

MONETARY POLICY & THE ECONOMY

Quarterly Review of Economic Policy

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Opinions expressed by the authors of studies do not necessarily reflect the official viewpoint of the Oesterreichische Nationalbank or of the Eurosystem.

Analyses

Edging Out of Recession

Gerhard Fenz,
Wolfgang Pointner,
Josef Schreiner¹

The global slowdown appears to have come to an end during the summer of 2009. Most countries saw a smaller decline in economic activity in the second quarter, with some economies even recording positive growth rates once again.

In the U.S.A., the economic contraction moderated in the second quarter of 2009, with the government's economic stimulus packages and net exports making positive contributions to GDP growth, and the negative contribution from investment decreasing significantly vis-à-vis the previous quarter. With the household saving rate rising sharply, private consumption is making a negative contribution to growth. Although this development may help to reduce global imbalances, it could dampen the recovery in the U.S.A.

In the euro area, too, there are signs of a gradual improvement, with GDP declining by a mere 0.1% quarter on quarter in the second quarter of 2009. This growth was underpinned not only by a strong positive contribution from net exports, but also consumption. The likelihood of a further increase in consumption, however, is uncertain, as the labor market situation is set to deteriorate and because consumer demand has recently been bolstered by fiscal stimulus packages that were only temporary. Investment remained weak, as capacity utilization was extremely low. Current forecasts predict a gradual recovery in the euro area economy.

In the summer of 2009, euro area inflation bottomed out, with the HICP falling by 0.7% in July. This was due primarily to base effects stemming from commodity prices. The latest forecasts predict that there will be no risks to price stability until the end of 2010.

The Central, Eastern and Southeastern European countries also recorded considerable declines in GDP growth in the first half of 2009. However, the stabilization of the financial markets, as well as leading indicators, suggest that there will be an improvement over the rest of the year. In many countries, the recession brought about reductions in current account deficits.

After posting negative growth rates for four consecutive quarters, the Austrian economy is set to pick up again in the second half of 2009, mainly on the back of improved external conditions, