t^*, \pi_t)$	$RMSD(\pi_t^*, \pi_t)$	Rank
SP1	1.03	0.49	0.69	1
SP2	0.78	0.23	0.77	3
SP3	0.93	0.32	0.76	2

Source: Author's calculations.

ent value formulation of the NKPC, which presents the inflation rate as the sum of present and all expected future marginal costs.¹²

For the evaluation, the following three common measures of fit are used to compare the fundamental rate of inflation, π_i^* , for each specification with the actual development of inflation, π_i (1) the ratio of the standard deviation of the fundamental and the actual rate of inflation, $StDev(\pi_i^*)/StDev(\pi_i)$, (2) the correlation coefficient between the fundamental and the actual rate of inflation, $Corr(\pi_i^*, \pi_i)$, and (3) the root mean squared deviation of the fundamental rate of inflation from the actual inflation rate, $RMSD(\pi_i^*, \pi_i)$.

Chart 1 compares fundamental inflation as derived from SP1, SP2 and SP3 and actual inflation developments (quarter on quarter) from 1980 to 2003. Overall, chart 1 shows that all three specifications of the NKPC explain inflation developments in Austria during the observation period fairly well. The deviations from the actual developments were somewhat more pronounced only in the first third of the observation period (until about 1987), when inflationary developments were generally slightly more volatile. Moreover, specification SP1 is found to trace actual developments best. A simple eyeball inspection of the middle (SP2) and lower (SP3) panels in chart 1 does not induce a clear preference for one or the other specification. Hence, the comparison should be based on the measures of fit defined above.

Table 2 shows the three measures of fit of the fundamental inflation rate with actual inflation and ranks the

specifications' performance resulting from the total of all three measures. The data confirm the graphic analysis that specification SP1 displays the highest explanatory power for Austrian inflation developments during the observation period: The ratio of standard deviations in the first two rows is close to the optimum value of 1, the correlation is highest with a value of just under 0.5, and the root mean squared deviation of the fundamental from the actual inflation rate is lowest among the three specifications. According to the measures of fit, specification SP3 has the second-highest explanatory power, as both the deviation from the optimum value of the ratio of standard deviations and the root mean squared deviation are smaller than in the case of SP2, and the correlation coefficient for SP3 is larger than that for SP2.

Thus, the closed-economy specification of the NKPC, SP1, exhibits the highest explanatory power for Austrian inflation developments in the period from 1980 to 2003, followed by the general open-economy specification, SP3, and the specification with only imported intermediate inputs as an additional production factor, SP2. For the estimated degree of price rigidity (table 1), this means that the value for θ estimated at just under 0.7 for both SP1 and SP3 is likely to be more accurate than the lower price rigidity estimate of 0.45 for SP2.

Moreover, the average price duration of just under 10 months derived from the higher value also corresponds better to the price duration of 11 months derived from the micro CPI data. However, this result – SP1

¹² For more detailed information on the derivation and calculation of the fundamental inflation rate, see Rumler (2006).

exhibiting the highest explanatory power – does not mean that the extension of the NKPC for Austria is irrelevant. On the one hand, the performance of SP1 proves to be only marginally better than that of SP3, and on the other hand, there is another important criterion for the performance of the NKPC, and this criterion has not yet been taken into account: the plausibility of the estimates of the reduced form model. In particular, it is relevant whether the respective marginal cost term is significant, as a problem with the identification of the structural parameters arises if it is not (Guay and Pelgrin, 2004). According to this criterion, SP3 should be preferred over SP1 and SP2, as SP3 is the only specification in which marginal cost provides a significant contribution to explaining inflation developments (Rumler, 2006).

Hence, based on these considerations, one may infer that only SP2 was misspecified for Austria, and thus the relatively low price rigidity estimate of this specification is likely to be inappropriate.

4 Inflation Forecasting Using the New Keynesian Phillips Curve

The NKPC is used as a structural model above all to explain past inflation developments, but is not generally used to forecast inflation.¹³ In this section, an attempt is made to employ the NKPC model for forecasting purposes. The starting point is the concept of the fundamental inflation rate, which is adapted to produce an inflation forecast, reporting current inflation as the sum of current and expected discounted future marginal costs. To construct a measure of fun-

damental inflation, a forecast of future marginal cost must be made on the basis of an econometric model. Galí and Gertler (1999) propose a bivariate vector autoregressive (VAR) model with the variables inflation and marginal cost for this purpose. If the forecast of future marginal cost is lagged by one period, so that a forecast of current and expected future marginal cost is provided from the perspective of the last period, this forecast may be used to construct the current fundamental inflation rate. This fundamental rate of inflation expected from the perspective of the past period is interpreted as the inflation forecast, i.e. based on information from period t a forecast of the inflation rate implied by the model is calculated for $t+1$, and iteratively for $t+2$, $t+3$ etc.

To evaluate the predictive power of the NKPC, out-of-sample forecasts were made for each of the three specifications for the period ranging from the third quarter of 2003 (end of the estimation period) up to the second quarter of 2006 (end of the sample period). Chart 2 shows these inflation forecasts and the actual inflation developments for this period, with a forecasting horizon of one quarter (left panel) and four quarters (right panel). Thus, the colored lines in the chart represent the stacked forecast values over the respective forecasting horizons.

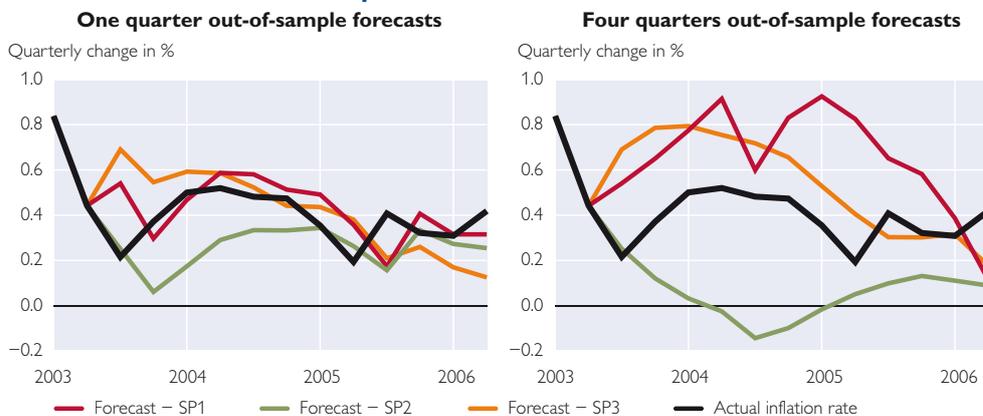
Chart 2 shows that pronounced forecasting errors are concentrated in the first half of the evaluation period for both forecasting horizons; forecasts converge – and hence display smaller forecasting errors – in the second half of the period. Forecasting errors are naturally smaller for the

¹³ In the literature no contribution was found that uses the NKPC for inflation forecasting.

Chart 2

Inflation Forecasts Based on SP1, SP2 and SP3

and Actual Inflation Developments



Source: Author's calculations.

Table 3

Root Mean Square Forecasting Error (RMSE)

**for Inflation Forecasts based on SP1, SP2 and SP3
and the Naive Forecast by Forecasting Horizon**

	RMSE	RMSE
	One quarter out-of-sample forecasts	Four quarters out-of-sample forecasts
SP1	0.14	0.35
SP2	0.18	0.38
SP3	0.20	0.25
Naive	0.13	0.21

Source: Author's calculations.

shorter horizon (left panel) than for the four-quarter horizon (right panel). Interestingly, the three specifications perform quite differently for the different forecasting horizons. According to the chart, specification SP1 appears to perform best for the short forecasting horizon, whereas specification SP3 seems to deliver the best forecast for the longer forecasting horizon.

Table 3 confirms the impression gained by the visual inspection of chart 2 that the specifications display differences in the relative forecasting performance for both forecasting horizons. We use a common measure to evaluate forecasting performance,

namely the root mean square forecasting error (RMSE) for each forecasting horizon. The last line of the table provides naive forecast (random walk forecast) figures as a benchmark to gauge the forecasting accuracy. The naive forecast assumes a flat forecasting profile of the inflation rate over the respective forecasting horizon (with the forecast equaling the last period's actual value). The naive forecast is frequently used as a benchmark in the empirical literature, as it has proved to be hard to outperform in the medium to long term for many macroeconomic variables, among them also inflation.

For the forecasting horizon of one quarter, specification SP1 has the lowest RMSE at 0.14, followed by SP2 and SP3. However, the naive forecast still performs best, with an RMSE of 0.13 for the one-quarter horizon, and it performs best for the four-quarter forecasting horizon at 0.21, compared with 0.25 for SP3 and much higher results for SP1 and SP2.

Thus, the evaluation of the forecasting quality of the NKPC demonstrates a fairly poor performance for the Phillips curve model – it cannot beat a naive forecast, neither over a short- nor over a longer-term forecasting horizon. One reason could be the relatively complex construction of the inflation forecast, which is based on a forecast of future marginal cost using a bivariate VAR model. Thus, the quality of the inflation forecast depends directly on the quality of the forecast of future marginal cost. The marginal cost forecast, in turn, is based on a very simple method whose quality cannot be verified, as the discounted sum of all future marginal costs is not observable.

Given these results, NKPC models are not suited as an alternative to econometric time-series models for inflation forecasts, especially because in the short term (up to one year), time-series models usually clearly outperform the naive forecast (Benalal et al., 2004). Hence, it may be noted that the NKPC is better suited to explain inflation developments *ex post* and to estimate the structural parameters of the price-setting process than to inflation forecasting.

5 Conclusions

The NKPC is a structural model to explain inflation dynamics. The model is helpful in estimating the

structural parameters of the price-setting process in an economy. The resulting parameter values in the estimation largely depend on the model specification used. As the NKPC was originally conceived for a closed-economy setting, it should be adapted accordingly if it is estimated for an open economy such as Austria. The NKPC model presented in this study is extended to account for open-economy effects and is additionally extended by intermediate inputs; it thus nests the standard closed-economy model as a special case.

The estimates for the parameter representing structural price rigidity differ depending on the model specification: they are higher for the closed-economy specification and for the general formulation of the extended NKPC (with both domestic and imported intermediate inputs) than for the specification that contains only imported intermediate inputs. One reason could be more frequent price adjustments by firms that do not have the option of substituting domestic intermediate inputs (with less volatile prices) for imported intermediate inputs (that are subject to stronger price fluctuations resulting e.g. from exchange rate fluctuations or volatile commodity prices).

However, on evaluating the different specifications using econometric measures of fit, we determined that SP2, which results in a lower degree of price rigidity, is likely to be misspecified. According to the measures of fit, the general formulation of the extended NKPC model and the standard closed-economy model are about equally well suited to explaining inflation developments in Austria since 1980. The estimated degree of price rigidity is also roughly equal in both specifications: They both show

that somewhat more than 30% of all firms adjust their prices in a given quarter, which means that a single firm's prices remain unchanged for an average of just under ten months. This value is neither very high nor very low by comparison to other euro area countries, and it roughly matches the average price duration derived from Austrian micro CPI data.

The estimation of the structural parameters shows that depending on the specification, 30% to 50% of all Austrian firms follow a backward-looking rule of thumb in updating their prices. This implies a fairly high degree of inflation persistence, also by international standards, which is generally confirmed by other multi-country studies on this topic. A high degree of inflation persistence has implications for economic policymaking, as pertinent studies show that it dampens the transmission of specific types of macroeconomic shocks on the inflation rate. For instance, the impact of an oil price shock on inflation is more subdued but lasts longer if inflation persistence is high. At the same time, though, a high degree of inflation persistence triggers a stronger output reaction to an oil price shock, which means that in the case of a supply shock, the inflation-output variability trade-off shifts in favor

of inflation and to the disadvantage of output (Altissimo et al., 2006).

The result of an examination of the NKPC's suitability as an inflation forecasting tool for Austria was rather disappointing. The results obtained using the NKPC fell short of those obtained with the naive forecast (the forecast equals the last period's actual value) both over the one-quarter and the four-quarter forecasting horizons. Thus, the NKPC does not appear to be useful as a forecasting alternative to the established time-series models, which perform far better over a short-term forecasting horizon of up to one year. However, it may by all means complement time-series models as a structural model in which firms' pricing is determined by their expectations of the development of their future marginal costs. Inflation forecasting using the NKPC is an indirect approach, as it is based on a forecast of future marginal cost developments. Depending on the specification, this approach indirectly accounts for labor cost developments and the price developments of domestic and imported intermediate inputs. However, this method has the disadvantage that a forecast based on such a two-stage construction does not lend itself very well to economic interpretation.

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Revised and New Competitiveness Indicators for Austria Reflect Improvement Trend since EMU Accession

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Maintaining and improving competitiveness is one key goal of economic policy. In the short run, it is primarily price and cost developments as well as exchange rate changes that have the biggest impact on the development of an economy's competitiveness. The competitiveness of Austrian manufacturing exporters has continued to augment since the country's entry into Economic and Monetary Union (EMU) – this has been confirmed by the 2006 revision of the price competitiveness indicator for Austria (deflated by the (Harmonised) Index of Consumer Prices – HICPI/CPI) and even more so by the new cost competitiveness indicator (deflated by relative unit labor costs) launched in this context. The marked improvement of the cost competitiveness indicator in recent years reflects moderate wage policies coupled with comparatively solid productivity growth in the Austrian manufacturing sector. The lower gain measured by the price competitiveness indicator may be linked to the fact that the HICPI/CPI was broadly driven by oil price developments in 2004 and 2005, which masked the favorable unit labor cost developments in the manufacturing industry. Contrary to the development in the manufacturing sector, the price competitiveness in Austria's travel and tourism sector has deteriorated somewhat: Even though price developments in Austria were more favorable than in the competition markets, they did not wholly offset losses in competitiveness related to exchange rate developments.

JEL classification: F3, F4

Keywords: effective exchange rates, price and cost competitiveness, manufacturing and service sector.

1 Competitiveness Indicators in EMU

Small, open economies need to pursue economic policies that allow them to remain competitive and to keep improving their global competitiveness. The international competitiveness of an economy is fundamentally influenced by *firm-specific factors* (such as innovative capacity, product and marketing quality, delivery reliability and customer care) and macroeconomic *location factors* (such as human capital, natural resources, public goods, labor relations and the tax system). Above all, factors such as education policies, scientific advances, research efforts and innovative capacities determine the medium- to long-term international competitiveness of an economy. In the short run, however, competitiveness burns down

to the price competitiveness of the external sector, which is driven by relative price changes reflecting the level of labor and capital costs, productivity gains or losses, and exchange rate changes.

Thus, any assessment of the short-term (price and cost) competitiveness of a country will have to start by analyzing how its exchange rates and domestic price and cost indices have changed compared with those of its trading partners. With regard to exchange rates, bilateral exchange rate shifts tend to draw the biggest media attention, but it must be noted that, in this respect, only the overall exchange rate effect is a meaningful macroeconomic indicator.

The basic aggregate indicator for such analyzes is the *nominal effective exchange rate index*. Calculated as the

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weighted average of bilateral exchange rates, this index shows how the external value of a currency moves in relation to the currencies of the country's trading partners. Deflating the nominal effective exchange rate by a measure for relative prices or costs yields the *real effective exchange rate index*.¹ Real effective exchange rate indices reflect changes in the competitiveness of producers on both home and external markets – which is why policymakers and economists consider them to be key indicators for the international price/cost competitiveness of a country. Ideally, these indices relate to those sectors of the economy that are exposed to international competition, depict trade relations as accurately as possible, and represent underlying prices/costs in a reliable and internationally comparable manner.²

In the case of the respective indices calculated by the European Central Bank (ECB), the real effective exchange rate index of the euro provides important information on how competitive the euro area is as a whole in terms of prices and costs, while the ECB's nominal effective exchange rate index tracks the euro's movements vis-à-vis the currencies of the euro area countries' major trading partners.³ As such, the nominal effective exchange rate index of the euro is an important yardstick for assessing monetary conditions in view of (expected) inflation and price developments – and thus the more important of the two measures *from the perspec-*

tive of the Eurosystem's single monetary policy.

As an aggregate price/cost competitiveness index for the euro area as a whole, the ECB's real effective exchange rate for the euro, by definition, masks differences in the price/cost competitiveness between individual euro area member states. Yet from a national perspective, such differences are, of course, a major yardstick for the growth performance of the individual member countries. The national central banks (NCBs) of the euro area therefore calculate and publish *national price/cost competitiveness indicators (i.e. national real effective exchange rate indices)*, based on a harmonized methodology adopted in 1999 when the euro was introduced.

Both the ECB's and the NCBs' indicators are revised at regular intervals, to catch up with changing external trade patterns⁴ and to avoid misjudgments of shifts in the short-term competitiveness of individual countries. In the case of Austria, the recent update of the national price competitiveness indicator in 2006 resulted in a broadening of the coverage of partner countries and in a readjustment of country weights; moreover, a new cost competitiveness indicator deflated by unit labor costs was calculated.

In what follows, section 2 presents the major changes in calculating the price competitiveness indicator, describes the new cost competitiveness indicator, and analyzes the implications of choosing unit labor costs

¹ See Köhler-Töglhofer (1999).

² In other words, these indices must cover all internationally tradable goods and – ideally – services; the reliability and international comparability of data on services is, however, limited.

³ See ECB (2000, 2002, 2003).

⁴ See Hahn et al. (2001) on the revision of 2001.

instead of the (Harmonised) Index of Consumer Prices (HICP/CPI) as deflators. Section 3 provides a competitiveness assessment based on the revised and new framework. Section 4 discusses above all the revision of the subindex for travel and tourism, Austria's flagship service industry, and reassesses the sector's competitiveness on the basis of the revised data.

2 Revised Price and New Cost Competitiveness Indicators for Austria

Since 1999, the euro area NCBs have used a harmonized methodology to calculate national competitiveness indicators. The NCBs typically revise those indicators in five-year intervals. Austria's original framework for calculating the national competitiveness indicator was already consistent with this harmonized methodology, so that the revision in 2006 altered neither the concept nor the composition of the indicator. Specifically, the below-listed characteristic building blocks of Austria's competitiveness indicator remained unchanged:⁵

- subindices for manufactured goods, food, crude materials, and travel and tourism;
- the geometrical weighting of the index (this means that a basket of bilateral exchange rates is used to calculate the geometrically weighted average, which yields the price competitiveness indicator when adjusted for relative consumer prices); and
- the fixed weighting system consisting of bilateral import weights, bilateral export weights for food and crude materials, and multilateral (double) export weights for manufactured goods and for travel and tourism.

While bilateral export weights are easy to calculate and intuitive, they neglect third-market effects, which gain importance as trade ties expand. The method of choice to catch third-market effects are double export weights. Double weights are more difficult to calculate and less intuitive (see box 1) but more comprehensive, as they reflect both home and external market competition with individual competitors (depicted in competition matrices; see annex).

Box 1

Algebraic Presentation of Double Export Weights

For k foreign markets on which a country j competes with h competitors, the weight to be allocated to country i in the effective exchange rate index of country j may be expressed algebraically as follows:

$$\text{Double export weight: } w_i^x = \left(\frac{x_j^i}{x_j} \right) \left(\frac{y_i}{y_i + \sum_h x_h^i} \right) + \sum_{k \neq i} \left(\frac{x_j^k}{x_j} \right) \left(\frac{x_i^k}{y_k + \sum_h x_h^k} \right)$$

y_j = share of domestic output in the domestic demand of country j (defined as GDP minus exports plus imports)

x_j^i = exports of country j to country i

x_j = total exports of country j

$\sum_h x_h^i$ = sum of exports from h (excluding j) to country i

⁵ See Mooslechner (1995), Köhler-Töglhofer (1999) and Hahn et al. (2001).

In the algebraic expression of the double export weight, the first parenthesis term in the first block of the equation represents the direct export competition between exports from j to i . The second parenthesis term is a measure of the openness of economy i . If i is an important market for exports from j (as expressed by $\left(\frac{x_j^i}{x_j}\right)$) and/or if i displays a relatively small degree of openness (i.e. if most manufactured goods available in i stem from domestic production – as expressed by $\left(\frac{y_i}{y_i + \sum_h x_h^i}\right)$ – and compete heavily with exports from j on market i), then i enters the currency basket of j with a higher weighting.

The second block of the equation represents competition in third markets, i.e. any market k in which i competes with j . If k is an important market for exports from j (as calculated by $\left(\frac{x_j^k}{x_j}\right)$) and/or if exports from i account for a high market share of k (as calculated by $\left(\frac{x_i^k}{y_k + \sum_h x_h^k}\right)$), this means that, from the perspective of j , i is a major competitor of j in third markets and thus is given a higher weight in the currency basket of j .¹

¹ See Klau (2006).

2.1 Austria's Competitiveness Indicator Adjusted to a Changing Global Competition Environment

2.2.1 Broader Country Coverage

To reflect changes in the pattern of Austrian exports, the *sample of partner countries* was enlarged from 53 to 62, specifically by Malta, Ukraine, Serbia and Montenegro, Bosnia and Herzegovina, Belarus, the United Arab Emirates, Saudi Arabia, Egypt and Iran. This expansion underlines the growing complexity of Austria's trade patterns in general, and the increasing importance of trade with

Southern and Southeastern European as well as Arab countries in particular.

The new indicator also uses more recent *calculation periods* to determine the fixed country weights. The country weights were rebased from 1995–1997 averages to 1999–2001 averages to reflect more recent export and import flows.⁶

The *index base period* as such has been left unchanged at the first-quarter average of 1999 (i.e. 1999 Q1 = 100), which is also the base period used in the corresponding ECB exchange rate indices. Note, how-

⁶ The country weights for the manufactured goods subindex are based on trade flows in manufactured goods as defined in SITC (Standard International Trade Classification) sections 5 to 8; for the crude materials subindex on trade flows in crude materials including fuel as defined in SITC 2 to 4; and for the food subindex on trade flows in food as defined in SITC 0 and 1. To establish double export weights, the manufactured goods subindex is also based on gross manufacturing output figures of the respective countries.

ever, that the price competitiveness index is a “chained index” for post-1993 data. That is to say, for the period up to 1999, the price competitiveness indicator remains based on the old sample of partner countries and on the 1995–1997 calculation period, which reflects Austria’s trade relations and thus Austria’s competitive situation more adequately for the period from 1993 up to 1999. For the period since 1999, the revised index is the basis for evaluations of Austria’s competitiveness.

The enlarged sample of partner countries and the shift of the calculation period have not caused the country weights to change considerably. The ranking of Austria’s major competitors has remained broadly unchanged, but their relative importance has shifted somewhat, basically as a result of the new calculation period and not so much because of the larger sample of partner countries.

The **aggregate index** continues to be characterized by a high foreign trade share (66.1%) of the old EU Member States. The slight contraction of this group (–3 percentage points compared with the previous country weighting) is largely due to the relative loss of importance of France, whereas Germany’s weight has decreased only marginally. The share of those Member States that joined the EU in 2004 was boosted to 8.5% (from 7% in the old country/currency basket). The weight of the three old EU Member States that have opted not to join the euro area has remained constant, as has Switzerland’s weight (3.5%). Japan’s weight has remained broadly unchanged at 2.5%, while that of the U.S.A. has inched up to 8%.⁷ The countries newly added to the index, finally, account for a share of about 1%.

Turning to the effects of the revision of double export weights for the

Chart 1

Chained Aggregate Index of Austria’s Price Competitiveness – Developments since 1993



Source: OeNB/WIFO.

⁷ The comparatively high weight of the U.S. dollar is also due to the fact that imports of manufactured goods, crude materials as well as food from “other countries” have been allocated to U.S. dollar trade. This approach is warranted by the dominant role of the U.S. dollar as a transaction currency in international energy and commodity markets; the bulk of Austria’s crude material imports, for instance, is invoiced in U.S. dollars.

manufactured goods subindex, we can observe only minor weight changes. Germany was the only country to suffer a marked loss (–5 percentage points), while the U.S.A., China, the Czech Republic and Hungary have been allocated slightly higher weights (table 1). The index continues to show a highly negative third-market effect for our major trading partner, Germany, as well as for Hungary and Switzerland (i.e. their direct export weights are higher than the export weights adjusted for competition in third markets).

On balance, the EU-25 account for a share of 71% (down from 73%) in the weightings established for Austria's *price competitiveness index for manufactured goods*, and the euro area for 55.6% (down from 59.1%). While

exchange rate uncertainty has disappeared within the euro area, the 55.6% must not be misinterpreted as the share of Austrian exports that is no longer exposed to any exchange rate risks.⁸

The 13 EU Member States that do not participate in the euro area have a combined weight of 15.4% (up from 14.3%); within this group, Denmark, the United Kingdom and Sweden still represent a broadly constant weight of 7.7%. The weight of Switzerland has declined slightly to 3.6%, while that of the U.S.A. has increased from close to 6% to 7.5%. Japan's weight has remained virtually unchanged at 3.2%, but the weight of Asia excluding Japan has risen by 1 percentage point to 7.2%. China's weight, finally, comes to 2%.

⁸ As the double export weights account for the competition between, for example, Austrian and German exports both in the German market and in all other EMU and non-EMU markets, exchange rate changes of the euro to non-EMU currencies matter for Austrian and German exporters alike.

REVISED AND NEW COMPETITIVENESS INDICATORS FOR AUSTRIA
REFLECT IMPROVEMENT TREND SINCE EMU ACCESSION

Table 1

Weighting Scheme of the New Exchange Rate Index																		
	Exports						Imports						Exports and imports					
	Manu- factured goods ¹	Crude mate- rials	Food	Goods	Travel ¹	Total	Manu- factured goods ¹	Crude mate- rials	Food	Goods	Travel ¹	Total	Manu- factured goods ¹	Crude mate- rials	Food	Goods	Travel ¹	Total
France	6.86	1.54	2.43	6.38	6.13	6.34	4.87	0.85	5.81	4.52	2.60	4.32	5.86	1.06	4.30	5.42	4.73	5.34
Belgium	2.70	0.89	1.27	2.55	1.36	2.36	2.02	0.97	2.18	1.92	1.99	1.93	2.36	0.94	1.78	2.22	1.61	2.15
Luxembourg	0.24	0.05	0.03	0.22	0.21	0.22	0.17	0.00	0.04	0.14	0.16	0.14	0.20	0.02	0.03	0.18	0.19	0.18
Netherlands	2.41	1.44	3.02	2.39	4.47	2.71	2.78	3.56	6.43	3.06	1.35	2.88	2.59	2.89	4.91	2.74	3.24	2.80
Germany	28.75	28.02	35.13	29.02	35.74	30.06	42.77	27.42	41.07	41.14	25.25	39.48	35.78	27.61	38.42	35.30	31.58	34.72
Italy	8.79	29.43	21.21	10.40	9.40	10.25	7.43	3.56	12.37	7.32	16.33	8.25	8.11	11.68	16.31	8.80	12.15	9.26
Ireland	0.94	0.03	0.18	0.86	0.39	0.78	0.97	0.08	0.43	0.85	0.49	0.81	0.95	0.07	0.32	0.85	0.43	0.80
Portugal	0.58	0.16	0.26	0.54	0.77	0.58	0.54	0.16	0.10	0.47	0.38	0.47	0.56	0.16	0.17	0.51	0.62	0.52
Spain	3.06	0.51	1.59	2.86	6.70	3.46	1.35	0.62	4.04	1.42	3.44	1.63	2.20	0.58	2.95	2.12	5.41	2.56
Finland	0.90	0.32	0.40	0.85	0.23	0.75	1.17	0.45	0.15	1.04	0.17	0.95	1.04	0.41	0.26	0.95	0.21	0.85
Greece	0.33	0.46	0.93	0.36	1.33	0.52	0.14	0.13	0.84	0.18	3.19	0.49	0.23	0.23	0.88	0.27	2.07	0.50
Cyprus	0.01	0.01	0.24	0.02	0.31	0.07	0.00	0.00	0.09	0.01	0.27	0.04	0.01	0.00	0.16	0.02	0.29	0.05
Czech Republic	2.16	5.97	2.28	2.35	0.99	2.14	2.33	5.78	0.78	2.59	2.50	2.58	2.24	5.84	1.45	2.47	1.59	2.36
Denmark	0.79	0.08	0.46	0.74	1.35	0.83	0.60	0.33	1.04	0.60	0.32	0.57	0.70	0.25	0.78	0.67	0.94	0.70
Estonia	0.06	0.02	0.09	0.06	0.00	0.05	0.03	0.02	0.01	0.03	0.00	0.02	0.04	0.02	0.05	0.04	0.00	0.04
Hungary	2.38	3.31	1.62	2.39	0.76	2.13	3.29	4.69	3.09	3.42	4.48	3.53	2.83	4.25	2.43	2.92	2.23	2.82
Latvia	0.03	0.01	0.11	0.03	0.00	0.03	0.02	0.03	0.01	0.02	0.00	0.02	0.03	0.03	0.05	0.03	0.00	0.03
Lithuania	0.06	0.02	0.10	0.06	0.00	0.05	0.04	0.05	0.07	0.04	0.00	0.04	0.05	0.04	0.08	0.05	0.00	0.04
Malta	0.03	0.04	0.09	0.03	0.00	0.02	0.01	0.00	0.00	0.01	0.00	0.01	0.02	0.01	0.04	0.02	0.00	0.02
Poland	1.70	0.68	1.27	1.63	0.86	1.51	0.84	2.65	1.18	1.04	0.46	0.98	1.27	2.03	1.22	1.32	0.70	1.25
Sweden	1.54	0.17	1.46	1.47	0.90	1.38	1.45	1.52	0.28	1.39	0.39	1.29	1.50	1.10	0.81	1.43	0.70	1.34
Slovenia	0.60	3.39	2.55	0.83	0.23	0.74	1.06	0.42	0.16	0.94	1.66	1.02	0.83	1.35	1.23	0.89	0.79	0.88
Slovakia	0.70	2.20	0.96	0.79	0.18	0.69	1.16	3.39	0.24	1.33	0.92	1.29	0.93	3.02	0.56	1.07	0.48	0.99
United Kingdom	5.35	2.81	5.00	5.21	6.10	5.35	3.06	1.40	1.46	2.81	8.17	3.37	4.20	1.84	3.04	3.96	6.92	4.37
Australia	0.38	0.08	0.12	0.35	0.75	0.41	0.04	0.09	0.19	0.05	0.46	0.10	0.21	0.08	0.16	0.20	0.63	0.26
Canada	0.76	0.08	0.11	0.69	1.05	0.75	0.55	0.67	0.14	0.54	2.18	0.71	0.66	0.48	0.12	0.61	1.50	0.73
Japan	3.16	4.38	1.11	3.12	0.61	2.73	2.92	0.14	0.05	2.48	0.29	2.25	3.04	1.47	0.52	2.79	0.48	2.50
Norway	0.42	0.06	0.16	0.39	0.00	0.33	0.15	0.75	0.07	0.20	0.00	0.18	0.28	0.54	0.11	0.29	0.00	0.26
Switzerland	3.59	5.57	3.86	3.70	4.18	3.77	3.35	2.14	2.41	3.17	4.09	3.27	3.47	3.22	3.06	3.43	4.14	3.52
U.S.A.	7.49	1.72	2.37	6.96	11.78	7.71	6.86	15.81	6.75	7.75	13.76	8.38	7.17	11.39	4.80	7.37	12.56	8.04
South Korea	1.01	0.39	0.19	0.94	0.00	0.80	0.55	0.01	0.01	0.47	0.00	0.42	0.78	0.13	0.09	0.70	0.00	0.61
Hong Kong	0.12	0.35	0.05	0.13	0.00	0.11	0.42	0.00	0.02	0.36	0.00	0.32	0.27	0.11	0.03	0.25	0.00	0.21
Singapore	0.56	0.01	0.09	0.51	0.00	0.43	0.21	0.00	0.01	0.18	0.00	0.16	0.38	0.01	0.05	0.34	0.00	0.30
New Zealand	0.06	0.00	0.17	0.06	0.00	0.05	0.01	0.02	0.48	0.03	0.00	0.03	0.03	0.01	0.34	0.05	0.00	0.04
Algeria	0.05	0.13	0.03	0.05	0.00	0.04	0.00	1.98	0.00	0.20	0.00	0.18	0.02	1.40	0.02	0.13	0.00	0.11
Argentina	0.14	0.03	0.02	0.13	0.00	0.11	0.01	0.02	0.39	0.03	0.00	0.03	0.07	0.02	0.23	0.08	0.00	0.07
Brazil	0.57	0.14	0.30	0.54	0.00	0.45	0.11	0.69	1.71	0.26	0.00	0.23	0.34	0.52	1.08	0.39	0.00	0.34
Bulgaria	0.19	0.11	0.31	0.19	0.00	0.16	0.12	0.12	0.20	0.12	0.00	0.11	0.15	0.12	0.25	0.16	0.00	0.14
China	2.04	0.53	0.01	1.87	0.00	1.58	1.83	0.40	0.37	1.60	0.00	1.44	1.93	0.44	0.21	1.73	0.00	1.51
Croatia	0.58	1.15	1.80	0.67	0.63	0.66	0.39	0.42	0.23	0.38	1.87	0.54	0.48	0.65	0.93	0.52	1.12	0.60
India	0.40	0.03	0.01	0.37	0.00	0.31	0.25	0.03	0.27	0.23	0.00	0.21	0.33	0.03	0.15	0.30	0.00	0.26
Indonesia	0.35	0.18	0.03	0.32	0.00	0.27	0.19	0.21	0.26	0.20	0.00	0.18	0.27	0.20	0.15	0.26	0.00	0.22
Israel	0.28	0.14	0.15	0.26	0.00	0.22	0.15	0.09	0.26	0.15	0.00	0.14	0.21	0.11	0.21	0.00	0.18	
Malaysia	0.42	0.02	0.01	0.38	0.00	0.32	0.49	0.19	0.03	0.43	0.00	0.39	0.45	0.14	0.02	0.41	0.00	0.35
Mexico	0.43	0.03	0.06	0.39	0.00	0.33	0.18	0.05	0.10	0.16	0.00	0.14	0.30	0.04	0.08	0.27	0.00	0.24
Morocco	0.07	0.03	0.05	0.06	0.00	0.05	0.07	0.13	0.10	0.08	0.00	0.07	0.07	0.10	0.08	0.07	0.00	0.06
Philippines	0.22	0.00	0.02	0.20	0.00	0.17	0.09	0.02	0.06	0.08	0.00	0.07	0.15	0.01	0.04	0.14	0.00	0.12
Romania	0.57	0.23	1.21	0.58	0.00	0.49	0.48	0.45	0.21	0.46	0.00	0.41	0.52	0.38	0.66	0.52	0.00	0.45
Russian Federation	1.18	0.40	1.39	1.15	0.27	1.01	0.29	11.51	0.07	1.40	0.35	1.29	0.73	8.03	0.66	1.28	0.30	1.15
South Africa	0.46	0.04	0.38	0.43	0.00	0.37	0.08	1.90	0.59	0.29	0.00	0.26	0.27	1.32	0.50	0.36	0.00	0.31
Taiwan	0.89	0.31	0.08	0.82	0.00	0.70	1.00	0.01	0.01	0.84	0.00	0.75	0.94	0.10	0.04	0.83	0.00	0.73
Thailand	0.32	0.04	0.02	0.29	0.40	0.31	0.27	0.09	0.39	0.26	0.34	0.27	0.30	0.07	0.23	0.28	0.38	0.29
Turkey	0.86	0.95	0.20	0.83	1.43	0.92	0.56	0.45	2.02	0.63	1.70	0.74	0.71	0.61	1.21	0.73	1.54	0.83
Iceland	0.03	0.00	0.03	0.02	0.00	0.02	0.02	0.02	0.01	0.02	0.00	0.02	0.02	0.02	0.02	0.02	0.00	0.02
Ukraine	0.35	0.13	0.20	0.33	0.00	0.28	0.15	1.67	0.20	0.30	0.00	0.27	0.25	1.19	0.20	0.32	0.00	0.28
Serbia and Montenegro	0.24	0.29	0.75	0.27	0.00	0.23	0.03	0.06	0.25	0.05	0.00	0.04	0.14	0.13	0.47	0.15	0.00	0.14
Bosnia and Herzegovina	0.09	0.13	1.32	0.15	0.00	0.12	0.03	0.22	0.02	0.05	0.00	0.05	0.06	0.19	0.60	0.10	0.00	0.09
Belarus	0.10	0.00	0.03	0.09	0.00	0.08	0.03	0.02	0.03	0.02	0.00	0.02	0.06	0.02	0.03	0.06	0.00	0.05
Iran	0.32	0.05	0.04	0.29	0.00	0.25	0.02	0.05	0.13	0.03	0.00	0.03	0.17	0.05	0.09	0.16	0.00	0.14
United Arab Emirates	0.11	0.02	0.24	0.11	0.00	0.09	0.01	0.01	0.00	0.01	0.00	0.01	0.06	0.01	0.11	0.06	0.00	0.05
Saudi Arabia	0.15	0.60	0.38	0.18	0.00	0.15	0.01	1.43	0.00	0.15	0.00	0.14	0.08	1.17	0.17	0.17	0.00	0.15
Egypt	0.11	0.11	0.05	0.11	0.51	0.17	0.02	0.06	0.08	0.03	0.43	0.07	0.07	0.07	0.07	0.47	0.00	0.12
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: OeNB/WIFO.

¹ Double weights.

Box 2

How the Weighting Patterns of the OeNB/WIFO and the ECB Price Competitiveness Indices Differ

The ECB started publishing nominal effective and real effective exchange rate indices for the euro in 1999, using the euro area's aggregate exports and imports of manufactured goods (SITC 5 to 8) as a basis for calculation. The nominal effective exchange rate of the euro tracks the development of the euro's international value, i.e. depicts how the euro moves in relation to the other currencies covered by the index. The real effective exchange rate mirrors the price and cost competitiveness of the euro area as a whole compared with non-euro area trading partners. The respective index weights are calculated on the basis of the euro area's overall external trade with non-euro area countries, excluding any intra-euro area trade (intra-EU-12).

Of course, the extent to which bilateral exchange rate changes of the euro affect the real economies of the euro area countries differs across the euro area, depending on the extent of national trade flows to and from non-euro area countries. Thus, parity changes between the euro and the U.S. dollar will hit Germany more strongly than Austria, because Germany trades more heavily with the U.S.A. Austria's competitiveness, in turn, is influenced more strongly than that of the other euro area countries by parity changes of the euro against the currencies of Central, Eastern and Southeastern European countries.

In the case of Austria, the exclusion of intra-EU-12 trade from calculations of the euro's effective exchange rate indices implies that close to 56% of Austria's manufactured goods exports do not enter the calculation. Yet even as a member of the European Economic and Monetary Union (EMU), Austrian producers face price and cost competition on the respective domestic markets and on third markets (i.e. any intra- and extra-euro area markets in which Austrian exports compete with exports from other euro area countries).

Hence, the individual EMU participants quite obviously continue to analyze the development of national price and cost competitiveness on the basis of comprehensive national foreign trade matrices, which reflect both cross-border trade with individual euro area members and with other relevant non-euro area countries. Such an analysis is crucial for estimating how bilateral exchange rate changes of the euro affect the national economies of the euro area countries, i.e. their national export, production and employment developments. Unlike the exchange rate indices of the euro, these national competitiveness indicators hold little importance for monetary policymaking, but they are important indicators for income and structural policies, which have been kept under the responsibility of national governments, and for the analysis of macroeconomic performance differences between individual EMU members.

Before the beginning of Stage Three of EMU in 1999, the nominal and effective exchange rates for the Austrian schilling were calculated by the Austrian Institute of Economic Research (WIFO). Since January 1999, the OeNB in cooperation with WIFO has calculated an indicator of the price competitiveness of the Austrian economy, comparing price developments in Austria (as measured by the HICP) with those of its trading partners within and beyond the euro area. In 2007 the ECB will start to publish a set of harmonized price competitiveness indicators for the individual euro area countries; these indicators are in fact real effective exchange rate indices from the perspective of the individual euro area members. While the methodologies used by the OeNB/WIFO and the ECB to calculate the indicators are basically identical, the OeNB/WIFO price competitiveness indicator for Austria nonetheless differs somewhat from the ECB measure, given national specifics:

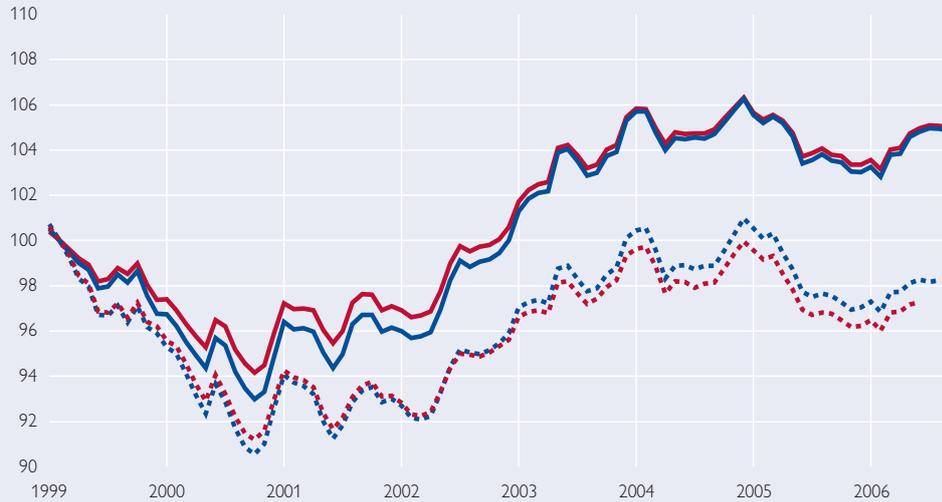
- The sample of 62 trading partners or 52 currencies in the OeNB/WIFO indicator compares with 56 trading partners or 46 currencies covered by the ECB indicator. The latter does not include Ukraine, Serbia and Montenegro, Bosnia and Herzegovina, Belarus, Iran, the United Arab Emirates, Saudi Arabia and Egypt, while the OeNB/WIFO index excludes Chile and Venezuela.
- The OeNB/WIFO indicator is a summary competitiveness indicator composed of four subindices, whereas the ECB indicator corresponds to the “manufactured goods” subindex of the OeNB/WIFO indicator. Specifically, the country (currency) weights of the ECB indicator are based on cross-border trade in manufactured goods (SITC 5 to 8), whereas the OeNB/WIFO indicator also includes the subindices travel and tourism, crude materials (SITC 2 to 4) and food (SITC 0 to 1).
- Both the OeNB/WIFO and the ECB base their indicators and their country weights on the weighted average of simple import weights and double (multilateral) export weights. As shown in box 1, it takes complex competition matrices which also track any goods purchased on the domestic market that were manufactured domestically and thus compete with imports from other countries to establish the double export weights. The competition matrix for manufactured goods underlying the OeNB/WIFO indicator is based on **gross manufacturing output**, while the ECB uses **net manufacturing output** (gross manufacturing output less intermediate consumption by manufacturing). It should be noted that the OeNB considers only gross manufacturing output to be consistent with the foreign trade statistics derived from gross flows. Moreover, intermediate consumption is not negligible for the competitiveness development. All other calculation steps are the same for both indicators.
- Finally, the OeNB/WIFO calculations are based on the UN Commodity Trade Statistics Database, while the ECB’s weights for the EU Member States are derived from Eurostat’s COMEXT database.

Chart 2

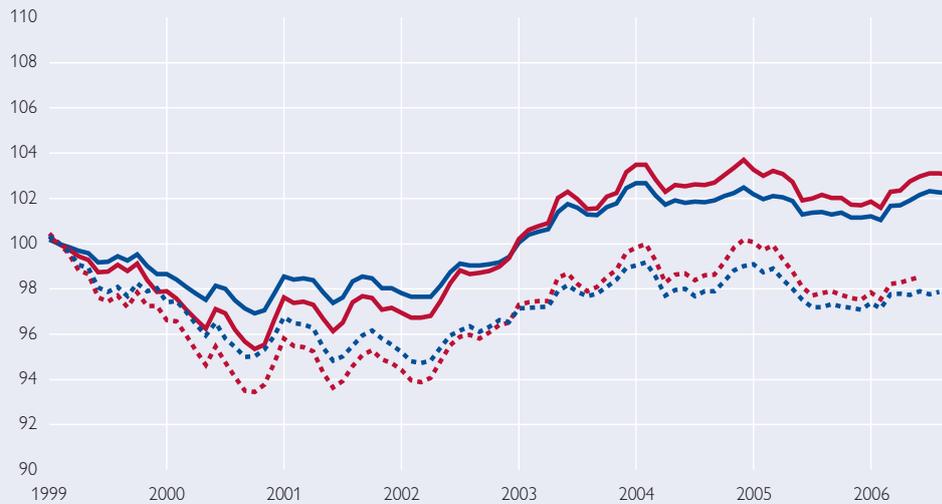
Comparison of OeNB/WIFO Indicators with ECB Indicators

1st quarter 1999 = 100

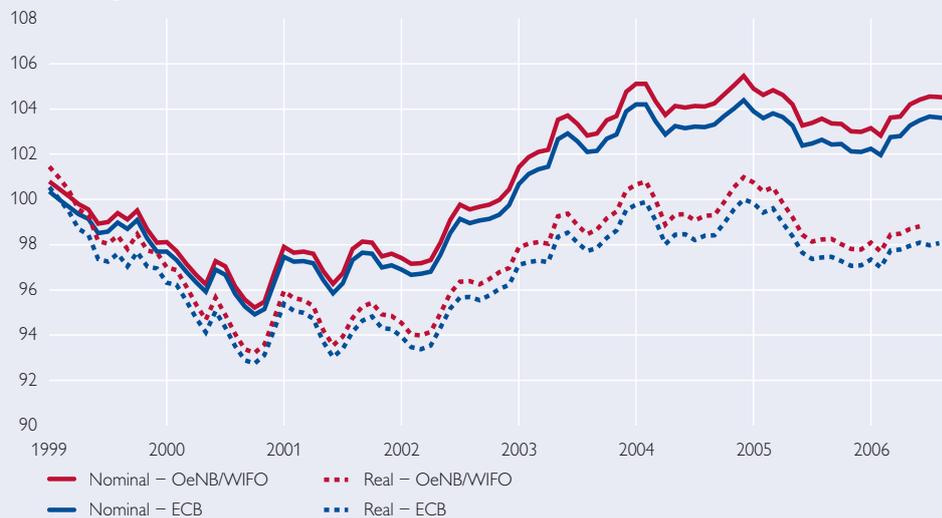
Manufactured goods exports



Manufactured goods imports



Manufactured goods, total



— Nominal – OeNB/WIFO ···· Real – OeNB/WIFO
— Nominal – ECB ···· Real – ECB

Source: ECB, OeNB/WIFO.

Table 2

Weighting Scheme of the ECB and the OeNB/WIFO Indicator						
%	ECB			OeNB/WIFO		
	Manufactured goods					
	Exports	Imports	Total	Exports	Imports	Total
France	6.13	7.83	4.42	6.86	4.87	5.86
Belgium	2.92	3.24	2.59	2.70	2.02	2.36
Luxembourg	0.22	0.23	0.21	0.24	0.17	0.20
Netherlands	4.30	4.16	4.45	2.41	2.78	2.59
Germany	34.34	22.34	46.40	28.75	42.77	35.78
Italy	7.50	8.01	6.99	8.79	7.43	8.11
Ireland	0.85	1.05	0.64	0.94	0.97	0.95
Portugal	0.46	0.66	0.25	0.58	0.54	0.56
Spain	2.02	2.99	1.03	3.06	1.35	2.20
Finland	0.96	0.88	1.04	0.90	1.17	1.04
Greece	0.26	0.41	0.11	0.33	0.14	0.23
Cyprus	0.01	0.02	0.00	0.01	0.00	0.01
Czech Republic	2.11	1.95	2.28	2.16	2.33	2.24
Denmark	0.80	1.01	0.58	0.79	0.60	0.70
Estonia	0.04	0.06	0.02	0.06	0.03	0.04
Hungary	3.54	2.56	4.52	2.38	3.29	2.83
Latvia	0.03	0.05	0.02	0.03	0.02	0.03
Lithuania	0.05	0.08	0.03	0.06	0.04	0.05
Malta	0.02	0.04	0.01	0.03	0.01	0.02
Poland	1.22	1.70	0.74	1.70	0.84	1.27
Sweden	1.43	1.50	1.37	1.54	1.45	1.50
Slovenia	1.18	0.91	1.45	0.60	1.06	0.83
Slovakia	0.95	0.75	1.16	0.70	1.16	0.93
United Kingdom	4.43	6.13	2.71	5.35	3.06	4.20
Australia	0.21	0.39	0.04	0.38	0.04	0.21
Canada	0.67	0.84	0.49	0.76	0.55	0.66
Japan	2.77	3.85	1.68	3.16	2.92	3.04
Norway	0.28	0.47	0.09	0.42	0.15	0.28
Switzerland	3.97	3.36	4.59	3.59	3.35	3.47
U.S.A.	6.42	8.14	4.68	7.49	6.86	7.17
South Korea	0.85	1.27	0.42	1.01	0.55	0.78
Hong Kong	0.79	1.29	0.29	0.12	0.42	0.27
Singapore	0.43	0.76	0.09	0.56	0.21	0.38
New Zealand	0.03	0.06	0.00	0.06	0.01	0.03
Algeria	0.03	0.06	0.00	0.05	0.00	0.02
Argentina	0.08	0.15	0.00	0.14	0.01	0.07
Brazil	0.32	0.56	0.09	0.57	0.11	0.34
Bulgaria	0.16	0.20	0.11	0.19	0.12	0.15
China	1.79	2.34	1.24	2.04	1.83	1.93
Croatia	0.53	0.64	0.43	0.58	0.39	0.48
India	0.32	0.49	0.15	0.40	0.25	0.33
Indonesia	0.21	0.33	0.08	0.35	0.19	0.27
Israel	0.25	0.36	0.13	0.28	0.15	0.21
Malaysia	0.28	0.44	0.13	0.42	0.49	0.45
Mexico	0.33	0.53	0.12	0.43	0.18	0.30
Morocco	0.06	0.08	0.03	0.07	0.07	0.07
Philippines	0.15	0.24	0.06	0.22	0.09	0.15
Romania	0.53	0.55	0.51	0.57	0.48	0.52
Russian Federation	0.63	1.11	0.15	1.18	0.29	0.73
South Africa	0.24	0.43	0.04	0.46	0.08	0.27
Taiwan	0.83	0.98	0.67	0.89	1.00	0.94
Thailand	0.30	0.42	0.18	0.32	0.27	0.30
Turkey	0.68	0.88	0.47	0.86	0.56	0.71
Iceland	0.02	0.03	0.00	0.03	0.02	0.02
Chile	0.06	0.10	0.01	x	x	x
Venezuela	0.04	0.07	0.00	x	x	x
Ukraine	x	x	x	0.35	0.15	0.25
Serbia and Montenegro	x	x	x	0.24	0.03	0.14
Bosnia and Herzegovina	x	x	x	0.09	0.03	0.06
Belarus	x	x	x	0.10	0.03	0.06
Iran	x	x	x	0.32	0.02	0.17
United Arab Emirates	x	x	x	0.11	0.01	0.06
Saudi Arabia	x	x	x	0.15	0.01	0.08
Egypt	x	x	x	0.11	0.02	0.07
Total	100.00	100.00	100.00	100.00	100.00	100.00

Source: ECB, OeNB/WIFO.

2.1.2 A New Analysis Tool:

A Competitiveness Indicator Based on Unit Labor Costs

The OeNB/WIFO used to deflate the nominal effective exchange rate index with the HICP/CPI to establish the national *price competitiveness* indicator. Using the HICP/CPI as a deflator is in fact the most widespread method of calculating real exchange rate indices. The key advantages of this method are the *timely availability* and the *international comparability* of data, given that they are derived from standardized baskets of goods reflecting average living standards. Moreover, a HICP/CPI-deflated measure reflects not only changes in labor costs, but also changes in all other cost and price elements.

Yet this method also comes with crucial disadvantages. First, the goods basket underlying consumer price indices contains large amounts of non-tradable goods, which makes those indices an imperfect proxy for changes in tradable goods.⁹ Second, consumer price indices may be “misleading indicators of the prices of traded goods” (Lafrance et al., 1998) as the exposed and protected sectors of an economy tend to have different productivity patterns. Third, HICP/CPI-deflated measures do not reflect the development of the prices of capital goods, which account for a large share of foreign trade. Fourth, import prices have a significant influence on the development of the HICP/CPI. Finally, the meaningfulness of the indicator may be distorted by indirect taxes on goods that are reimbursed upon export (unless goods are acquired directly by foreign households) and by export subsidies.

To provide a more robust assessment of the competitiveness of Austrian manufacturers in the future, the OeNB and WIFO have introduced an additional competitiveness indicator for manufactured goods based on unit labor costs in the manufacturing sector. In other words, a *cost competitiveness* indicator now complements the *price competitiveness* indicator. The two indicators differ not only with regard to the deflator but also with regard to the sample of partner countries. This sample is comparatively narrower for the cost competitiveness indicator, as comparable data on unit labor cost developments are available only for the members of the Organisation for Economic Co-operation and Development (OECD). Therefore, the sample consists of only 24 countries (OECD excluding Denmark, Luxembourg, Portugal, Slovakia and Turkey). Those countries cover 85% of all relevant exports, however.

Unlike price indicators, *cost indicators* such as labor costs also reflect any short-term deterioration which businesses absorb through pricing-to-market behavior that cuts into their margins. That said, even an indicator deflated with labor costs has some shortcomings. For instance, by definition, it reflects only the labor part of total costs – and the share of unit labor costs in aggregate manufacturing output actually decreases as an industry’s capital intensity grows. Furthermore, it neglects any labor costs contained indirectly in intermediate goods of other domestic and foreign industries. Yet such indirect labor costs do affect the export competitiveness of the manufacturing in-

⁹ In the Austrian HICP, nontradable goods and services have a weight of approximately 50%.

dustry, as do capital costs and the prices of imported crude materials.¹⁰ Moreover, high labor costs do not dampen the international competitiveness of an economy as long as they are compensated by productivity advantages.

Against this backdrop, it makes sense to use *unit labor costs* – rather than labor costs – as a deflator. Unit labor costs reflect not only changes in labor costs but also changes in labor productivity, as they are calculated by dividing the (hourly) compensation per employee by the (hourly) real value added per person employed in the manufacturing industry. As such, they are a key determinant of manufactured goods prices and thus a key indicator of the short-term competitiveness of an economy. Yet unit labor costs also create methodological problems for a number of reasons: First, labor productivity grows in boom phases but drops during economic downturns¹¹; in other words, labor productivity is sensitive to the cycle.¹² Second, the transition from labor-intensive to capital-intensive production methods reduces the meaningfulness of the cost competitiveness indicator. If labor productivity grows because capital was substituted for labor and if declining unit labor costs go hand in hand with rising capital unit costs, the cost competitiveness indicator overstates com-

petitiveness gains. A third methodological problem consists in the fact that productivity growth as such is endogenous and that strong productivity gains need not necessarily imply an improvement in competitiveness, but may also imply existing competitiveness problems.¹³

3 Austria's Competitiveness Has Improved Significantly since EMU Accession

The *cost competitiveness index*, calculated back to the beginning of 1999 and based on the first quarter of 1999 (i.e. 1999Q1 = 100), shows more volatile movements than the price competitiveness index and exhibits significant competitiveness gains for Austrian manufacturing exporters since 1999. The new index uses labor cost and productivity developments as determinants of relative unit labor cost developments and compares them with developments for Austria's trading partners.

Manufacturing unit labor costs in fact started to grow at a considerably slower pace in Austria than in its trading partner countries in the 1990s. Austrian industrial productivity had risen at an above-average rate in recent decades. It is likely to have benefited above all from the stronger internationalization of markets and from the rapid globalization of production in the wake of the European

¹⁰ However, a macroeconomic analysis shows that, measured in terms of aggregate domestic value added (or national income), labor costs are the single biggest cost determinant (accounting for just under 60% of costs) and one of the key location factors for investors.

¹¹ Productivity decreases during sharp economic setbacks or recessions. As a case in point, a quarterly analysis of productivity data for Austria shows three successive quarters of declining productivity in 2002.

¹² Consequently, unit labor costs will rise during economic downturns and drop during economic upswings. Therefore, an adequate assessment of changes in cost competitiveness would require these changes to be adjusted for cyclical components.

¹³ When excessive wage increases make jobs unprofitable, staff layoffs or business closures cause jobs – typically those with the highest unit labor costs – to be destroyed. As a consequence, productivity will rise and unit labor costs will decline.

integration process and the fall of the Iron Curtain. The productivity rises were bolstered by a contraction in employment (especially through early retirement) and by the outsourcing of services. Austria's manufacturing industry boomed above all in the second half of the 1990s, reporting average annual growth rates of 5.4% (Guger, 2006). Since early 2000 productivity growth rates have, however, slowed markedly.

Given only moderate wage pressures, manufacturing unit labor costs thus sank by 3.5% per annum on average in the second half of the 1990s.¹⁴ As a consequence of the comparatively low productivity growth since early 2000, the decline in unit labor costs has also slowed down since. In the current decade the annual average decline totaled only 1.9%, adding up to -9.3% until the end of 2005. This compares with euro area average increases of 1.2% per annum and 6.2% on a cumulative basis. Within the euro area, unit labor costs were pushed up above all by Italy (+3.1% per annum and +16.6% cumulatively), Spain (+1.8% per annum and +9.5% cumulatively), Greece (+3.2% per annum and +17.1% cumulatively) and the Netherlands (+1.7% per annum and +8.9% cumulatively). In contrast, Germany, Austria's biggest trading partner, reported a strong decline of -1.3% per annum and -6.5% on a cumulative basis.¹⁵ Poland (-4.9% per annum and -22.1% cumulatively), Sweden (-1.0% per annum and -5.1% cumulatively) and Japan (-2.2% per annum and -10.7% cumulatively) also recorded favorable

unit labor cost developments, as measured in national currencies. Among the countries that joined the EU in 2004, especially Hungary reported comparatively high annual (+3.3%) and cumulative (+17.5%) unit labor cost growth rates. Switzerland, finally, also suffered competitiveness losses through a marked rise in unit labor costs.

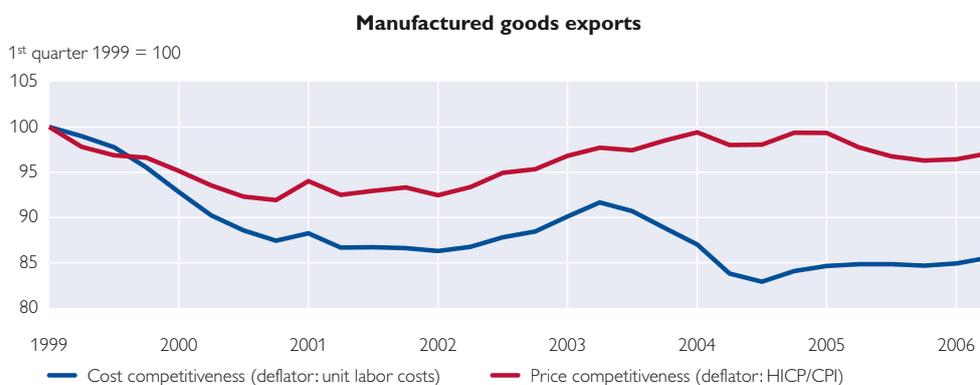
Measured by the *cost competitiveness* indicator, the international competitiveness of Austrian manufacturers' exports improved by about 15% between the beginning of 1999 and the end of 2005. This improvement can be fully ascribed to the more favorable development of unit labor costs in Austria than in its trading partner countries, whereas on balance the influence of exchange rate changes was insignificant over this period. However, a breakdown shows that short intervals within this period did show exchange rate effects. Domestic exporters benefited from the low exchange rate of the euro above all from early 1999 to end-2000, but they lost those exchange rate advantages between the beginning of 2001 and the end of 2005.

Austria's manufacturing industry posted the biggest gains in cost competitiveness from early 1999 to early 2002 and from mid-2003 to the fall of 2004. While about 40% of the cost-based gains during the first phase can be traced to favorable exchange rate changes, cost-based gains were virtually fully attributable to sinking unit labor costs during the second phase. Between 2003 and 2004,

¹⁴ See Guger (2006).

¹⁵ The single currency has made productivity and wage differences among individual euro area countries much more transparent. In terms of wage policies, EMU poses problems above all for those countries that have rigid wage-setting mechanisms.

Development of Austria's Price and Cost Competitiveness since 1999



Austrian manufacturers reported a productivity gain of close to 7% coupled with extremely moderate wage growth (about 2% nominal wage growth according to the negotiated standard wage rate index for the manufacturing sector). By comparison, the losses in cost competitiveness recorded from 2002 to mid-2003 broadly reflected exchange rate changes, whereas the losses suffered since the second half of 2004 are basically the result of unit labor cost increases.

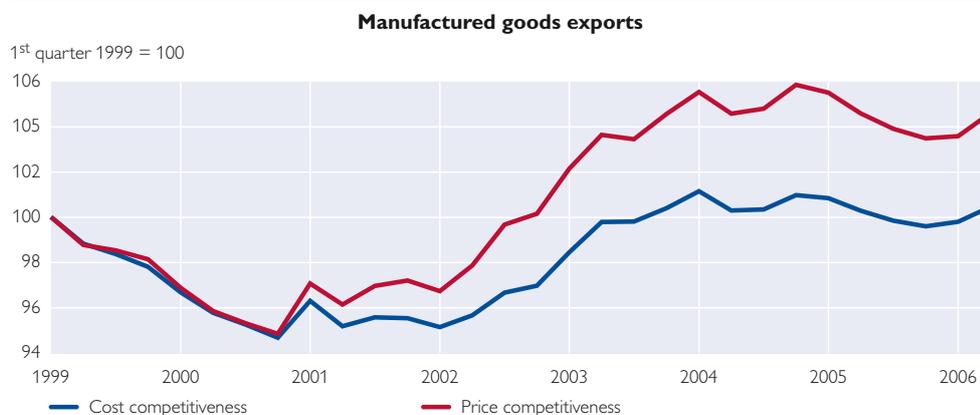
Initially, i.e. between early 1999 and early 2002, the *price competitiveness* index (relating to exports of manufactured goods) mirrors the trend of the cost competitiveness index, but in a less pronounced manner. The price competitiveness gains in this period totaled about 8%, about half of which were attributable to exchange rate gains.

In the second quarter of 2003, however, the two real effective indices started to display divergent trends. Using the HICP/CPI as a deflator, the price competitiveness indicator shows neither the marked gains up to the

second half of 2004 nor the subsequent losses revealed by the cost competitiveness indicator. To some extent, this may be explained by the fact that the HICP/CPI was broadly driven by oil price developments in 2004 and 2005 and that the favorable unit labor cost developments in the manufacturing industry do not show up in this calculation. However, the divergence between the two indicators since the second quarter of 2003 also reflects the different weighting structures used, which put the nominal effective exchange rate indices underlying the two indices on diverging paths. From the beginning of 1999 to the end of 2000, the two nominal effective exchange rates moved broadly in sync, given the low euro exchange rate. The subsequent strong depreciation of the Japanese yen and the U.S. dollar against the euro dampened both the price and the cost competitiveness of Austrian manufacturing exports. Yet the comparatively faster increase since early 2001 of the nominal effective exchange rate index underlying the price competitiveness indicator can be largely ascribed to the

Chart 4

Development of Nominal Effective Exchange Rate Indices for Austria



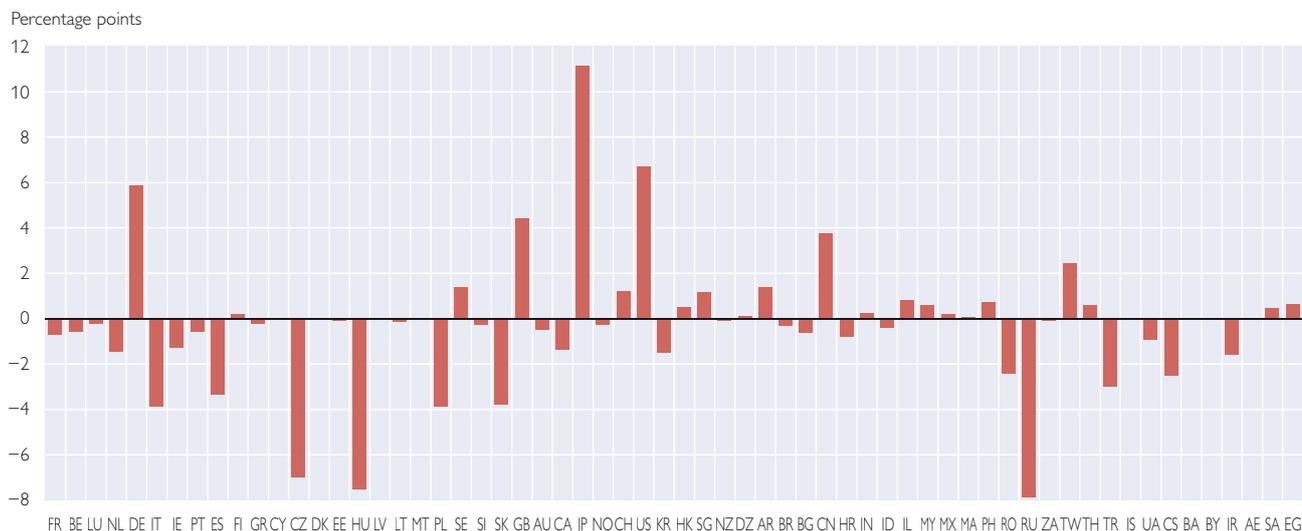
euro's exchange rate changes against the currencies of the EU candidate countries (i.e. Bulgaria,¹⁶ Romania,¹⁶ Croatia and Turkey), Asian countries (excluding Japan) and "other countries." Indeed, since the end of 2000, the euro has appreciated by as much as 85% in nominal terms against the currencies of the EU candidate countries, which have a combined weight of 2%, while the euro appreciated by about 40% against the other two country groups in the same period.

The *contributions to growth* reveal that from early 1999 to mid-2006, Austrian manufacturing exporters outperformed above all their competitors from the Russian Federation, Hungary and the Czech Republic, but also from Italy, Spain, Poland, Slovakia and Turkey in terms of price competitiveness. At the same time, Austrian exporters suffered price competitiveness losses especially vis-à-vis Japan and the U.S.A. as well as against Germany, the United Kingdom and Canada. Within the euro area, gains

and losses generally resulted from divergent price developments, whereas both price and exchange rate changes played a role in cross-border trade beyond the euro area. Austria's competitiveness losses against the U.S.A., for instance, reflect the depreciation of the U.S. dollar against the euro rather than price developments, which were more moderate in Austria than in the U.S.A. Austria's losses against Japan, in contrast, were due to both exchange rate changes and price developments. Conversely, Austria's competitiveness gains against Poland, the Czech Republic and Slovakia also reflect both exchange rate and price developments. Hungary is a case in point for divergent price developments alone driving Austrian manufacturing exporters' gains in price competitiveness. The weakening currencies of Turkey and the Russian Federation, finally, could only partly offset extremely strong price increases.

¹⁶ Bulgaria and Romania joined the EU on January 1, 2007.

**Growth Contributions to Changes in the Price Competitiveness of Austrian Manufacturing Exports
(January 1999 to June 2006)**



Source: OeNB/WIFO.

4 Austria’s Competitiveness is Increasingly Shaped by Services

Manufacturing and international trade in goods have traditionally formed the basis for the calculation of exchange rate indices or national price competitiveness indicators. This approach, however, is yielding too narrow a measure of macroeconomic competitiveness – especially in developed economies where the service sector plays a growing role. In Austria, for instance, this sector accounts for more than two-thirds of nominal gross value added (2005), comprising 80% of Austrian enterprises and 61% of dependently employed persons according to the 2004 structural business statistics. In 2005, the share of services in Austria’s foreign trade augmented to 44% of the goods transactions, while the share of services in world trade came to 24%.

Service sector competitiveness has thus become a highly relevant aspect of an economy’s total competi-

tiveness. In Austria – unlike in other countries – this aspect has been accounted for over many years in the calculation of competitiveness indicators: They include subindices for travel and tourism, mainly because (international) tourism has always been of key significance for the Austrian economy. In terms of travel and tourism exports, the country ranks first among the EU-15 (5% of nominal GDP), followed by Portugal (4.5%) and Spain (4.2%). The direct and indirect value added effects of travel and tourism come to just under 9% of GDP (Smeral, 2006). Long-term structural developments, such as the opening up of Eastern Europe or the increasing attractiveness of long-distance travel, are a big challenge for the Austrian tourism industry, however.

The data problems involved in adequately capturing the service sector in competitiveness indicators are much bigger than those in the goods sector. The calculation of the new

indices is based on a weighting according to tourism revenues rather than the number of overnight stays to

depict Austria's international competitive situation in tourism more accurately.¹⁷

Box 3

Methodological Revision of the Travel and Tourism

Indices' Weighting Structure

In the calculation of the travel and tourism indices, the formerly used weighting of target and home countries was merely an imperfect approximation of the economically relevant revenue and expenditure weighting, a method chosen for lack of data. While the data are still incomplete, the current revision attempts to create a competition matrix based on travel and tourism revenues for as large a group of countries as possible. Regional balance of payments statistics (Eurostat) and central bank data on tourism were used as primary data sources.

Estimates based on home country data as well as overnight stay statistics and data on average expenditure per overnight stay were used to close the remaining data gaps. To ensure consistency, the estimation results were cross-checked with country totals (where available) of travel and tourism revenues and expenditures.

Finally, the revised indices also account for the (highly relevant) competitive situation of domestic and outbound tourism by explicitly including domestic tourism. The data on domestic tourists' expenditure were based on national accounts data (tourism satellite account¹), complemented by estimates on the basis of overnight stay statistics.

The result is a comprehensive competition matrix for travel and tourism with 30 partner countries, which covers all countries with a share of at least 0.25% of Austria's travel and tourism (including Finland and Luxembourg) as reported in the Austrian balance of payments. The high plausibility of its results confirms that this competition matrix substantially improves the tools available for assessing price competitiveness in Austria's tourism industry despite all remaining data problems.

¹ For details on the methodology used to compile the Austrian tourism satellite account, see Smeral et al. (2002).

4.1 Austrian Tourism is Concentrated on the EU-25

The revised competition matrix (and the derived weighting structure of the travel and tourism indices) did not in fact yield unexpected results, but it did correct several misperceptions. Unsurprisingly, Germany accounts for the bulk of Austria's travel and tourism exports (35.7%), followed by the U.S.A. (11.8%) and Italy (9.4%). Spain, France and the United Kingdom have shares between 6% and 7%; the French share – which had been too high on the basis of overnight statistics – was revised down-

ward. As regards travel and tourism imports, Germany also ranks first (25.3%), followed by Italy (16.3%), the U.S.A. (13.8%) and the United Kingdom (8.2%). Please note that the indices also cover business trips, which are characterized by a shorter average duration and higher expenditure per person and overnight stay. They play a rather important role in Austrian travel and tourism imports, for instance from Germany.

Euro area countries account for 66.7% and the EU-25 for 78.4% of Austrian travel and tourism exports. For travel and tourism imports, the

¹⁷ See box 3 for a description of the methodology used.

share of euro area countries is markedly lower at 55.3%, but this is almost offset by the larger proportion of imports from non-EMU EU countries (19.2%), so that the share of the EU-25 amounts to 74.5%. The large import value seems to be attributable to higher expenditure by Austrian tourists traveling to destinations like the United Kingdom or Scandinavia and to the substantial share of business trips to Central and Eastern Europe. Countries like Hungary (4.5%), the Czech Republic (2.5%) or Slovenia (1.7%) account for significant proportions of Austrians' travel expenditure; the Hungarian share now even surpasses that of Switzerland (4.1%). By contrast, the Central and Eastern European countries account for less than 1% of Austria's travel and tourism exports (i.e. revenues), whereas Switzerland's share amounts to 4.2%; thus, the country has a roughly equal weight in Austria's travel and tourism exports and imports.¹⁸ According to the available data, the weight of Russia in Austria's tourism industry is still rather low at 0.3%. Here, too, Austria's travel and tourism imports are slightly higher than its exports. In general, the new weighting structure indicates that, especially for travel and tourism exports, changes in price competitiveness are primarily driven by relative price developments and not so much by exchange rate fluctuations.

Moreover, the new competition matrix reveals interesting structural differences between the competitive situation of domestic tourism and that

of outbound tourism. While the share of domestic tourism¹⁹ comes to 94% in the U.S.A., it is below 10% in Luxembourg. In large countries, such as France (74.9%), Italy (71.6%) or Germany (62.1%), domestic tourism is generally more significant than in small countries. Apart from country size – and various culture-dependent preferences – the income level is also an important determinant of tourism patterns. This is substantiated by the relatively large share of domestic tourism in most Central and Eastern European countries (Poland 89.1%, the Czech Republic 70.2%, Hungary 67.8%), with the exception of Slovenia (9.3%). Slovakia has an intermediate position at 55.5%, which may be attributable to its geographical proximity to the greater Vienna area.

4.2 Austria's Price Competitiveness in Travel and Tourism on a Downtrend since 2000

Owing to the new methodology used to compile the travel and tourism index, comparability with old index data is limited. Therefore, we concentrated on tracing the development of price competitiveness. It seems that the past decade was characterized by substantial changes: While the impact of exchange rate changes on competitiveness was very limited between 1995 and 2000, a nominal loss of competitiveness of around 7% was recorded from 2000 to mid-2006 – primarily owing to the strong appreciation of the euro against the U.S. dollar. As expected, the bulk of this loss was offset by more favorable

¹⁸ All in all, Austria's travel and tourism exports (EUR 12.4 billion) far exceed the country's imports (EUR 8.9 billion) in 2005.

¹⁹ See the figure reported for each country in the competitiveness matrix (main diagonal of table 4 in the annex).

price developments in Austria than in the competition markets.²⁰ All in all, the real effective loss in the competitiveness of Austria's travel and tourism industry came to 2.7% in this period, which breaks down to a loss of 3.1% for exports and 2% for imports.

The size of this loss in competitiveness seems rather small for a six-year period. However, this development differs remarkably from that observed in the period from 1995 to 2000, when the price competitiveness of Austrian travel and tourism improved by no less than 15%, with imports (19%) again posting better results than exports (12%). This gain in price competitiveness was primarily attributable to more favorable price developments (by more than 10 percentage points on average) than in the competition markets. It was also supported by nominal effective depreciations of those currencies that were later replaced by the euro; these depreciations were mainly linked to the appreciation of the U.S. dollar. The price advantages for the period from 2000 to mid-2006 were less than half this size.

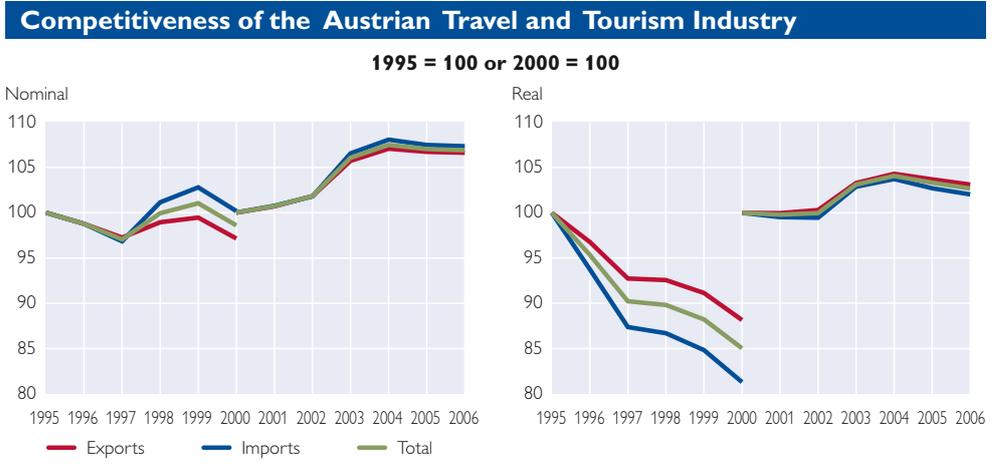
A breakdown by competition markets shows that the improvement in Austria's competitive position in travel and tourism exports between

1995 and 2000 was mainly vis-à-vis the U.S.A. (5.3 percentage points), the United Kingdom (2.2 percentage points), Italy (1.8 percentage point) and, to a lesser extent, also vis-à-vis Turkey, Spain, France and Greece. In the period from 2000 to mid-2006, the loss in competitiveness was chiefly vis-à-vis the U.S.A. (2.8 percentage points), the United Kingdom (0.9 percentage point) and Germany (0.5 percentage point). At the same time, the competitiveness of Austria's tourism sector improved slightly vis-à-vis Spain, Italy and Turkey.

The methodological revision of the weighting structure used in the travel and tourism indices was an important step to gain a clearer understanding of developments in this sector. The travel and tourism industry plays a significant role in a competitiveness assessment for the Austrian economy – after all, its contribution to Austria's GDP is especially large by international standards. One important challenge for the immediate future is to capture not just travel and tourism, but the entire service sector in the price and cost competitiveness indicators, given the steady shift toward service-based economies and the growing international tradability of services.

²⁰ Due to a lack of more specific data, these calculations are based on the difference between HICP and CPI inflation rates, not on travel cost data.

Chart 6



Source: OeNB/WIFO.

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REVISED AND NEW COMPETITIVENESS INDICATORS FOR AUSTRIA
REFLECT IMPROVEMENT TREND SINCE EMU ACCESSION

Annex

Table 3

Competition Matrix for the National Exchange Rate Index for Manufactured Goods – Part 1

Market share in %

Competition markets	Target markets															
	France	Belgium	Luxembourg	Netherlands	Germany	Italy	Ireland	Portugal	Spain	Finland	Greece	Cyprus	Czech Republic	Denmark	Estonia	Hungary
France	63.07	9.86	6.22	5.16	4.03	3.67	3.73	6.00	8.01	1.95	4.47	3.71	3.45	3.77	1.38	3.94
Belgium	4.07	25.86	12.97	9.02	2.79	1.59	2.09	2.22	2.06	1.29	2.29	1.31	1.54	2.68	0.83	2.54
Luxembourg	0.24	0.53	57.08	0.18	0.18	0.08	0.09	0.09	0.07	0.08	0.06	0.03	0.11	0.10	0.02	0.09
Netherlands	1.95	7.72	1.23	15.62	2.78	1.29	1.69	1.79	1.51	1.80	1.98	1.27	1.67	3.99	1.22	1.85
Germany	8.59	15.61	9.83	14.79	63.12	6.35	5.02	8.82	7.22	7.81	8.24	6.47	23.85	15.24	6.09	23.90
Italy	4.38	3.98	1.90	3.19	3.60	73.67	2.37	5.39	4.54	1.56	9.89	6.08	3.30	3.55	2.06	6.55
Ireland	0.74	2.28	0.22	1.95	0.92	0.47	30.57	0.34	0.54	0.48	0.52	0.36	0.54	1.03	0.42	0.51
Portugal	0.46	0.79	0.09	0.44	0.49	0.17	0.21	48.94	1.24	0.13	0.22	0.28	0.08	0.58	0.07	0.28
Spain	2.95	1.64	0.70	1.59	1.26	1.46	1.18	14.53	63.23	0.49	2.36	2.40	1.00	1.20	0.35	1.34
Finland	0.29	0.57	0.17	0.81	0.51	0.28	0.38	0.40	0.33	63.13	0.74	0.24	0.50	1.91	19.67	0.85
Greece	0.04	0.04	0.01	0.08	0.10	0.08	0.05	0.07	0.05	0.02	48.19	7.33	0.05	0.13	0.03	0.09
Cyprus	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.06	28.08	0.00	0.01	0.00	0.00
Czech Republic	0.19	0.43	0.26	0.38	1.21	0.19	0.34	0.19	0.16	0.17	0.23	0.19	47.51	0.34	0.58	1.32
Denmark	0.24	0.35	0.43	0.74	0.68	0.14	1.06	0.24	0.23	1.29	0.44	0.65	0.29	36.13	1.41	0.34
Estonia	0.00	0.02	0.00	0.04	0.02	0.00	0.01	0.01	0.00	1.21	0.00	0.04	0.01	0.18	39.69	0.06
Hungary	0.22	0.53	0.05	0.71	1.06	0.25	0.47	0.26	0.15	0.16	0.17	0.16	0.79	0.26	0.25	35.34
Latvia	0.00	0.01	0.00	0.02	0.03	0.00	0.02	0.00	0.00	0.04	0.00	0.01	0.02	0.19	1.32	0.01
Lithuania	0.02	0.03	0.00	0.05	0.04	0.01	0.02	0.01	0.02	0.06	0.00	0.04	0.03	0.35	0.86	0.02
Malta	0.04	0.04	0.00	0.01	0.03	0.01	0.01	0.00	0.00	0.02	0.00	0.02	0.01	0.01	0.01	0.03
Poland	0.23	0.53	0.13	0.70	1.06	0.31	0.11	0.27	0.15	0.22	0.23	0.75	1.93	1.31	1.17	1.58
Sweden	0.57	1.73	0.13	1.75	0.71	0.44	0.74	0.64	0.62	5.13	1.08	1.06	0.93	7.15	6.97	0.90
Slovenia	0.09	0.07	0.03	0.08	0.27	0.20	0.02	0.02	0.03	0.03	0.06	0.06	0.34	0.17	0.07	0.44
Slovakia	0.08	0.15	0.15	0.16	0.33	0.18	0.02	0.03	0.04	0.07	0.09	0.10	3.19	0.10	0.07	1.16
United Kingdom	3.27	7.61	1.32	8.20	2.90	1.96	26.46	3.14	3.11	2.65	3.23	6.14	2.91	6.14	1.60	2.45
Australia	0.02	0.09	0.00	0.13	0.04	0.03	0.12	0.02	0.04	0.02	0.12	0.09	0.01	0.08	0.00	0.01
Canada	0.13	0.47	0.33	0.36	0.12	0.07	0.33	0.05	0.08	0.16	0.23	0.12	0.08	0.53	0.04	0.08
Japan	1.04	3.05	1.26	6.35	1.89	0.94	2.79	1.35	1.02	1.68	2.15	6.91	0.51	1.46	0.79	2.17
Norway	0.13	0.19	0.16	0.41	0.21	0.08	0.39	0.21	0.13	0.61	0.30	0.61	0.07	1.80	0.58	0.07
Switzerland	1.11	0.92	0.82	1.30	1.88	1.09	0.61	0.87	0.78	0.67	1.23	0.80	1.04	1.29	0.32	1.18
U.S.A.	2.72	6.66	3.43	8.74	2.64	1.38	10.50	1.33	1.47	1.80	2.23	2.02	1.22	2.57	0.67	1.40
South Korea	0.26	0.54	0.04	1.31	0.49	0.34	0.92	0.53	0.49	0.69	2.74	4.83	0.17	0.78	0.25	0.56
Hong Kong	0.05	0.04	0.00	0.29	0.11	0.02	0.08	0.01	0.04	0.11	0.04	0.04	0.00	0.23	0.01	0.04
Singapore	0.30	0.43	0.05	2.07	0.41	0.07	2.44	0.05	0.13	0.38	0.08	0.60	0.05	0.21	0.15	0.49
New Zealand	0.00	0.00	0.00	0.01	0.01	0.02	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.03	0.02	0.00
Algeria	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.00
Argentina	0.02	0.04	0.00	0.07	0.02	0.03	0.00	0.03	0.05	0.01	0.01	0.01	0.00	0.00	0.01	0.01
Brazil	0.10	0.40	0.25	0.40	0.11	0.19	0.20	0.34	0.11	0.03	0.15	0.06	0.02	0.07	0.04	0.12
Bulgaria	0.03	0.15	0.01	0.04	0.04	0.10	0.01	0.02	0.03	0.01	0.67	0.19	0.03	0.04	0.02	0.06
China	0.52	1.33	0.23	3.17	0.93	0.58	0.60	0.39	0.64	1.01	1.21	2.30	0.84	1.54	2.01	2.45
Croatia	0.02	0.02	0.00	0.02	0.07	0.13	0.05	0.01	0.01	0.00	0.11	0.59	0.05	0.02	0.01	0.08
India	0.13	0.83	0.03	0.33	0.18	0.19	0.14	0.20	0.17	0.08	0.16	0.52	0.08	0.33	0.07	0.11
Indonesia	0.09	0.44	0.01	0.50	0.12	0.09	0.08	0.06	0.12	0.09	0.19	0.32	0.03	0.22	0.01	0.09
Israel	0.10	0.97	0.02	0.36	0.14	0.13	0.44	0.10	0.14	0.07	0.34	3.97	0.09	0.12	0.07	0.19
Malaysia	0.12	0.47	0.02	1.91	0.22	0.07	0.85	0.06	0.09	0.18	0.15	0.17	0.14	0.20	0.11	0.36
Mexico	0.05	0.12	0.05	0.22	0.18	0.03	0.20	0.08	0.07	0.01	0.01	0.03	0.02	0.05	0.01	0.30
Morocco	0.32	0.09	0.00	0.04	0.03	0.04	0.04	0.05	0.17	0.00	0.01	0.01	0.00	0.01	0.00	0.00
Philippines	0.04	0.08	0.00	1.50	0.14	0.02	0.25	0.02	0.02	0.03	0.02	0.02	0.01	0.04	0.00	0.22
Romania	0.11	0.11	0.00	0.15	0.17	0.41	0.06	0.03	0.04	0.00	0.51	0.29	0.04	0.05	0.01	0.76
Russian Federation	0.04	0.19	0.09	1.17	0.19	0.11	0.11	0.04	0.04	1.94	0.67	1.76	0.47	0.20	6.99	1.07
South Africa	0.05	0.39	0.01	0.26	0.15	0.09	0.08	0.03	0.07	0.01	0.09	0.06	0.02	0.03	0.00	0.01
Taiwan	0.34	0.41	0.20	1.61	0.58	0.25	1.42	0.15	0.28	0.36	0.38	0.81	0.51	0.68	0.52	1.12
Thailand	0.11	0.68	0.04	0.92	0.13	0.11	0.34	0.18	0.14	0.14	0.30	0.82	0.06	0.34	0.03	0.36
Turkey	0.24	0.33	0.00	0.37	0.52	0.27	0.26	0.33	0.21	0.07	0.86	3.08	0.16	0.42	0.16	0.36
Iceland	0.00	0.00	0.00	0.06	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.01	0.06	0.00
Ukraine	0.01	0.04	0.00	0.04	0.06	0.08	0.01	0.01	0.03	0.04	0.14	1.43	0.13	0.05	0.67	0.60
Serbia and Montenegro	0.00	0.00	0.00	0.01	0.02	0.03	0.00	0.00	0.00	0.00	0.13	0.37	0.03	0.00	0.01	0.10
Bosnia and Herzegovina	0.01	0.00	0.00	0.00	0.01	0.02	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Belarus	0.01	0.01	0.02	0.03	0.02	0.01	0.00	0.00	0.00	0.02	0.01	0.03	0.06	0.04	0.21	0.06
Iran	0.01	0.02	0.00	0.01	0.03	0.02	0.00	0.01	0.01	0.00	0.05	0.02	0.00	0.02	0.00	0.00
United Arab Emirates	0.00	0.01	0.00	0.03	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.06	0.00	0.00	0.00	0.00
Saudi Arabia	0.01	0.07	0.00	0.09	0.01	0.03	0.01	0.02	0.04	0.00	0.03	0.13	0.00	0.00	0.00	0.00
Egypt	0.01	0.02	0.00	0.04	0.01	0.06	0.01	0.02	0.03	0.00	0.13	0.07	0.01	0.01	0.00	0.00
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Austria's direct export weight	4.77	1.64	0.20	2.35	33.95	6.77	0.30	0.50	2.88	0.60	0.46	0.04	2.74	0.81	0.05	5.06

Source: OeNB/WIFO.

REVISED AND NEW COMPETITIVENESS INDICATORS FOR AUSTRIA
REFLECT IMPROVEMENT TREND SINCE EMU ACCESSION

Table 3

Competition Matrix for the National Exchange Rate Index for Manufactured Goods – Part 2

Market share in %

Competition markets	Target markets															
	Latvia	Lithuania	Malta	Poland	Sweden	Slovenia	Slovakia	United Kingdom	Australia	Canada	Japan	Norway	Switzerland	U.S.A.	South Korea	Hong Kong
France	2.37	2.75	13.83	3.18	3.38	10.25	2.96	4.36	0.84	0.68	0.18	1.83	7.16	0.58	0.51	1.65
Belgium	1.29	1.76	1.31	1.54	2.01	1.52	1.51	2.92	0.49	0.19	0.08	1.06	2.15	0.24	0.11	0.90
Luxembourg	0.07	0.11	0.02	0.09	0.07	0.20	0.03	0.11	0.01	0.01	0.00	0.04	0.11	0.01	0.00	0.01
Netherlands	2.03	1.65	1.51	1.81	2.43	2.44	1.58	2.51	0.34	0.16	0.07	2.30	2.25	0.17	0.19	0.36
Germany	12.88	14.45	7.10	14.09	8.66	22.12	24.58	7.37	2.33	1.15	0.54	7.12	20.86	1.44	0.92	2.52
Italy	3.35	4.05	12.88	4.08	1.80	17.78	5.33	2.73	1.22	0.56	0.17	1.68	6.89	0.56	0.39	2.01
Ireland	0.34	0.23	0.25	0.30	0.87	0.37	0.27	2.49	0.38	0.10	0.12	0.83	1.84	0.32	0.15	0.31
Portugal	0.10	0.12	0.20	0.10	0.30	0.07	0.08	0.45	0.07	0.02	0.00	0.43	0.22	0.03	0.00	0.05
Spain	0.56	1.31	2.22	0.90	0.81	2.65	1.78	1.45	0.23	0.11	0.03	0.91	0.84	0.10	0.05	0.28
Finland	5.99	3.04	0.14	0.82	2.61	0.38	0.56	0.62	0.27	0.09	0.03	1.93	0.57	0.09	0.07	0.24
Greece	0.08	0.07	0.96	0.04	0.07	0.10	0.03	0.09	0.02	0.01	0.00	0.06	0.07	0.01	0.00	0.03
Cyprus	0.00	0.00	0.04	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Czech Republic	1.07	1.79	0.10	1.55	0.28	2.27	15.51	0.23	0.02	0.02	0.00	0.22	0.35	0.02	0.01	0.06
Denmark	2.17	3.16	0.36	0.79	3.30	0.43	0.30	0.50	0.17	0.07	0.03	4.09	0.45	0.05	0.05	0.10
Estonia	5.07	1.60	0.01	0.02	0.39	0.00	0.00	0.01	0.00	0.00	0.00	0.11	0.01	0.00	0.00	0.00
Hungary	0.45	0.45	0.08	0.52	0.19	1.50	1.91	0.21	0.02	0.01	0.00	0.06	0.27	0.04	0.00	0.02
Latvia	17.91	2.02	0.01	0.03	0.06	0.04	0.06	0.01	0.00	0.00	0.00	0.03	0.01	0.00	0.00	0.00
Lithuania	4.12	29.35	0.00	0.09	0.10	0.01	0.02	0.03	0.00	0.00	0.00	0.07	0.01	0.00	0.00	0.00
Malta	0.00	0.00	9.86	0.00	0.00	0.00	0.01	0.03	0.00	0.00	0.00	0.00	0.09	0.01	0.00	0.01
Poland	3.54	8.83	0.85	59.86	0.57	1.01	2.20	0.22	0.01	0.04	0.00	0.54	0.20	0.02	0.01	0.02
Sweden	4.68	2.91	0.28	1.39	58.04	1.61	0.76	1.00	0.60	0.25	0.09	10.10	0.92	0.17	0.10	0.38
Slovenia	0.19	0.37	0.04	0.25	0.05	20.46	0.57	0.03	0.01	0.01	0.00	0.03	0.08	0.01	0.00	0.00
Slovakia	0.41	0.34	0.08	0.59	0.08	1.07	31.43	0.04	0.01	0.00	0.00	0.07	0.17	0.00	0.00	0.00
United Kingdom	2.15	2.84	6.52	2.02	4.27	2.28	1.76	55.69	2.24	0.95	0.23	4.56	3.95	0.87	0.31	2.53
Australia	0.00	0.00	0.03	0.01	0.03	0.01	0.01	0.12	65.21	0.04	0.08	0.03	0.05	0.07	0.25	0.69
Canada	0.13	0.10	0.16	0.08	0.10	0.15	0.04	0.44	0.37	49.63	0.07	0.23	0.17	4.09	0.14	0.39
Japan	0.20	0.23	5.49	0.42	1.41	0.75	0.24	2.40	5.88	2.05	91.53	1.81	1.67	3.31	6.21	16.34
Norway	0.47	0.46	2.32	0.19	1.73	0.06	0.10	0.32	0.05	0.03	0.02	53.45	0.13	0.03	0.07	0.05
Switzerland	1.02	0.58	0.75	0.78	0.80	1.67	1.05	0.80	0.47	0.21	0.16	0.57	39.16	0.26	0.14	1.59
U.S.A.	1.34	1.02	6.43	0.70	2.78	1.09	0.71	5.90	7.27	39.29	1.95	2.46	4.44	78.54	4.72	7.03
South Korea	0.25	0.29	5.74	0.73	0.40	0.75	0.12	0.82	1.45	0.59	0.62	0.86	0.25	0.84	79.92	6.12
Hong Kong	0.00	0.00	0.07	0.01	0.13	0.02	0.00	0.23	0.09	0.12	0.03	0.03	0.12	0.17	0.04	3.26
Singapore	0.06	0.03	10.05	0.05	0.07	0.05	0.03	0.62	1.75	0.13	0.39	0.08	0.38	0.55	1.04	5.43
New Zealand	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.03	1.07	0.02	0.03	0.01	0.01	0.02	0.04	0.07
Algeria	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Argentina	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.03	0.03	0.01	0.01	0.02	0.03	0.00	0.03
Brazil	0.01	0.01	0.03	0.14	0.12	0.01	0.03	0.15	0.10	0.10	0.04	0.03	0.25	0.26	0.07	0.16
Bulgaria	0.06	0.06	0.03	0.02	0.02	0.04	0.05	0.02	0.00	0.00	0.00	0.01	0.03	0.00	0.00	0.00
China	0.64	0.67	1.36	0.91	0.62	0.64	0.33	1.05	2.26	0.84	1.56	0.74	0.60	1.25	2.03	28.78
Croatia	0.04	0.03	1.88	0.02	0.02	2.69	0.06	0.01	0.00	0.00	0.00	0.08	0.02	0.00	0.00	0.00
India	0.08	0.11	0.46	0.07	0.12	0.14	0.06	0.33	0.26	0.16	0.04	0.09	0.35	0.20	0.09	1.78
Indonesia	0.02	0.04	0.05	0.06	0.06	0.04	0.03	0.22	0.54	0.09	0.21	0.06	0.07	0.16	0.19	0.78
Israel	0.26	0.08	0.43	0.13	0.09	0.51	0.08	0.21	0.18	0.08	0.04	0.07	0.36	0.28	0.09	0.89
Malaysia	0.15	0.03	1.64	0.05	0.15	0.07	0.07	0.49	1.16	0.19	0.40	0.08	0.14	0.47	0.42	2.67
Mexico	0.00	0.00	0.01	0.01	0.02	0.03	0.00	0.09	0.06	0.77	0.02	0.02	3.11	0.05	0.11	0.11
Morocco	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
Philippines	0.00	0.00	0.01	0.01	0.04	0.02	0.03	0.24	0.17	0.08	0.21	0.02	0.04	0.26	0.24	1.21
Romania	0.02	0.02	0.47	0.11	0.06	0.16	0.16	0.09	0.00	0.01	0.00	0.10	0.04	0.01	0.00	0.01
Russian Federation	18.90	9.06	1.05	0.30	0.08	0.62	1.85	0.32	0.00	0.02	0.06	0.16	0.58	0.07	0.09	0.06
South Africa	0.00	0.03	0.02	0.01	0.06	0.03	0.01	0.30	0.28	0.04	0.04	0.01	0.22	0.05	0.11	0.18
Taiwan	0.17	0.34	0.62	0.46	0.38	0.64	0.63	0.74	1.15	0.80	0.56	0.59	0.46	0.83	0.84	8.76
Thailand	0.02	0.02	0.22	0.06	0.20	0.03	0.02	0.36	0.79	0.14	0.32	0.07	0.29	0.29	0.19	1.83
Turkey	0.28	0.38	1.57	0.22	0.14	0.44	0.12	0.33	0.05	0.04	0.00	0.11	0.16	0.07	0.02	0.08
Iceland	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.04	0.05	0.00	0.00	0.00
Ukraine	3.24	1.15	0.04	0.19	0.01	0.09	0.70	0.02	0.00	0.01	0.00	0.04	0.02	0.01	0.02	0.01
Serbia and Montenegro	0.02	0.00	0.01	0.01	0.00	0.31	0.05	0.00	0.00	0.00	0.00	0.01	0.07	0.00	0.00	0.00
Bosnia and Herzegovina	0.00	0.00	0.00	0.00	0.00	0.29	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Belarus	1.74	2.05	0.00	0.16	0.01	0.02	0.16	0.01	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.01
Iran	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.02	0.00	0.01	0.03	0.00	0.00	0.00
United Arab Emirates	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.01	0.00	0.01	0.00	0.02	0.01
Saudi Arabia	0.00	0.00	0.35	0.00	0.01	0.00	0.00	0.09	0.06	0.01	0.01	0.01	0.06	0.01	0.04	0.17
Egypt	0.00	0.00	0.02	0.00	0.00	0.03	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Austria's direct export weight	0.07	0.08	0.03	1.68	1.20	1.62	1.12	4.56	0.46	0.79	1.09	0.42	6.20	5.31	0.39	0.60

Source: OeNB/WIFO.

REVISED AND NEW COMPETITIVENESS INDICATORS FOR AUSTRIA
REFLECT IMPROVEMENT TREND SINCE EMU ACCESSION

Table 3

Competition Matrix for the National Exchange Rate Index for Manufactured Goods – Part 3																
Market share in %																
Competition markets	Target markets															
	Singapore	New Zealand	Algeria	Argentina	Brazil	Bulgaria	China	Croatia	India	Indonesia	Israel	Malaysia	Mexico	Morocco	Philippines	Romania
France	1.53	1.04	22.02	1.36	0.88	4.65	0.33	3.16	0.55	0.42	3.01	0.55	0.51	18.57	0.67	3.93
Belgium	0.35	0.51	2.08	0.37	0.30	1.48	0.11	1.46	2.05	0.17	8.43	0.16	0.20	1.62	0.11	1.19
Luxembourg	0.01	0.03	0.04	0.01	0.01	0.05	0.01	0.05	0.01	0.00	0.06	0.00	0.01	0.08	0.01	0.03
Netherlands	0.68	0.38	0.76	0.24	0.19	1.83	0.07	1.41	0.22	0.22	1.76	0.19	0.14	1.39	0.20	1.47
Germany	3.19	2.10	4.34	1.66	2.04	11.89	0.94	12.75	1.25	1.33	6.15	1.33	1.98	4.31	1.21	11.60
Italy	1.25	1.03	7.71	1.54	1.01	8.55	0.28	12.86	0.56	0.43	4.16	0.59	0.71	5.19	0.37	12.46
Ireland	0.42	0.19	0.14	0.08	0.07	0.30	0.02	0.26	0.05	0.05	0.84	0.60	0.12	0.64	0.84	0.20
Portugal	0.06	0.06	0.20	0.06	0.04	0.20	0.00	0.03	0.01	0.00	0.20	0.01	0.02	0.62	0.01	0.06
Spain	0.36	0.26	4.08	1.17	0.51	1.31	0.05	0.84	0.12	0.21	1.85	0.08	0.60	8.08	0.13	0.53
Finland	0.21	0.32	0.08	0.14	0.14	0.66	0.14	0.30	0.14	0.11	0.30	0.09	0.08	0.37	0.48	0.16
Greece	0.01	0.01	0.15	0.01	0.00	5.50	0.00	0.11	0.01	0.01	0.24	0.00	0.00	0.19	0.00	1.30
Cyprus	0.00	0.00	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.02
Czech Republic	0.10	0.01	0.17	0.02	0.02	1.42	0.01	1.59	0.04	0.01	0.16	0.02	0.01	0.07	0.03	0.82
Denmark	0.19	0.18	0.21	0.08	0.07	0.56	0.03	0.44	0.07	0.04	0.27	0.04	0.03	0.16	0.05	0.22
Estonia	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hungary	0.17	0.01	0.05	0.01	0.02	0.93	0.01	1.11	0.01	0.01	0.15	0.03	0.03	0.05	0.04	2.19
Latvia	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lithuania	0.00	0.00	0.02	0.00	0.00	0.05	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01
Malta	0.28	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
Poland	0.10	0.01	0.11	0.03	0.03	0.79	0.01	0.57	0.05	0.01	0.17	0.01	0.02	0.17	0.01	0.60
Sweden	0.43	0.55	0.26	0.34	0.31	0.73	0.18	0.92	0.19	0.24	0.77	0.33	0.27	1.00	0.19	0.72
Slovenia	0.00	0.01	0.12	0.01	0.01	0.44	0.00	6.80	0.01	0.00	0.04	0.00	0.00	0.01	0.00	0.25
Slovakia	0.01	0.00	0.03	0.02	0.00	0.47	0.00	0.57	0.03	0.01	0.03	0.00	0.01	0.03	0.01	0.47
United Kingdom	1.93	2.01	1.21	0.58	0.43	1.93	0.22	1.14	1.30	0.45	4.66	0.86	0.41	4.09	0.63	2.44
Australia	0.57	12.14	0.01	0.03	0.04	0.01	0.06	0.01	0.12	0.72	0.11	0.39	0.01	0.01	0.38	0.02
Canada	0.20	0.40	0.37	0.18	0.23	0.07	0.14	0.24	0.12	0.14	0.51	0.12	0.39	0.08	0.12	0.09
Japan	14.58	5.87	1.87	0.97	1.01	0.34	3.19	0.14	1.47	7.58	2.70	8.20	2.04	1.11	13.22	0.09
Norway	0.18	0.06	0.01	0.01	0.02	0.04	0.02	0.31	0.03	0.01	0.09	0.02	0.01	0.12	0.03	0.07
Switzerland	0.83	0.41	0.75	0.37	0.33	1.27	0.10	0.93	0.26	0.17	2.30	0.23	0.27	0.68	0.24	0.76
U.S.A.	13.31	7.79	5.15	5.86	5.67	0.89	1.49	0.97	1.98	1.69	14.61	6.10	34.65	2.16	10.19	1.08
South Korea	4.07	1.14	1.94	0.60	0.65	0.32	1.77	0.41	0.86	3.52	1.45	2.30	1.00	0.72	4.30	0.85
Hong Kong	0.43	0.08	0.00	0.03	0.01	0.02	0.76	0.00	0.09	0.10	0.04	0.19	0.04	0.04	0.39	0.00
Singapore	21.57	1.60	0.07	0.11	0.12	0.16	0.51	0.06	1.50	0.00	0.49	13.74	0.34	0.25	3.98	0.01
New Zealand	0.06	55.62	0.01	0.02	0.01	0.00	0.01	0.00	0.01	0.02	0.01	0.03	0.01	0.01	0.04	0.00
Algeria	0.00	0.00	36.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00
Argentina	0.02	0.03	0.08	74.44	1.43	0.00	0.02	0.00	0.02	0.01	0.01	0.04	0.13	0.06	0.02	0.00
Brazil	0.13	0.08	0.14	7.32	82.74	0.02	0.04	0.04	0.06	0.08	0.12	0.04	0.65	0.28	0.04	0.01
Bulgaria	0.00	0.00	0.04	0.00	0.00	40.88	0.00	0.03	0.00	0.00	0.03	0.00	0.00	0.01	0.00	0.26
China	4.31	1.80	1.52	0.85	0.47	0.97	85.81	0.92	0.73	2.49	1.82	1.48	0.56	1.64	1.91	0.91
Croatia	0.01	0.00	0.01	0.00	0.00	0.03	0.00	47.00	0.01	0.00	0.01	0.00	0.00	0.02	0.00	0.01
India	0.61	0.26	0.17	0.11	0.08	0.09	0.05	0.04	83.22	0.30	1.22	0.29	0.08	0.31	0.17	0.04
Indonesia	3.80	0.45	0.29	0.09	0.05	0.15	0.11	0.02	0.16	75.61	0.00	0.84	0.08	0.10	0.75	0.02
Israel	0.25	0.15	0.00	0.13	0.13	0.16	0.03	0.09	0.34	0.02	36.11	0.35	0.07	0.06	0.34	0.49
Malaysia	12.59	0.94	0.05	0.11	0.09	0.18	0.25	0.03	0.39	1.23	0.00	55.53	0.23	0.11	1.80	0.04
Mexico	0.28	0.07	0.01	0.38	0.21	0.00	0.02	0.00	0.01	0.01	0.03	0.03	53.03	0.01	0.02	0.00
Morocco	0.00	0.12	0.08	0.01	0.02	0.00	0.00	0.02	0.20	0.00	0.00	0.00	0.00	42.78	0.00	0.00
Philippines	2.31	0.06	0.01	0.02	0.01	0.02	0.07	0.01	0.04	0.14	0.12	0.90	0.09	0.02	52.93	0.00
Romania	0.01	0.00	0.15	0.01	0.00	0.99	0.00	0.10	0.02	0.00	0.12	0.01	0.01	0.06	0.01	51.65
Russian Federation	0.17	0.02	0.76	0.04	0.09	2.57	0.34	0.14	0.56	0.02	0.23	0.22	0.04	0.40	0.09	0.40
South Africa	0.15	0.14	0.28	0.09	0.07	0.04	0.02	0.01	0.17	0.07	0.99	0.07	0.05	0.08	0.03	0.03
Taiwan	3.99	1.17	0.17	0.35	0.29	0.40	2.46	0.41	0.29	1.08	1.12	2.46	0.83	0.45	2.39	0.35
Thailand	3.86	0.66	0.20	0.09	0.05	0.08	0.18	0.05	0.25	0.92	0.64	1.40	0.16	0.10	1.40	0.05
Turkey	0.11	0.03	3.67	0.03	0.01	3.56	0.01	0.24	0.03	0.02	1.62	0.01	0.02	0.53	0.01	1.33
Iceland	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
Ukraine	0.06	0.00	1.32	0.01	0.02	2.66	0.06	0.24	0.09	0.09	0.15	0.01	0.02	0.31	0.12	0.48
Serbia and Montenegro	0.00	0.00	0.03	0.00	0.00	0.19	0.00	0.35	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.08
Bosnia and Herzegovina	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Belarus	0.00	0.00	0.16	0.00	0.03	0.12	0.02	0.14	0.03	0.01	0.00	0.01	0.00	0.07	0.00	0.10
Iran	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.06	0.02	0.00	0.00	0.00	0.01	0.00	0.02
United Arab Emirates	0.03	0.03	0.08	0.00	0.00	0.00	0.00	0.00	0.03	0.04	0.00	0.02	0.00	0.02	0.03	0.00
Saudi Arabia	0.20	0.13	0.16	0.01	0.00	0.00	0.04	0.02	0.17	0.15	0.00	0.05	0.00	0.52	0.07	0.01
Egypt	0.00	0.00	0.10	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.01	0.00	0.11	0.00	0.04
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Austria's direct export weight	0.32	0.07	0.11	0.13	0.48	0.34	0.90	1.00	0.19	0.24	0.21	0.15	0.24	0.05	0.12	0.77

Source: OeNB/WIFO.

REVISED AND NEW COMPETITIVENESS INDICATORS FOR AUSTRIA
REFLECT IMPROVEMENT TREND SINCE EMU ACCESSION

Table 3

Competition Matrix for the National Exchange Rate Index for Manufactured Goods – Part 4

Market share in %

Competition markets	Target markets															Double weighting
	Russian Federation	South Africa	Taiwan	Thailand	Turkey	Iceland	Ukraine	Serbia and Montenegro	Bosnia and Herzegovina	Belarus	Iran	United Arab Emirates	Saudi Arabia	Egypt	Rest of the world	
France	0.94	1.38	0.75	0.96	2.51	2.53	1.04	0.93	1.39	0.58	0.96	5.01	1.85	3.62	6.39	6.86
Belgium	0.43	0.79	0.18	0.73	1.17	1.44	0.78	0.38	0.65	0.47	0.31	1.47	0.77	1.10	1.70	2.70
Luxembourg	0.02	0.02	0.01	0.01	0.03	0.14	0.05	0.02	0.03	0.02	0.00	0.03	0.02	0.03	0.07	0.24
Netherlands	0.65	0.90	0.54	0.38	1.04	3.20	0.68	0.43	1.00	0.76	0.23	1.54	0.72	0.93	4.36	2.41
Germany	4.25	5.20	1.91	2.53	5.65	8.66	5.73	3.80	10.14	7.02	1.80	5.09	3.89	5.36	14.56	28.75
Italy	1.68	1.33	0.49	0.73	3.25	1.94	2.06	4.48	10.14	1.52	1.20	4.10	2.68	5.23	5.79	8.79
Ireland	0.09	0.54	0.11	0.12	0.27	1.14	0.10	0.04	0.14	0.03	0.01	0.37	0.32	0.24	0.63	0.94
Portugal	0.01	0.08	0.01	0.02	0.06	0.43	0.01	0.01	0.01	0.01	0.01	0.05	0.09	0.05	0.34	0.58
Spain	0.26	0.40	0.11	0.23	1.19	1.67	0.26	0.28	0.60	0.15	0.36	0.71	0.96	1.32	2.17	3.06
Finland	1.30	0.43	0.13	0.31	0.40	1.25	0.46	0.04	0.09	0.22	0.10	0.72	0.27	0.31	0.81	0.90
Greece	0.13	0.01	0.00	0.02	0.11	0.07	0.10	0.90	0.25	0.03	0.02	0.14	0.08	0.18	0.25	0.33
Cyprus	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.02	0.01
Czech Republic	0.28	0.02	0.01	0.03	0.11	0.33	0.64	0.58	1.71	0.64	0.07	0.31	0.06	0.23	0.63	2.16
Denmark	0.19	0.12	0.05	0.14	0.14	8.25	0.26	0.29	0.34	0.18	0.06	0.21	0.19	0.46	0.99	0.79
Estonia	0.11	0.00	0.00	0.00	0.01	0.04	0.21	0.01	0.00	0.15	0.00	0.00	0.00	0.00	0.03	0.06
Hungary	0.19	0.04	0.03	0.02	0.13	0.07	0.61	1.01	2.28	0.22	0.04	0.05	0.04	0.08	0.76	2.38
Latvia	0.05	0.00	0.00	0.00	0.00	0.07	0.13	0.00	0.01	0.27	0.01	0.00	0.00	0.00	0.01	0.03
Lithuania	0.17	0.00	0.00	0.00	0.05	0.05	0.31	0.01	0.00	1.06	0.00	0.00	0.00	0.00	0.02	0.06
Malta	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.02	0.03
Poland	0.44	0.02	0.02	0.05	0.10	2.73	2.91	0.21	0.66	2.30	0.04	0.08	0.05	0.21	0.41	1.70
Sweden	0.40	0.46	0.27	0.37	0.70	5.32	0.47	0.56	0.65	0.17	0.22	0.55	0.80	0.87	0.80	1.54
Slovenia	0.14	0.01	0.00	0.01	0.04	0.05	0.16	1.30	10.34	0.18	0.04	0.04	0.03	0.11	0.30	0.60
Slovakia	0.08	0.01	0.00	0.01	0.04	0.02	0.46	0.24	0.43	0.10	0.01	0.02	0.01	0.10	0.30	0.70
United Kingdom	0.67	2.68	0.55	1.05	1.84	7.32	1.07	0.45	0.84	0.55	0.66	5.00	3.24	2.47	7.47	5.35
Australia	0.00	0.29	0.40	0.74	0.02	0.02	0.00	0.01	0.00	0.00	0.02	0.42	1.10	0.04	0.92	0.38
Canada	0.07	0.12	0.19	0.19	0.06	0.36	0.05	0.03	0.05	0.01	0.04	0.21	0.31	0.29	0.59	0.76
Japan	0.41	2.48	13.44	18.31	0.91	2.29	0.20	0.16	0.29	0.04	0.90	6.47	6.13	2.78	7.19	3.16
Norway	0.05	0.04	0.02	0.02	0.06	3.57	0.05	0.07	0.11	0.01	0.02	0.17	0.09	0.11	0.32	0.42
Switzerland	0.25	0.49	0.41	0.67	0.71	0.52	0.33	0.65	0.64	0.18	0.35	1.10	1.02	0.93	1.65	3.59
U.S.A.	0.99	3.63	7.69	7.48	2.36	6.38	0.62	0.22	0.94	0.25	0.00	5.13	9.80	8.28	13.26	7.49
South Korea	0.49	0.73	3.06	2.78	0.85	0.92	0.63	0.13	0.10	0.08	1.44	4.43	2.37	1.93	4.67	1.01
Hong Kong	0.01	0.03	0.33	0.25	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.11	0.01	0.06	0.18	0.12
Singapore	0.07	0.49	3.00	7.80	0.13	0.02	0.05	0.01	0.00	0.00	0.12	2.29	0.48	0.45	1.56	0.56
New Zealand	0.00	0.03	0.03	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.04	0.02	0.01	0.10	0.06
Algeria	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.05
Argentina	0.00	0.05	0.01	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.02	0.06	0.74	0.14
Brazil	0.01	0.38	0.11	0.18	0.11	0.05	0.00	0.00	0.01	0.01	0.03	0.21	0.10	0.22	1.87	0.57
Bulgaria	0.08	0.00	0.00	0.00	0.17	0.00	0.68	0.64	0.26	0.07	0.01	0.01	0.00	0.07	0.09	0.19
China	1.36	1.36	2.00	2.79	0.69	0.68	0.64	0.56	0.04	0.22	0.97	4.99	2.05	2.73	4.59	2.04
Croatia	0.05	0.00	0.00	0.00	0.01	0.01	0.03	0.46	10.61	0.04	0.00	0.01	0.01	0.02	0.20	0.58
India	0.44	0.39	0.12	0.68	0.22	0.15	0.22	0.05	0.02	0.04	0.23	5.19	0.81	0.77	1.52	0.40
Indonesia	0.02	0.20	0.39	1.00	0.09	0.05	0.05	0.01	0.01	0.00	0.15	1.79	0.85	0.67	0.80	0.35
Israel	0.09	0.32	0.17	0.50	0.32	0.12	0.23	0.04	0.06	0.06	0.00	0.00	0.00	0.18	0.73	0.28
Malaysia	0.04	0.23	1.41	3.60	0.20	0.05	0.03	0.03	0.00	0.02	0.09	1.80	0.42	0.28	0.63	0.42
Mexico	0.00	0.02	0.06	0.10	0.01	0.02	0.00	0.00	0.00	0.00	0.02	0.05	0.03	0.02	1.37	0.43
Morocco	0.00	0.00	0.00	0.02	0.03	0.00	0.00	0.00	0.00	0.00	0.05	0.01	0.08	0.02	0.09	0.07
Philippines	0.00	0.04	1.24	1.74	0.01	0.01	0.01	0.00	0.02	0.00	0.00	0.15	0.03	0.01	0.12	0.22
Romania	0.02	0.00	0.01	0.04	0.32	0.01	0.14	0.74	0.30	0.03	0.03	0.09	0.03	0.34	0.18	0.57
Russian Federation	78.71	0.03	0.14	0.09	1.00	0.02	6.47	0.56	0.10	0.00	0.85	0.35	0.10	1.19	1.22	1.18
South Africa	0.01	72.91	0.17	0.21	0.05	0.03	0.00	0.02	0.01	0.00	0.03	0.28	0.13	0.07	1.56	0.46
Taiwan	0.06	0.75	59.36	3.37	0.35	0.58	0.06	0.03	0.00	0.26	0.16	1.38	0.51	0.44	1.14	0.89
Thailand	0.02	0.32	0.87	39.02	0.10	0.16	0.04	0.02	0.00	0.00	0.06	1.27	0.49	0.32	1.08	0.32
Turkey	0.40	0.09	0.02	0.03	71.57	0.11	0.87	0.64	1.01	0.13	0.30	0.71	0.53	1.29	1.13	0.86
Iceland	0.00	0.00	0.00	0.00	0.00	37.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03
Ukraine	1.65	0.01	0.06	0.19	0.58	0.02	69.05	0.33	0.16	2.34	0.15	0.16	0.05	0.60	0.67	0.35
Serbia and Montenegro	0.04	0.00	0.00	0.00	0.01	0.00	0.07	78.14	7.19	0.05	0.00	0.00	0.00	0.03	0.07	0.24
Bosnia and Herzegovina	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.38	36.30	0.00	0.00	0.00	0.00	0.01	0.01	0.09
Belarus	2.17	0.01	0.01	0.01	0.03	0.05	0.81	0.09	0.01	79.52	0.03	0.03	0.00	0.05	0.09	0.10
Iran	0.01	0.03	0.02	0.08	0.07	0.00	0.15	0.00	0.01	0.00	87.69	0.42	0.11	0.04	0.25	0.32
United Arab Emirates	0.01	0.01	0.04	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.04	34.02	0.09	0.03	0.14	0.11
Saudi Arabia	0.00	0.08	0.04	0.23	0.07	0.00	0.00	0.00	0.00	0.00	0.09	1.08	56.00	1.05	0.29	0.15
Egypt	0.00	0.01	0.00	0.00	0.02	0.00	0.01	0.00	0.01	0.00	0.00	0.05	0.14	51.65	0.09	0.11
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Austria's direct export weight	1.02	0.43	0.36	0.18	0.68	0.03	0.31	0.25	0.19	0.06	0.34	0.29	0.21	0.19	1.43	100.00

Source: OeNB/WIFO.

REVISED AND NEW COMPETITIVENESS INDICATORS FOR AUSTRIA
REFLECT IMPROVEMENT TREND SINCE EMU ACCESSION

Table 4

Competition Matrix for the National Exchange Rate Index for Travel and Tourism – Part 1

Market share in %

Competition markets	Target markets															
	France	Belgium	Luxembourg	Netherlands	Germany	Italy	Ireland	Portugal	Spain	Finland	Greece	Cyprus	Czech Republic	Denmark	Hungary	Poland
France	74.88	19.84	28.09	6.19	3.23	6.01	4.82	5.84	9.00	1.42	1.48	5.25	0.76	3.36	0.87	0.38
Belgium	2.55	24.32	20.11	4.99	0.58	0.34	0.72	0.88	0.97	0.97	0.45	2.30	0.39	0.67	0.39	0.06
Luxembourg	0.42	1.60	8.61	1.41	0.09	0.04	0.13	0.14	0.05	0.05	0.04	0.10	0.08	0.09	0.17	0.01
Netherlands	0.51	8.07	1.81	54.15	1.91	0.39	0.89	0.43	0.74	0.41	0.22	1.34	0.12	1.50	0.10	0.03
Germany	2.34	5.66	11.43	9.13	62.09	2.62	2.27	4.33	3.75	13.41	2.21	0.00	5.47	13.98	1.87	2.42
Italy	3.79	3.86	1.86	3.57	5.64	71.58	4.78	2.69	5.63	2.05	11.48	3.09	3.83	3.01	5.70	1.00
Ireland	0.19	0.28	0.29	0.33	0.33	0.31	21.78	0.14	0.20	0.43	0.04	0.00	0.07	0.25	0.00	0.00
Portugal	1.28	0.79	1.18	0.80	0.66	0.32	2.76	50.38	5.72	1.07	0.12	0.41	0.07	0.92	0.17	0.05
Spain	3.67	9.59	6.61	5.48	7.01	3.02	17.52	21.76	56.26	6.54	0.82	0.00	3.21	6.47	1.61	0.63
Finland	0.05	0.16	0.07	0.17	0.10	0.10	0.19	0.15	0.22	51.83	0.17	0.02	0.19	0.41	0.34	0.05
Greece	0.24	5.51	0.56	0.50	1.35	0.73	0.11	0.20	0.29	0.24	34.68	41.04	0.18	0.69	0.15	0.02
Cyprus	0.02	0.41	0.28	0.12	0.22	0.05	1.27	0.01	0.01	0.46	0.50	11.86	0.05	0.50	0.38	0.08
Czech Republic	0.08	0.22	0.15	0.32	0.91	0.36	0.14	0.12	0.48	0.39	0.15	0.40	70.15	0.99	0.96	0.78
Denmark	0.02	0.04	0.06	0.17	1.64	0.07	0.07	0.09	0.10	0.37	0.14	0.36	0.02	45.77	0.02	0.02
Hungary	0.05	0.12	0.05	0.10	0.72	0.38	0.00	0.05	0.11	0.40	0.04	0.00	0.18	0.33	67.80	0.14
Poland	0.07	0.07	0.06	0.07	0.81	0.30	0.05	0.09	0.03	0.24	0.01	0.03	3.93	0.45	0.18	89.12
Sweden	0.15	0.31	0.27	0.32	0.44	0.20	0.27	0.42	0.91	8.31	1.10	5.13	0.11	5.98	0.19	0.10
Slovenia	0.01	0.05	0.01	0.01	0.13	0.37	0.08	0.00	0.01	0.03	0.01	0.16	0.37	0.03	0.54	0.02
Slovakia	0.01	0.02	0.00	0.01	0.09	0.04	0.01	0.01	0.01	0.02	0.01	0.05	2.98	0.03	0.11	0.04
United Kingdom	1.68	3.35	2.76	2.62	1.92	2.15	26.57	3.23	4.64	2.16	6.31	14.50	2.11	3.67	3.70	0.69
Australia	0.15	0.23	0.31	0.09	0.36	0.43	4.03	0.40	0.20	0.52	1.04	1.23	0.09	1.04	0.41	0.06
Canada	0.38	0.54	0.61	1.09	0.31	0.40	0.94	1.61	0.58	0.30	0.88	0.09	0.11	0.44	4.09	0.59
Japan	0.18	0.39	0.53	0.05	0.19	0.41	0.56	0.23	0.08	0.27	0.58	0.00	0.06	0.14	0.03	0.00
Switzerland	1.38	2.20	2.24	1.53	2.64	2.35	0.29	0.75	0.90	0.74	1.38	0.00	0.40	0.71	0.46	0.06
U.S.A.	5.22	8.56	9.14	6.11	2.93	5.04	9.32	5.30	8.72	2.34	35.94	10.17	2.04	3.51	7.59	1.54
Croatia	0.01	0.05	0.03	0.07	0.53	0.40	0.03	0.02	0.01	0.01	0.01	0.00	2.45	0.06	1.72	0.23
Russian Federation	0.07	0.04	0.03	0.04	0.15	0.27	0.09	0.03	0.08	3.50	0.02	0.31	0.13	0.14	0.25	1.79
Thailand	0.16	0.33	0.20	0.07	0.33	0.31	0.00	0.18	0.06	0.90	0.03	0.00	0.02	2.48	0.00	0.00
Turkey	0.24	1.60	1.17	0.42	2.10	0.30	0.18	0.34	0.06	0.49	0.07	0.22	0.32	1.49	0.05	0.03
Egypt	0.21	1.79	1.48	0.06	0.60	0.71	0.13	0.17	0.19	0.13	0.09	1.92	0.09	0.86	0.15	0.04
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Austria's direct export weight	1.77	1.96	0.17	5.54	54.25	6.02	0.14	0.13	0.77	0.17	0.20	0.14	0.49	0.75	0.38	0.34

Source: OeNB/WIFO.

REVISED AND NEW COMPETITIVENESS INDICATORS FOR AUSTRIA
REFLECT IMPROVEMENT TREND SINCE EMU ACCESSION

Table 4

Competition Matrix for the National Exchange Rate Index for Travel and Tourism – Part 2

Market share in %

Competition markets	Target markets															Double weight-ing
	Sweden	Slovenia	Slovakia	United Kingdom	Australia	Canada	Japan	Switzerland	U.S.A.	Croatia	Russian Federation	Thailand	Turkey	Egypt	Rest of the world	
France	2.19	0.68	0.46	6.02	0.49	0.95	2.71	16.41	1.01	0.87	2.63	2.38	3.64	8.60	4.28	6.13
Belgium	1.82	0.12	0.10	0.99	0.02	0.05	0.15	0.91	0.16	0.07	0.10	0.06	0.21	0.34	0.45	1.36
Luxembourg	0.05	0.00	0.00	0.07	0.00	0.01	0.09	0.11	0.04	0.00	0.02	0.04	0.03	0.09	0.41	0.21
Netherlands	0.48	0.05	0.38	1.24	0.10	0.42	0.33	1.31	0.22	0.00	0.20	0.30	0.25	0.09	0.54	4.47
Germany	3.60	0.00	1.38	1.50	0.36	0.48	2.36	10.93	0.40	1.91	4.72	0.00	2.60	3.11	2.39	35.74
Italy	1.64	49.65	3.10	2.99	1.09	1.14	5.04	9.62	0.59	39.19	12.05	2.99	3.03	8.01	4.39	9.40
Ireland	0.22	0.00	0.00	1.39	0.33	0.19	0.05	0.18	0.11	0.00	0.00	0.00	0.00	0.00	0.22	0.39
Portugal	0.64	0.11	0.06	1.54	0.10	0.69	0.15	0.75	0.05	0.02	0.12	0.04	0.11	0.06	0.51	0.77
Spain	5.95	0.00	3.37	11.05	0.37	0.28	0.41	9.11	0.38	0.00	4.48	0.00	0.42	0.00	2.55	6.70
Finland	2.37	0.02	0.02	0.13	0.01	0.03	0.18	0.17	0.02	0.01	9.06	0.03	0.01	0.01	0.20	0.23
Greece	0.44	0.03	1.07	1.51	0.28	0.30	0.95	1.35	0.54	0.00	0.22	0.00	0.16	0.52	1.51	1.33
Cyprus	1.43	0.16	0.25	1.38	0.03	0.02	0.00	0.43	0.00	0.00	1.93	0.00	0.00	0.40	0.10	0.31
Czech Republic	0.30	0.77	14.04	0.20	0.04	0.04	0.12	0.15	0.02	1.32	3.13	0.01	0.27	0.03	0.76	0.99
Denmark	9.15	0.01	0.00	0.15	0.03	0.01	0.05	0.11	0.03	0.00	0.02	0.14	0.02	0.12	0.36	1.35
Hungary	0.11	2.45	0.17	0.11	0.01	0.02	0.05	0.09	0.01	0.57	0.34	0.00	0.10	0.00	2.19	0.76
Poland	1.08	0.24	0.35	0.14	0.01	0.01	0.02	0.03	0.01	0.06	0.36	0.01	0.02	0.01	2.86	0.86
Sweden	56.54	0.00	0.06	0.43	0.04	0.05	0.12	0.64	0.07	0.00	0.16	0.27	0.12	0.00	1.49	0.90
Slovenia	0.04	9.30	0.43	0.02	0.01	0.00	0.00	0.07	0.00	22.14	0.12	0.00	0.03	0.00	0.36	0.23
Slovakia	0.01	0.04	55.46	0.01	0.01	0.01	0.00	0.07	0.03	0.05	0.03	0.00	0.00	0.01	0.20	0.18
United Kingdom	2.96	2.65	3.12	56.12	3.29	2.20	2.08	2.72	0.78	2.46	5.89	13.25	7.29	12.09	5.55	6.10
Australia	0.07	0.41	0.20	1.48	83.09	1.12	4.19	0.70	0.26	0.50	0.25	18.70	0.24	0.48	3.22	0.75
Canada	0.69	0.18	0.39	1.08	0.65	67.48	3.04	0.56	1.01	0.00	1.33	4.47	0.96	0.00	1.60	1.05
Japan	0.10	0.04	0.05	0.24	0.43	0.58	44.87	0.07	0.11	0.01	0.52	7.19	0.06	0.09	1.54	0.61
Switzerland	1.00	0.47	0.61	0.71	0.06	0.23	1.79	33.52	0.07	0.29	0.56	0.71	0.32	0.39	0.36	4.18
U.S.A.	5.41	3.11	14.22	7.89	8.61	23.42	27.42	9.27	94.00	3.30	5.72	27.75	8.97	11.49	48.70	11.78
Croatia	0.03	28.24	0.57	0.03	0.00	0.00	0.00	0.03	0.00	27.03	0.18	0.00	0.01	0.00	1.62	0.63
Russian Federation	0.42	0.36	0.03	0.11	0.03	0.04	0.12	0.10	0.02	0.17	43.30	0.16	1.39	0.23	2.23	0.27
Thailand	0.71	0.13	0.00	0.48	0.46	0.16	3.58	0.36	0.04	0.00	0.42	21.46	0.00	0.12	4.17	0.40
Turkey	0.44	0.58	0.11	0.73	0.02	0.01	0.06	0.05	0.01	0.00	1.19	0.00	69.62	0.12	3.19	1.43
Egypt	0.12	0.20	0.02	0.27	0.05	0.04	0.05	0.17	0.01	0.03	0.96	0.04	0.11	53.60	2.09	0.51
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Austria's direct export weight	0.77	0.70	0.18	7.25	0.25	0.73	0.89	6.96	6.90	0.23	0.22	0.02	0.12	0.01	1.55	100.00

Source: OeNB/WIFO.

Reforming the International Monetary Fund – Some Reflections

Herbert Gratz,
Harald Grech

This paper reviews the most recent issues in the ongoing debate on the reform of the International Monetary Fund (IMF).

The Fund has recognized that IMF surveillance should put greater weight on analyzing and discussing global economic issues. By taking account of international spillovers, surveillance should in future be multilateral rather than purely country-specific. Exchange rates and policies should also be the focus of renewed interest.

Moreover, there is no doubt that IMF quotas will have to be adjusted to take account of the changing economic weight of many IMF member countries in the world economy. Negotiations on a new quota formula started after the Annual Meeting in Singapore in September 2006. The influence of low income countries should be strengthened by increasing the number of basic votes in order to prevent the Fund from losing legitimacy. However, with the IMF's intention to put more weight on GDP in the new quota formula, the stage is set for complex, difficult and time-consuming negotiations.

Finally, the IMF will need to reform its financing system and budgeting procedures to ensure that expenditures will be adequately curtailed to enable it to work efficiently despite income shortfalls, which might well be not transitory but of a permanent nature.

JEL classification: F33, F42, F53

Keywords: IMF, representation, constituencies, governance, surveillance.

1 Introduction

The International Monetary Fund (IMF) was officially established when its Articles of Agreement entered into force on December 27, 1945. In accordance with Article I the purposes of the IMF are to promote international monetary cooperation through a permanent institution, facilitate the expansion and balanced growth of international trade and promote exchange stability. Moreover, the IMF has been mandated to assist in the establishment of a multilateral system of payments in respect of current transactions and to make the general resources of the Fund temporarily available in order to shorten the duration and lessen the degree of disequilibrium in the international balances of payments of its members.

Before looking into the ways and means by which the IMF has intended to fulfill this role, it might be useful to see whether its mandate is still ap-

propriate for our times. Reforming the IMF has been on the agenda of international policymakers at least since the early 1970s, when the Bretton Woods System collapsed; doubts have been raised whether the IMF still has the tools appropriate for its mission.

In many respects the Fund plays an important role in international monetary cooperation, proving just how far-sighted its founding fathers were. In some cases, however, its purposes have become outdated and need to be revised.

Specifically, the following arguments have been brought forward:

- Facilitating international trade falls within the competence of the World Trade Organization. As such it need not be listed among the primary purposes of the IMF any longer, even though it will remain of considerable, albeit secondary, interest for the IMF.

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- The emergence of a variety of regional cooperative initiatives, such as the introduction of the euro or the Chiang Mai Initiative, have reduced but not eliminated the need for balance of payments support by the IMF and provide an additional platform on exchange rates and monetary cooperation.
- The role of the IMF as a clearing house for payments for current transactions is more theoretical than practical. The Fund promotes the idea of the liberalization of payments for current transactions in its Article VIII, augments foreign exchange reserves by allocating Special Drawing Rights (SDRs) and can – in extremis – “designate” countries to accept another country’s SDRs. In practice, however, the international monetary system runs smoothly without constant recourse to the IMF.
- The purposes of the Fund, as listed in its Articles of Agreement, cover only indirectly one of the main sources of crisis: the capital account. Citing the capital account explicitly as an area for temporary financing might be appropriate.
- Furthermore, it might be deemed appropriate to augment the Fund’s instruments that are listed in the Articles of Agreement by explicitly including macroeconomic surveillance and technical assistance.
- Finally, in view of the fact that regional cooperations and/or currency unions are becoming more and more widespread it might be opportune to allow such bodies to become IMF members in lieu of (or perhaps in addition to) their composite members.

From the Fund’s purposes we now move on to the instruments which the IMF used in the past to fulfill its tasks and to the question of how to improve and adapt them to master future challenges. Section 2 deals with surveillance issues, section 3 with IMF financing and section 4 briefly outlines the main principles of technical assistance. Section 5 refers to IMF finances and budget, section 6 to issues of representation and governance and section 7 concludes our reflections on reforming the Fund.

2 Surveillance

IMF surveillance is one of the mainstays of cooperation between the Fund and its member countries. It is the conduit through which the IMF tenders advice when no program is in place and the antenna through which the first tremors of upcoming difficulties are transmitted. It is thus imperative that surveillance works well.

However, over the years, surveillance has somewhat lost its focus. In addition to exchange rate, fiscal and financial system surveillance a plethora of irrelevant – or at the very least less relevant – items have entered the surveillance agenda: structural reform, social and anti-money laundering issues. Many of these items fall outside the traditional area of IMF competence and thus necessitated costly recruiting efforts without ultimately achieving the outstanding expertise the Fund needs to rely on in its areas of core competence and which makes its advice so universally respected. A refocus on what the Fund does well is thus urgently needed. This would also help to stop the frequently cited dwindling of its reputation.

At the same time, resources saved could be spent on areas of neglect and

on new interests. Increasing and rapid globalization mandates a move away from the traditional system of only single country-based surveillance toward multilateral and regional consultations.

Since the Fund's 2006 Spring Meeting, the Executive Board of the IMF has put its main emphasis in the fields of implementing its Medium-Term Strategy on surveillance (IMF, 2006a). In order to deal with the challenges of deepening financial market integration and large-scale private capital flows, the IMF started to overhaul its surveillance framework by attaching more importance to the relation between the financial sector and the macroeconomic situation.

Until recently, single-country Article IV consultations were the main basis of surveillance. Complementary to these bilateral consultations, the IMF has now launched the first multilateral surveillance consultation process (IMF, 2006b). Multilateral consultations are intended to provide a forum for discussion on common economic issues and vulnerabilities that affect both individual IMF members and the global financial system. The first multilateral consultation addressed global imbalances and had five participants (China, the euro area, Japan, Saudi Arabia and the U.S.A.) experiencing large current account surpluses/deficits and representing large shares of global output. These recent efforts to conduct multilateral surveillance are a step in the right direction. However, they need to be complemented by more discussion among the countries participating in the exercise as, so far, the IMF has in effect served as a go-between for the participants.

Considering that for the last ten years, the capital account has been the most likely as well as the most grievous source of crisis, the Fund should concentrate more of its efforts on advising on capital movement liberalization and on exchange rate surveillance. The latter is not only a topical issue these days in light of the economic relationship between China and the U.S.A., but can potentially affect the relationship between all major currencies. The IMF has therefore started to review its surveillance activities on exchange rates, which have their foundations – inter alia – in the 1977 Decision on Surveillance over Exchange Rate Policies agreed upon after the breakdown of the Bretton Woods System of fixed exchange rates (IMF, 2005a). Although it is currently not clear yet to what extent the 1977 Decision will be amended, i.e. whether closer links to the Article IV consultations will be established or not, indications are that exchange rate surveillance will be strengthened on operational and analytical grounds. The ECB and national central banks of the euro area thus need to consider carefully what the Fund's role ought to be in this respect, since publications on equilibrium exchange rate levels could lead to undesired market movements. However, deeper involvement of the IMF in exchange rate surveillance and analysis, in particular with regard to emerging market economies, definitely seems to be warranted.

The IMF will also attach greater importance to financial sector surveillance. Financial sector developments have become increasingly important for individual economies as well as for the world economy as a whole. It is high time that the IMF becomes more closely involved in

financial sector surveillance and starts to recommend improvements on a regular basis. One route that could be followed in a promising way is to thoroughly incorporate financial sec-

tor analysis into Article IV surveillance. A close cooperation of the Fund's country departments and its Financial Markets Department seems warranted in this context.

3 Financing

Box 1

IMF Financing

Normally, member countries are granted access to IMF resources to the amount of up to 100% of their quota on an annual basis and up to 300% cumulatively. Under exceptional circumstances or when using some special facilities – such as the Supplementary Reserve Facility (SRF) – this limit can be exceeded: for some special facilities the IMF charges a surcharge on the rate of charge with the aim to encourage early repayment in order to free up funds for future emergencies.

The IMF – other than the World Bank – does not use international capital markets for its financing but relies solely on contributions by its members. In principle, each member country provides 25% of its quota to the Fund in gold or hard currencies. The other 75% of its quota (payable in domestic currency) are available on call. The IMF uses quarterly Financial Transaction Plans (FTPs) to determine the amounts available for “Purchases” (IMF terminology for lending) and “Repurchases” (repayment of loans).

However, only those currencies which are tradable in world financial markets are of immediate practical use to the Fund for lending purposes. If the IMF wants to call upon the part of the quota that is paid in domestic currency, it at first evaluates the reserve position of the country in question (to see whether it is “strong enough” to participate in the FTP) and in a second step asks the respective country to convert the domestic currency amount into freely convertible currencies. By doing so, the IMF makes sure that another country that is in need of financial help does not receive a domestic currency with limited use, but a freely convertible currency that can be used both for domestic purposes and in international capital markets.

The IMF's traditional role is to provide emergency financing for countries with balance of payments problems that stem from e.g. trade imbalances and/or an exploding public external debt situation due to fiscal overspending. In recent years capital account issues have become the primary source of crisis in many countries. The traditional instrument for providing Fund financing, the Stand-By Arrangement in its basic concept, has proven insufficient for resolving a capital account crisis. Although the Fund has introduced an “exceptional” access window (providing financing beyond 300% of quota with an extra surcharge to the rate of charge) and even established a com-

pletely new facility (the Supplementary Reserve Facility – SRF) there is still the question of whether enough has been done. Therefore, some countries have argued in favor of establishing a new insurance-type contingent facility.

At the same time, the Fund is no longer the only source of emergency help/financing. Lately, it has been drawn at an ever increasing pace into providing developing aid and has thus come into conflict with its traditional mandate and other international organizations, such as the World Bank, which have traditionally been active in this field.

The number of capital account-driven crises has risen sharply in the

past decades. The IMF is not entirely without fault in this development: While striving to make the advantages of capital movement liberalization available to as many economies as possible, it has perhaps not taken enough care to take account of all country-specific idiosyncrasies. Also, in some cases speed was given more importance than a carefully designed step-by-step program which avoids the risk of a maturity mismatch of foreign loans and their domestic utilization (i.e. short-term flows being intermediated by the domestic banking system into long-term investments) or accepts an undue amount of currency risk. In fact, there was very little advice on proper sequencing and the risks when of disregarding it. Since the Asian crisis, IMF economists have improved their track record in this respect, and countries interested in pursuing capital movement liberalization have become more circumspect.

In any case, the number of capital account crises can, on the one hand, be considered almost a good sign: It shows that countries are pushing forward with their capital movement liberalization agenda and are thereby removing inequalities and inefficiencies from the global monetary system. At the same time, this trend inevitably poses difficulties when a liberalization process has gone wrong or market sentiment has changed, thus generating a crisis. Such crises are challenging in particular for two reasons: the size and speed of a crisis and the confidence issue. A capital account crisis can happen through contagion and affect perfectly sound countries, but it more frequently affects economies with some underlying economic problems. Sound economic policies and an exchange rate

close to equilibrium do not serve well as breeding grounds for crises and allow a country hit by contagion to recuperate more swiftly. However, once a crisis strikes, the amount of financing needed to restore credibility is – usually – far in excess of the maximum amount of 300% of a country's quota. This problem has led to the establishment of the SRF and of the option of exceptional access.

A concomitant problem is the need for rapid access to financing. The traditional process for program implementation is frequently considered too slow and cumbersome in situations which call for rapid restoration of market confidence. This, in turn, has led to the notion of “contingent financing” which is, in essence, an assurance by the Fund to provide financing for countries with solid economic policies at exceptional access levels more or less automatically when a capital account crisis strikes.

Of course, that approach generates a number of problems: It reduces conditionality (in fact, a peculiar situation would arise in that for a “non-borrowing program” full conditionality would be applied whereas no conditionality would be necessary for a contingent financing-related case of exceptional access); it provides Fund financing with little to no involvement of the Executive Board; and it undermines access limits. Such resources given to the Fund by donor countries for lending-on might no longer be deemed risk-free and therefore could logically not be fully recorded on the asset side of participating central banks. In addition, the signaling effect of such an insurance-type facility might well be negative, premeditating the very crisis it purports to avoid. This latter argument

in fact led to the final demise of the IMF's Contingent Financing Facility for lack of interest. However, the related discussion has shed light on some pertinent facts and areas of possible improvement. It has become obvious that the speed of design and the implementation of programs need to be improved. This can be done by establishing a closer relationship between countries that are possibly confronted with capital account crises and the Fund, by improving administrative processes within the IMF and by concentrating program measures on those areas that are of most immediate effect on the capital account. Publicity and transparency vis-à-vis the financial markets need to be improved in order to turn around sentiment rapidly. The initiative for such efforts should rest with the country concerned, but the Fund should be ready to support them. Finally, the mobilization of exceptionable access financing must be at an acceptable level and not delayed by cumbersome procedures. At the same time, involvement of the Executive Board and strict conditionality must be maintained.

Another issue concerns the fact that regional initiatives have come into existence which provide for an additional level of help before countries turn to the Fund. Examples reach from fairly informal efforts such as the Chiang Mai-Initiative to such full formal integration the European Union and the euro area provide. The challenge for the IMF is how to adjust to these permanent changes, which have a noticeable impact on its own financial structure as members of re-

gional initiatives will presumably turn to their regional partners as a first line of defense in case of crisis. At the same time the coincidence of crises will be reduced with the help of closer regional integration.

It is interesting to note that development aid is not listed among the purposes of the IMF. The reason is straightforward: An organization which depends on a reasonably quick turn-around of its means in order to have funds available for the next crisis cannot afford to have much of its financing more or less permanently sunk into a significant number of long-term problem cases. Nevertheless, IMF members and management have been drawn into granting development aid at an ever increasing pace. This is partly attributable to pressure from the civil society, partly to the desire to look good in the press and partly to competition with the World Bank for the job of an advisor to developing countries. Over time the Fund has established various facilities based on donor country contributions which are used to subsidize lending operations to developing countries (Enhanced Structural Adjustment Facility I, Enhanced Structural Adjustment Facility II, Poverty Reduction and Growth Facility.)¹ These efforts recently culminated in the Multilateral Debt Relief Initiative (MDRI) – an out-right debt forgiveness. Pessimists can be excused for believing that particularly in the latter case, the emphasis lies on debt relief and not on achieving a sustainable external debt position based on sound economic policies guaranteed and fostered by an IMF program based on

¹ As part of its contribution to an enhanced global poverty-reduction effort, the IMF transformed the Enhanced Structural Adjustment Facility into the Poverty Reduction and Growth Facility in 1999.

sound conditionality. Debt Sustainability Analyses and other efforts by the IMF and the World Bank to bring about a sustainable debt environment notwithstanding, in some cases the situation will be back to what it was prior to the Multilateral Debt Relief Initiative in a short while. This dilemma is exemplified by the case of Sudan, which takes up nonconcessional debt² at a speed far outpacing its debt sustainability level. In other cases (e.g. Ghana), however, the MDRI has been more successful in achieving longer-term sustainability. It is perhaps illuminating that – despite (1) having the IMF’s mandate to improve world trade, and (2) the universal acknowledgement that product market liberalization by industrial countries would have a far more positive impact on the developing world than almost any amount of direct aid or debt forgiveness – the Fund has shown little commitment when it comes to convincing the industrial countries to open their markets to third world products. In any case, the IMF should ask itself whether it would not be preferable to concentrate on its core competences and refrain from costly development aid projects in order to earn praise from the press and civil society or to score points at the expense of the World Bank or other development institutions.

4 Technical Assistance

By providing technical assistance (TA) to member countries, the IMF helps countries to build up their human and institutional capacity to design and implement effective macroeconomic and structural policies aimed at putting in place reforms that strengthen their financial sectors and reduce vulnerability to crises (IMF, 2005b). In doing so, the Fund doubtlessly provides a very helpful service. Up to now technical assistance has been provided for free, but in future the IMF could consider charging fees. In order to ensure that countries in need of TA can afford it, the Fund could establish a TA subsidy account and invite donor countries to contribute. The IMF also provides courses at regional centers (such as the Joint Vienna Institute) or in Washington (seat of the IMF Institute) and supports the transfer of know-how and expertise during technical assistance missions to transition economies and developing countries. However, the Fund could give some consideration to streamlining regional institutes as, for instance, maintaining three regional centers for Africa alone may be regarded as excessive.

² *Nonconcessional external debt is defined as having a grant element of less than 35 %.*

5 IMF Finances and Budget

Box 2

The Fund's Budget

The IMF's Financial Year lasts from May 1 until April 30.

Broadly speaking, the **expenditure side** of the Fund's budget consists of administrative expenditures (for staff, buildings, etc.) and the income target, which is used to increase general reserves by 4% p.a. until they have reached a level of SDR 10 billion.

Income sources consist principally of the "margin," i.e. the amount by which the rate of charge¹ is higher than the rate of remuneration² (payments for the funding of the Staff Retirement Plan from an earmarked reserve, which is now exhausted, also used to play a major role). The margin is fixed by the Fund for a year in advance. In addition, there is surcharge income: as stated above the Fund may charge surcharges in some cases of access to high-volume lending (i.e. for lending that exceeds 300% of a country's quota); other sources of income are the return on the Fund's Investment Account and the return on the use of its reserves for lending operations.

¹ The rate of charge is paid for IMF financing by program countries.

² The rate of remuneration (since 1988: 100% of the SDR interest rate) is paid by the IMF for financing provided by its (donor) member countries via the financial transaction plan (up to 100% of members' quota).

The unexpected repayments of some large Fund debtors (such as Argentina and Brazil) resulted in a significant short-fall of expected income for future budgets. As an example, for the 2007 financial year, the IMF's budget *ceteris paribus* was set at SDR 962 million. Assuming that the margin is not raised, the income shortfall would now amount to SDR 442 million, or almost 50%. For the 2009 financial year, the shortfall was projected to be SDR 500 million, thus indicating that the problem will persist in the medium term.

The margin (see box) is the Fund's main source of income. In principle, the IMF may determine the margin at its own discretion. However, the Fund's nature as a supranational institution of common interest and market conditions restricts its room of maneuver to a certain extent. When Turkey, currently the Fund's largest debtor, received an ad hoc quota increase in September 2006, this move put further strains on the income

side. Currently, the margin is 108 basis points. The margin would have to be raised to 360 basis points to make up for the difference between income and expenditures in the Fund's budget. After adding in the effects of the burden-sharing mechanism,³ the margin will reach 400 basis points. In addition, some countries are subject to a surcharge of 100 to 200 basis points above the rate of charge for some of their lending. Assuming that the SDR rate stays constant at its present level of roughly 3.5%, marginal interest rates for Fund lending for those countries could rise from 8.5% to 9.5% per annum. This clearly indicates that raising the margin to such an extent is not a feasible option as any further repayments would rise proportionately and would thus exacerbate the problem further.

The IMF staff has already reacted to the budgetary problems by implementing several measures, mostly on the income side:

³ An upward adjustment to the basic rate of charge and a downward adjustment to the basic rate of remuneration are made to (1) offset losses of income from unpaid charges and (2) to fund certain precautionary balances.

- establishing an Investment Account: this allows for investing the Fund's general reserves in a portfolio of government securities;
- suspending Reserve Accumulation, which includes using surcharge income (which has hitherto been placed into general reserves) for the Fund's expenses;
- reimbursing Poverty Reduction and Growth Facility (PRGF) administration expenses (in the past the PRGF administration costs were borne by the Fund); and
- finally – and this is the most worrying measure – drawing down reserves.

By implementing this package of measures, the IMF will be able to reduce its annual income shortfall for the coming years to SDR 150 to 250 million. However, the Fund's advice to its member countries in similar circumstances would undoubtedly include expenditure cuts. IMF efforts in this area have been most disappointing: The Managing Director envisages cuts of 1% to 2% over the course of the next three years. This is far too little considering that the Fund's income has been halved. One would have expected that the Fund aimed at significant expenditure savings, instead of taking mainly income-side measures, to recuperate

the shortfall. In addition, running down reserves is not an option – neither in the long run as reserves will run out eventually, nor in the short term as their primary purpose is to serve as collateral for donors in case of nonpayment by creditor countries. A significant reduction in reserves would have serious consequences for the Fund's ability to guarantee such financing and for its own financial soundness. It would thus endanger the option of classifying contributions to the Fund as foreign exchange reserves on the balance sheets of participating central banks, or it would at least call for a risk-based reduction of their value.

Expenditure cuts can be envisaged in particular in areas outside the Fund's prime interests and mandate, e.g. the legal systems (Anti-Money Laundering), structural issues or the question of streamlining the cumbersome bureaucratic apparatus.

Last but not least, Staff Papers could profit from more brevity in many cases, which would have the additional positive effect that they could then be placed on the agenda of policymakers without requiring as much screening and content extraction as is the case right now. Such an approach would make the Fund a more relevant source of information for decision-making.

6 Representation and Governance

6.1 Quotas and Voting Shares

Box 3

IMF Quotas

Each member of the IMF is assigned a quota which is expressed in terms of SDRs.

A member's quota has several functions:

- (a) A member's quota subscription determines the maximum amount of financial resources the member is obliged to provide to the IMF. 25% of its quota has to be paid in SDRs or in widely accepted currencies (such as the U.S. dollar, the euro, the Japanese yen or the pound sterling); the remainder may be paid in the member's own currency, see also chapter 3.*
- (b) A member's quota determines the maximum amount of credit that this member may obtain from the IMF. The limit of outstanding credit is 100% of its quota per year, and 300% cumulatively. However, the limit can be higher under exceptional circumstances.*
- (c) A member's quota largely determines its voting power. Each member has 250 basic votes plus one additional vote for each SDR 100,000 of its quota.*
- (d) A member's quota determines the relative share of general SDR allocations.*

Box 4

Basic Votes

Each IMF member country receives 250 votes (so-called "basic votes") and one extra vote for every SDR 100,000 of its quota. From the outset, "...basic votes were to serve the function of recognizing the doctrine of equality of states...", thereby preventing that "... some members might have quotas too small so that they have virtually no sense of participation..." (Gold, 1972).

Basic votes have not been augmented by the same proportions as quota-based votes, which resulted in an all-time low of the ratio of basic votes to total votes ranging between 2% and 3% of total votes. In 1944, IMF member states agreed on basic votes which happened to amount to 11.3% of total votes; the historic high occurred in 1958 with basic votes at a level of 15.6% of total votes.

The downward trend of basic votes caused the influence of developing countries in IMF decision-making to decline (Rapkin and Strand, 2006).

As box 3 shows, IMF quotas are a major factor in IMF governance. A country's quota is directly linked to its voting power, since the number of votes depends on the size of the quota. However, what counts is not the absolute size of the quota but its relative size. Voting is generally based on weighted majority. Voting weights gain particular relevance since special majorities are frequently needed in the decision-making process. The Articles of Agreement enumerate over 50 categories where special majorities

are required. In particular, decisions with a far-reaching impact in terms of policymaking (such as the allocation of SDRs, changes in quotas and the sale of gold) call for majorities of 70% or 85%, whereas "internal" or "administrative" decisions require simple majorities.

A majority of 85%, for instance, is needed in 18 categories, comprising e.g. constitutional revisions and adjustments in quotas (and votes). The U.S.A., the country with the largest quota and a voting share of

currently around 17%, and the euro area countries (by joint action) are able to block major decisions. This vetoing power provides the U.S.A. with a particularly strong informal influence – a situation which might prevent countries from bringing forward issues which are likely to be rejected by the U.S.A. (Kelkar et al., 2004). In this context, Leech (2002) argues that this US-dominated setup is an institutional price which prevents the IMF from passing deeper reform initiatives and thus reduces its capacity to act.

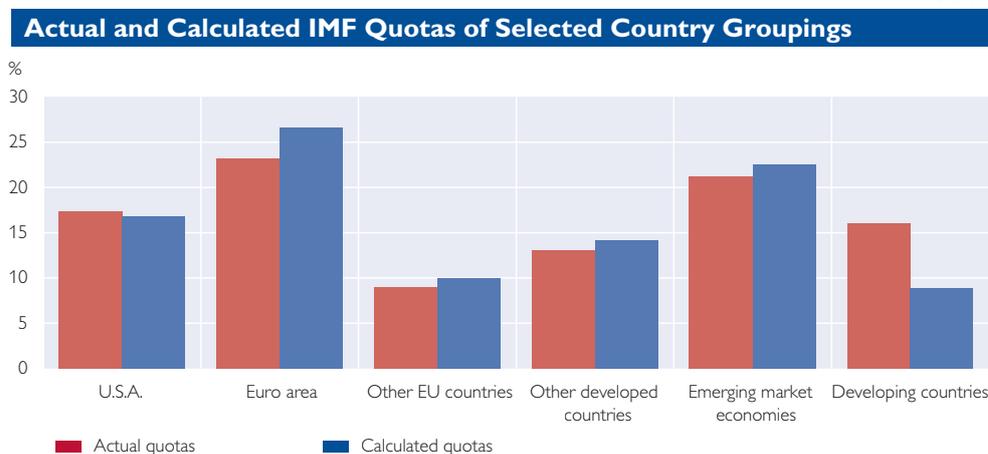
General quota reviews are carried out at five-year intervals. The main purposes of quota reviews are to adjust for members' changing positions in the world economy, to handle the entry of new members and to conduct quota adjustments. Note that quota reviews that result in an overall quota increase not only determine the Fund's new overall quota size but also the relative quota size and therefore individual voting power. Currently, the IMF is conducting its 13th quota review, which is scheduled to be finished in spring 2008. In the past, 8 of 13 reviews have resulted in an overall increase in the size of the IMF quota (Truman, 2006a).

When reviewing IMF quotas, the IMF staff calculates country-specific quotas. Since 1983, when the 8th review was completed, five different formulas have been applied in the quota review. These formulas include the following variables: (1) GDP at current market prices, as an indicator of economic size, (2) reserves, as an indicator of a country's capacity to contribute to the IMF, (3) current payments, as an indicator of openness and a measure for the potential need to borrow from the IMF, (4) current receipts and (5) variability of current receipts, both as additional indicators for the potential need to borrow. For a detailed description and analysis of these five formulas, see IMF (2006c). However, calculated quotas differ significantly from actual quotas, as can be seen from chart 1.

The U.S.A. are slightly, and developing countries considerably, over-represented in the Fund. Euro area countries, other EU countries, other industrialized countries and emerging market economies are under-represented as their calculated quota is higher than the actual quota.

The reason why actual and calculated quotas differ is that calculated quota values only serve as a starting

Chart 1



point and actual quotas are – because of their direct impact on voting power and financial resources – the outcome of long and complex negotiations.

The question whether all 184 IMF member countries are adequately represented at the IMF has recently been a matter of heated debate. It has frequently been argued that the importance of the emerging market economies for the world economy is no longer accurately reflected in their representation in the Fund. This phenomenon has been termed “underrepresentation.” At the same time it is argued that the European countries as a whole, for instance, are “overrepresented.” As far as quotas are concerned, this argumentation is not borne out by facts: A comparison between (formula-derived) calculated and (negotiated) actual quotas shows that Europe as a whole is not overrepresented and that some European countries are in fact sizeably underrepresented (charts 2 and 3). Of course, representation can also be “measured” by a constituency’s num-

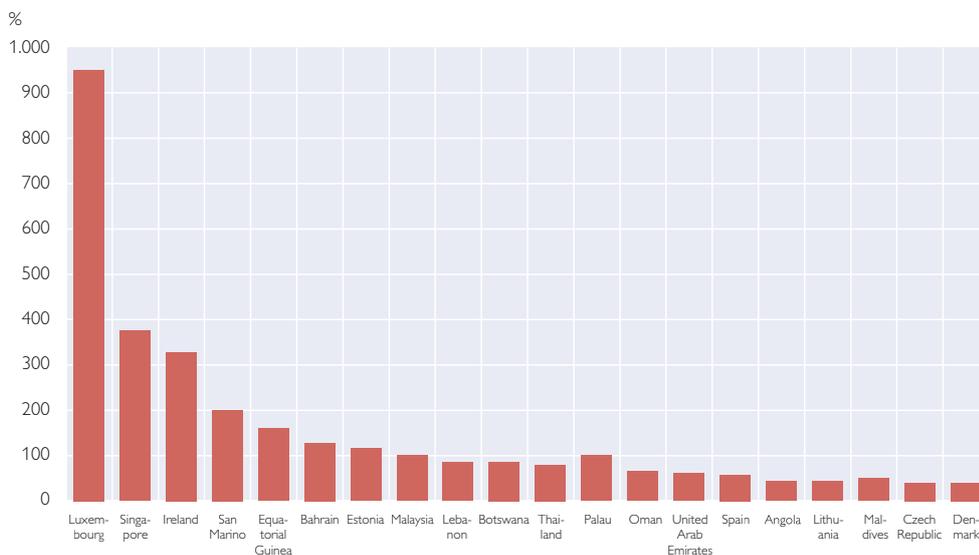
ber of Executive Directors on the Board, and there the critics might have more of a point (see below).

Chart 2 and 3 show the 20 most under-/overrepresented countries at the IMF. The ratio of under-/overrepresentation is presented as a percentage of the calculated quota.

Truman (2006b) ranks the 60 countries with the highest calculated quotas according to the size of their quota and points out that these 60 countries hold 92% of current actual quotas and 95% of calculated quotas. If current quotas were adjusted according to their calculated values, the 60 countries would gain three percentage points in quota shares from the other 124 member countries. Quota shares of 9 of the 10 top-ranking countries (which – with the exception of China and Singapore – are all industrial countries) would rise from 52% to 59%. The quota of 16 countries in this sample would increase by at least 25% and the quota of 21 countries would fall by at least 25%.

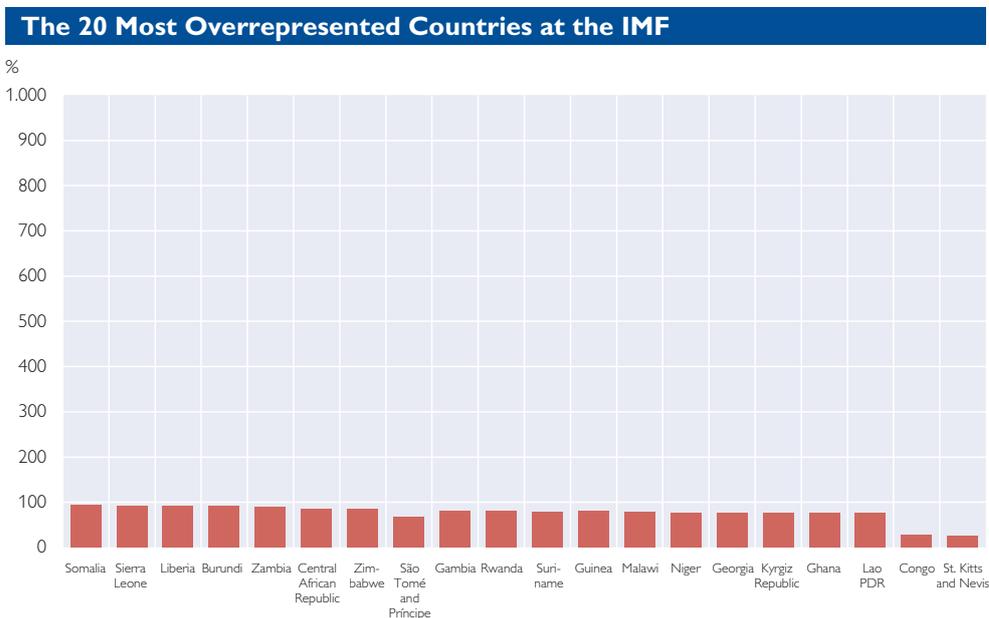
Chart 2

The 20 Most Underrepresented Countries at the IMF



Source: IMF.

Chart 3



Source: IMF.

In another classification, Rapkin and Strand (2006) group IMF member countries according to income levels and add OPEC countries as a separate group (table 1).

The upper middle income countries are the only country group where current and calculated quotas are in line; high-income countries are underrepresented and OPEC, lower middle and low-income countries are

overrepresented in terms of their relative economic position in the world economy.

The adequacy of quota formulas is mainly dealt with in the report of the Quota Formula Review Group (QFRG), an external group of technical experts chaired by Richard Cooper in 2000 established by the Interim Committee of the IMF after the completion of the 11th general

Table 1

Selected Economic Indicators, Current and Calculated Quota

Country/group	Population	Trade	GDP based on PPP	GDP	Current quota	Calculated quota
U.S.A.	4.71	16.51	20.33	32.06	17.46	17.80
Japan	2.10	5.88	6.87	13.57	6.30	7.27
Germany	1.36	8.69	4.49	6.02	6.11	7.02
France	0.98	5.21	3.17	4.28	5.05	4.37
United Kingdom	0.98	6.96	3.07	4.68	5.05	5.72
EU (15 countries)	8.37	38.43	20.95	25.52	30.60	34.16
Euro area (12 countries)	7.16	29.11	17.09	19.59	23.65	23.65
High income (12 countries)	15.18	75.53	52.77	78.87	63.45	73.77
OPEC (11 countries)	8.51	3.51	3.66	3.37	9.77	4.69
Upper middle income (31 countries)	4.53	6.54	5.51	4.66	6.24	6.53
Lower middle income (50 countries)	37.49	12.11	22.25	10.49	14.71	12.16
Low income (59 countries)	34.29	2.31	9.06	2.61	6.15	2.89

Source: Rapkin and Strand (2006); population and PPP/GDP: World Bank (2006); trade, GDP, current quotas, calculated quotas: IMF (2006c).

quota review, see Cooper et al. (2000). The mandate was to review the quota formulas, “...with a view to providing the IMF Executive Board with an independent report on their adequacy...” The experts group’s room for maneuver, however, was rather limited, as it was asked to consider only adjustments that do not necessitate an amendment of the Articles of Agreement.

The main points of the report of the QFRG can be summarized as follows:

Although they emphasized the pivotal role of GDP in measuring a country’s ability to contribute to the Fund, the members of the QFRG did not unanimously agree on how GDP should be converted into a common currency. The members of the QFRG discussed various aspects of converting GDP on the basis of market rates versus PPP-based measures, but only a minority of QFRG members favored PPP-based measures. The QFRG also proposed a new, simplified quota formula which contains only two variables: GDP, as a measure for contribution to IMF resources, and the variability of current receipts, as a measure for external vulnerability. Nevertheless, the proposal of the QFRG did not receive much attention neither inside nor outside the IMF (Truman, 2006a, p. 67) and was rejected by the Executive Board (Van Houtven, 2002, p. 8).

As mentioned above, the quota – as a single measure – is intended to serve multiple purposes (box 3). Kelkar et al. (2004) put forward the question whether separate measures for each objective would possibly produce better outcomes than one single parameter. Rapkin and Strand (2006), for instance, suggest linking a country’s contribution to IMF financial

resources directly to its relative, GDP-based position in the world economy. The scope of access to IMF resources should be determined by balance of payments items, e.g. the reserve position. The individual weight on voting should also be contingent on a country’s relative economic weight in the world economy, e.g. its GDP.

For the purpose of taking account of the openness of an economy, the current quota formulas incorporate current payments (imports) and current receipts (exports). When measuring these variables in the euro area, Rapkin and Strand (2006) and Kelkar et al. (2004) argue that trade within a currency union artificially enlarges the openness measure without generating the need for financial support from the IMF as the member states of a currency union would not be subject to a balance of payments crisis. However, Cooper et al. (2000) point out that the Articles of Agreement only provide for IMF membership of sovereign states and not of any other entities. The QFRG also argues that having a common currency does not preclude participating countries from encountering balance of payments difficulties of a type for which the IMF is able to provide help. When discussing this issue, the IMF Executive Board noted that the identification of balance of payments requirements would indeed be more difficult for currency unions than in the case of individual members with their own currencies; the Executive Board pointed out, however, that circumstances could arise in which – based on indicators like exceptional financing and movements in interest rate premiums – such a need could emerge (IMF, 2000). Moreover, the “no bailout” clause would make financing by

the ECB, unavailable for euro area countries.

Other reform proposals to increase the voting share for low-income countries are geared toward raising the number of basic votes. At the Bretton Woods Conference in 1944, each IMF member state was given the same number of basic votes, namely 250 (see box 4). The primary notion of this allocation of basic votes was to acknowledge the sovereign equality of member states. As mentioned above, initially basic votes accounted for 11.26% of total votes. However, as there is no automatism to sustain this ratio – although the introduction of such an automatism is currently the subject of heated discussion – the share of basic votes dropped steadily to finally reach a level of around 2% of total votes. In order to restore the original approach, proposals have been made to increase basic votes in a one-off measure and/or to define a floor of basic votes that would have to be maintained even if regular quota increases are on the agenda. The idea behind these proposals is that the influence of basic votes remains unchanged in particular for developing countries in times when quotas are raised. Critics argue that the selection of an absolute number or ratio of basic votes would be arbitrary and subject to political dispute. Not to forget that a change in the structure of basic votes would call for an amendment of the Articles of Agreement, thereby requiring a majority of 85% of votes.

Overall, there is general agreement among international policymakers that adjustments to quotas are necessary but should be equitable and objective. Under these circumstances, the discussion about, and establishment of, a new quota formula

seems to be the only way to square the circle. It is equally clear that in order to achieve its objectives, the new quota formula must show a higher proportion of quota for emerging market economies. Some countries are pushing quite strongly for attributing greater weight to GDP – possibly to the exclusion of any other indicator. It must be said quite clearly that such an approach will not lead to a shift in calculated quotas toward emerging market economies or developing countries. In fact, the contrary is true: Industrialized countries, in particular the U.S.A., would gain prominence in such a scenario. Despite the fact that some industrialized countries might voluntarily reject an increase in their quotas during the next quota review process, it cannot be guaranteed that such forbearance will happen automatically during every future quota increase discussion. Moreover, the criterion of objective and equitable quota allocations would be seriously called into doubt; in fact, it would be irrevocably breached. A better solution would be to include a set of indicators in the quota formula which reduces the calculated quota of industrial countries while increasing it for emerging market economies. An appropriate indicator in this respect might be a country's reserve position. This approach would also serve the useful purpose of increasing the financing available for the most likely type of crisis in the past decade (namely a capital account crisis) – on the assumption that countries most likely to be hit by a capital account crisis would also be those most likely to have taken the precaution of increasing their foreign exchange reserves. There are, however, other specific economic reasons that would contest the inclusion of

reserves into the new quota formula. Moreover, it might also be difficult to get political acceptance for this approach. This is doubly doubtful when considering that the European countries have already emphasized the future role of GDP and openness indicators in the new quota formula in their speeches at the 2006 Annual Meeting in Singapore.

6.2 Representation on the Executive Board: Constituencies and Chairs

Decision-making at the IMF is conducted by the Board of Governors, which consists of one representative from each member country (either the Minister of Finance or the Governor of the Central Bank), and the Executive Board, which is the primary decision-making body. In the following, we focus on the Executive Board.

The Executive Board consists of one representative from the five countries with the largest IMF quotas (currently the U.S.A., Japan, Germany, France and the United Kingdom), appointed by the respective country itself, and 19 other members that are elected by constituency groups formed by the remaining countries. These constituency groups comprise both industrialized and developing countries and usually elect their Executive Director on the basis of the highest voting share within their constituency. The position of the individual constituency group is usually formed by intra-group consultations. Western Europe accounts for eight Executive Directors, Asia for five, the Middle East and Latin/South America for three, respectively, North America and Sub-Saharan Africa each account for two Executive Directors, and Russia for

one. Recent academic research on how best to reform the IMF centered – inter alia – on questions like: Should the role of the Executive Board be strengthened (e.g. Van Houtven, 2004), should the size of the Board be increased to take account of the rising number of members, or – on the contrary – should the size be lowered or seats be reallocated to render decision-making more effective and to make the whole institution more representative (e.g. Truman, 2006b).

Some proposals aim at reducing the number of Executive Directors from the EU and raise the number of Executive Directors from African countries instead. At present, EU countries directly control 32% of the votes of the Fund. Since non-EU countries are included in EU-constituencies and EU countries are also present in non-majority EU constituencies, EU countries can potentially influence a further 12.5% of the votes. Truman (2006a) therefore concludes that the European Union is overrepresented in the IMF Executive Board. Various suggestions have been made to reshuffle EU countries' IMF membership and create a single chair for the EU and/or the European Central Bank (ECB) (e.g. Leech and Leech, 2005, or Horng, 2005). Truman (2006a) mentions that Europe would then be better able to speak with one voice and could potentially exert more influence. Currently, however, no decisive move in that direction is to be expected from European policymakers. This needs to be stressed in light of the fact that intense debates are going on at many EU/euro area bodies (Ecofin Council, ECB, European Commission) on external representation, in particular on a single euro area chair at the IMF. A thorough analysis of a possible sin-

gle European representation at the IMF is clearly beyond the scope of this paper. However, in a nutshell, it is obvious that the Euro area's "political" weight in the Fund is presently far below that of its combined actual quotas. This imbalance is attributable to the lack of effective, continual cooperation despite – or possibly because of – a plethora of coordinating bodies (EURIMF⁴ in Washington, EFC⁵, SCIMF⁶, IRC⁷, the IRC Expert Group, ECB and European Commission). A few intermittent bright spots do not change the mostly gloomy picture – a fact that is partly due to lack of enthusiasm for euro area coordination by those euro area countries which are also members of one of the Gs (G-7, G-8, G-20). Mostly, it is attributable to parochial interests which can abound since there is no absolute need to speak with one voice on the Executive Board and at the meetings of the informal bodies listed above. All of the above means that a fundamental change can be expected only when a common euro area chair is established at the Executive Board, enforcing closer cooperation due to the necessity of expressing one – coordinated – opinion at the Board and elsewhere. Smaller euro area countries with a good representation at the Board (such as Austria) are pressing for the early establishment of a single chair but have been vehemently against interim solutions (such as establishing fewer euro area constituencies) which would in all likelihood be at their cost. The problem with a single chair is that IMF membership

is confined to sovereign countries and the euro area does not have the legal status of a country. Also, the combined euro area quota would be nearly twice as high as the U.S. quota and would thus require that the Fund's seat be transferred to Europe (the Articles of Agreement specify that the IMF seat is in the member country with the largest quota). Since both facts are equally unpalatable and unacceptable for the U.S.A., a single euro area chair can only be deemed a long-term project. In principle, it could also be the U.S.A. which takes the lead in changing the structure of the Executive Board. The current number of 24 seats on the Executive Board ultimately depends on the U.S. stance, since every two years the extension from 20 (as originally foreseen in the Articles of Agreement) to 24 seats hinges on a special majority of 85% which could be blocked by the U.S.A.'s 17% voting share. A reduction to 20 seats could possibly improve the efficiency of certain procedures at the Executive Board, e.g. by shortening the reaction time between the eruption of a crisis and the implementation of measures to resolve it (in particular the establishment of a program and the provision of financing). Moreover, internal reforms, concerning for instance frictions between departments with similar portfolios or the specification of internal competences, could possibly be accomplished in a more efficient way. Competition between the Fund and other international institutions (in particular the World Bank) also needs

⁴ *Informal Group of IMF Executive Board Eurogroup Representatives.*

⁵ *Economic and Financial Committee.*

⁶ *EFC Sub-Committee on IMF and Related Issues.*

⁷ *International Relations Committee.*

to be reduced and ideally abolished. Such a move does not exclude close cooperation in areas where the work of two institutions unavoidably overlaps. All these issues could possibly be handled more easily by a leaner Executive Board. Nevertheless, a reduction to 20 seats would lead to the liquidation of the four constituencies with the smallest voting power, currently comprising 43 members who would have to join other constituencies. Moreover, the four smallest constituencies are not European constituencies. A resizing of the Executive Board to 20 would in fact increase European representation at the Fund in the first instance, although as a consequence political pressure might rapidly increase on Europe to reduce its voice and representation at the Fund.

Earlier, we argued that constituencies, which consist of a combination of industrialized and developing countries, form their opinion by intra-group consultations. Together with the weighted voting in the Executive Board, a system of consensus formation has evolved in which major decisions tend to be taken during informal negotiations rather than on the basis of formal rules. On the one hand, this consensual decision-making process might favor the participation level of developing countries (e.g. Van Houtven, 2002), but on the other hand it reduces the transparency and accountability of the IMF. Informal negotiations might tend to be for the benefit of those countries that are able to buttress their initiatives or policy preferences with greater voting power (Woods, 1999). Therefore, it is often argued that it is the Executive Directors from the G-7 who retain the real power within the decision-making process.

A related issue that is often raised in the literature is the appearance of special majorities in the decision-making process, which would discriminate against developing countries. In the past, as a consequence of political tradeoffs, the Articles of Agreement have been amended on several occasions to increase the number of decisions requiring special majorities; a strict coherent and logical framework for special majorities is lacking, however. Therefore, Rapkin and Strand (2006) propose to rationalize the current special majority provisions. They also raise the issue of U.S. dominance, arguing that the U.S.A. exert a disproportionately strong influence on the IMF not only through its large voting share, its seat in the Executive Board, the large proportion in the IMF staff of U.S. citizens and/or staff members trained at U.S. universities, but also through the direct transmission of U.S. concerns to the IMF management/staff and to individual members. This phenomenon is called the “Treasury effect” (see also Evans and Finnemore, 2001). A possible solution to avoid the dominance of one country would be to set the special majorities just beyond a country’s total vote or to wait – in the case of the U.S.A. – until the voting share falls below 15%, and to refuse to raise the threshold for special majority voting to above 85%. Nevertheless, the obvious dominance – in terms of quotas and voting shares – of industrialized countries in the Executive Board does not imply that developing countries have been manipulated or treated in an unfair way. Rapkin and Strand (2006) argue that the wedge between the actual and the calculated quotas can largely be attributed to repeated attempts to provide higher quotas and

more voting rights to smaller and poorer members.

It is clear that reform proposals that aim at a formal amendment of the Articles of Agreement might face political opposition in the beginning. Note that in the past developing countries have taken recourse to IMF resources to a larger extent than industrialized countries. No industrialized country has asked the IMF for financial resources since 1978. Industrial countries, which contribute more to IMF resources and dominate rule-making, act as creditors, while less developed countries, which contribute less to IMF resources, primarily act as debtors. Therefore, industrialized countries could hesitate to pave the way toward increasing the influence of developing countries on IMF operations, maintaining that giving more control over the institution to the borrowers could undermine the global financial system's confidence in the IMF.

7 Conclusions

At its Annual Meeting in Singapore in September 2006 (IMF, 2006d), the IMF recognized that the quota of four countries – China, Korea, Mexico and Turkey – had to be raised on an ad-hoc basis. The quotas of these four countries were raised by 1.8% of total current quotas. China, Korea, Mexico and Turkey were the only countries that were underrepresented both on the basis of the five existing quota formulas and on the basis of all four variables that are currently used in these formulas. Moreover, the Executive Board will work on a new quota formula which should be completed no later than by the spring 2008 meeting of the International Monetary and Financial Committee (IMFC). The new quota for-

mula should give significantly higher weight to GDP while ensuring that the other variables, in particular the openness of members' economies, will also play an important role. On the basis of the new formula, the Board of Governors will decide on further quota increases no later than by the 2008 Annual Meeting for those countries that have requested that their quotas be increased with a view to achieving a further alignment that takes the individual countries' relative positions in the world economy into account. Furthermore, the Executive Board has been requested to make a proposal for a doubling – at least – of basic votes for each member and to ensure that the ratio of the sum of basic votes to the overall sum of votes will remain constant in the event of any further changes in members' total voting power.

In addition, the IMFC agreed on an increase in staff resources for those constituencies that have to deal with a heavy workload. Furthermore, the two African Executive Directors, who represent 43 countries, may also appoint a second Alternate Executive Director.

Considering this resolution and further reports by the Managing Director, a reform of the IMF is well under way. The IMF recognized that IMF surveillance should put greater weight on analyzing and discussing global economic issues. By taking account of international spillovers, surveillance should in future be multilateral rather than purely country-specific. Exchange rates and policies should also be the focus of renewed interest. Whether the IMF will have the actual power and ability to effectively cope with this expanded role remains to be seen.

There is no doubt that IMF quotas will have to be adjusted to take account of the changing economic weight of many member countries in the world economy. As mentioned above, negotiations on a new quota formula started after the 2006 Annual Meeting in Singapore. Low income countries should be given more basic votes in order to prevent the IMF from losing legitimacy. However, with the IMF's intention to put greater weight on GDP in the new quota formula the stage is set for complex, difficult and time-consuming negotiations.

The IMF should furthermore streamline existing procedures for providing assistance to emerging market economies by increasing existing credit-lines. Currently these procedures are still prone to internal and external vulnerabilities. Instead of introducing new facilities, the easiest option would be to increase their quotas.

As far as Europe is concerned, and in light of the fact that it is unlikely that a single euro area chair on

the IMF's Executive Board will be established any time soon, closer coordination and a better focus on the issues on the Executive Board's agenda by all the various groups and forums tasked to follow IMF issues will be essential.

Finally, the IMF will need to reform its financing system and budgeting procedures to ensure that expenditures will be adequately curtailed to enable the Fund to work efficiently despite income shortfalls, which might well be not transitory but of a permanent nature.

The fact that for sixty years the IMF has been able to change with the times and the sometimes violent shift of the international monetary and financial system all the while coping with new tasks while keeping its core functions intact and relevant allows considerable scope for optimism that it will continue to weather present and future crises – both institutionally, for its own sake, and externally, for the benefit of the international financial and monetary system.

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NOTES

Abbreviations

ARTIS	Austrian Real Time Interbank Settlement (the Austrian RTGS system)	IHS	Institut für Höhere Studien und Wissenschaftliche Forschung – Institute for Advanced Studies, Vienna
A-SIT	Secure Information Technology Center – Austria	IIF	Institute of International Finance
ASVG	Allgemeines Sozialversicherungsgesetz – General Social Security Act	IIP	international investment position
A-Trust	A-Trust Gesellschaft für Sicherheitssysteme im elektronischen Datenverkehr GmbH	IMF	International Monetary Fund
ATX	Austrian Traded Index	ISO	International Organization for Standardization
BCBS	Basel Committee on Banking Supervision (BIS)	IWI	Industriewissenschaftliches Institut – Austrian Institute for Industrial Research
BIC	Bank Identifier Code	JVI	Joint Vienna Institute
BIS	Bank for International Settlements	LIBOR	London Interbank Offered Rate
BOP	balance of payments	M3	broad monetary aggregate M3
BSC	Banking Supervision Committee (ESCB)	MFI	monetary financial institution
CACs	collective action clauses	MRO	main refinancing operation
CEBS	Committee of European Banking Supervisors (EU)	MoU	memorandum of understanding
CEE	Central and Eastern Europe	NACE	Statistical Classification of Economic Activities in the European Community
CEECs	Central and Eastern European countries	NCB	national central bank
CESR	Committee of European Securities Regulators	OeBS	Oesterreichische Banknoten- und Sicherheitsdruck GmbH – Austrian Banknote and Security Printing Works
CIS	Commonwealth of Independent States	OECD	Organisation for Economic Co-operation and Development
CPI	consumer price index	OeKB	Oesterreichische Kontrollbank (Austria's main financial and information service provider for the export industry and the capital market)
EBA	Euro Banking Association	OeNB	Oesterreichische Nationalbank (Austria's central bank)
EBRD	European Bank for Reconstruction and Development	OPEC	Organization of the Petroleum Exporting Countries
EC	European Community	ÖBFA	Austrian Federal Financing Agency
ECB	European Central Bank	ÖNACE	Austrian Statistical Classification of Economic Activities
Ecofin	Council of Economic and Finance Ministers (EU)	POS	point of sale
EEA	European Economic Area	PRGF	Poverty Reduction and Growth Facility (IMF)
EFC	Economic and Financial Committee (EU)	RTGS	Real-Time Gross Settlement
EIB	European Investment Bank	SDR	Special Drawing Right (IMF)
EMS	European Monetary System	SDRM	Sovereign Debt Restructuring Mechanism (IMF)
EMU	Economic and Monetary Union	SEPA	Single Euro Payments Area
EONIA	Euro OverNight Index Average	SPF	Survey of Professional Forecasters
ERM II	Exchange Rate Mechanism II (EU)	STEP2	Straight-Through Euro Processing system offered by the Euro Banking Association
ERP	European Recovery Program	STUZZA	Studiengesellschaft für Zusammenarbeit im Zahlungsverkehr G.m.b.H. – Austrian Research Association for Payment Cooperation
ESA	European System of Accounts	S.W.I.F.T.	Society for Worldwide Interbank Financial Telecommunication
ESAF	Enhanced Structural Adjustment Facility (IMF)	TARGET	Trans-European Automated Real-time Gross settlement Express Transfer
ESCB	European System of Central Banks	Treaty	refers to the Treaty establishing the European Community
ESRI	Economic and Social Research Institute	UNCTAD	United Nations Conference on Trade and Development
EU	European Union	UNO	United Nations Organization
EURIBOR	Euro Interbank Offered Rate	VaR	Value at Risk
Eurostat	Statistical Office of the European Communities	WBI	Wiener Börse Index
FATF	Financial Action Task Force on Money Laundering	WEF	World Economic Forum
Fed	Federal Reserve System	WIFO	Österreichisches Institut für Wirtschaftsforschung – Austrian Institute of Economic Research
FMA	Financial Market Authority (for Austria)	WIIW	Wiener Institut für internationale Wirtschaftsvergleiche – The Vienna Institute for International Economic Studies
FOMC	Federal Open Market Committee (U.S.A.)	WKO	Wirtschaftskammer Österreich – Austrian Federal Economic Chamber
FSAP	Financial Sector Assessment Program (IMF)	WTO	World Trade Organization
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		
GNP	gross national product		
GSA	GELDSERVICE AUSTRIA Logistik für Wertgestionierung und Transportkoordination GmbH (Austrian cash services company)		
HICP	Harmonized Index of Consumer Prices		
HIPC	Heavily Indebted Poor Countries		
IBAN	International Bank Account Number		
IBRD	International Bank for Reconstruction and Development		
ICT	information and communication technology		
IDB	Inter-American Development Bank		
IFES	Institut für empirische Sozialforschung GesmbH (Institute for Empirical Social Research, Vienna)		
ifo	ifo Institute for Economic Research, Munich		

Legend

- x = No data can be indicated for technical reasons
- .. = Data not available at the reporting date
- 0 = The numerical value is zero or smaller than half of the unit indicated

Discrepancies may arise from rounding.

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This quarterly publication, issued both in German and English, offers analyses of current cyclical developments, medium-term macroeconomic forecasts and studies on central banking and economic policy topics. It also summarizes the findings of macroeconomic workshops and conferences organized by the OeNB.

Statistiken – Daten & Analysen

quarterly

This publication contains brief reports and analyses focusing on Austrian financial institutions, cross-border transactions and positions as well as financial flows. The contributions are in German, with executive summaries of the analyses in English. The statistical part covers tables and explanatory notes on a wide range of macroeconomic and financial indicators. The tables and additional information and data are also available on the OeNB's website in both German and English. This series also includes special issues on selected statistics topics published at irregular intervals.

econ.newsletter

quarterly

The quarterly English-language newsletter is published only on the Internet and informs an international readership about selected findings, research topics and activities of the OeNB's Economic Analysis and Research Section. 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 current publications, studies or working papers as well as events (conferences, lectures and workshops).

For further details see www.oenb.at/econ.newsletter

Financial Stability Report

semiannual

Issued both in German and English, the *Financial Stability Report* contains first, a regular analysis of Austrian and international developments with an impact on financial stability and second, studies designed to provide in-depth insights into specific topics related to financial market stability.

Focus on European Economic Integration semiannual

The English-language publication *Focus on European Economic Integration* is the successor publication to *Focus on Transition* (published up to issue 2/2003). Reflecting a strategic regional research priority of the OeNB, this publication is a channel for communicating our ongoing research on Central and Eastern European countries (CEECs) as well as Southeastern European (SEE) countries ranging from economic country studies to studies on central banking issues and related topics. One of the purposes of publishing theoretical and empirical studies in the *Focus on European Economic Integration*, which are subject to an external refereeing process, is to stimulate comments and suggestions prior to possible publication in academic journals.

**Workshops –
Proceedings of OeNB Workshops** three to four issues a year

The *Proceedings of OeNB Workshops* were introduced in 2004 and typically 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.

Working Papers about ten papers a year

The OeNB's *Working Paper* series is designed to disseminate, and provide a platform for discussing, findings 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.

Economics Conference (Conference Proceedings) annual

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

**Conference on European Economic Integration
(Conference Proceedings)** annual

This series, published in English by a renowned international publishing house, reflects presentations made at the OeNB's annual conference on Central, Eastern and Southeastern European issues and the ongoing EU enlargement process (formerly East-West Conference).

For further details see ceec.oenb.at

Annual Report

annual

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

Intellectual Capital Report

annual

The *Intellectual Capital Report* has been published since 2003 as a review of the OeNB's intellectual capital and its use in the OeNB's business processes and services. The report provides an integrated view of the strategically important management of human, relational, structural and innovation capital; it clarifies the relationships between different types of capital and describes various determinants that influence the OeNB's intellectual capital. The findings of the report serve to assess the consistency of the OeNB's intellectual capital with its knowledge-based strategic orientation.

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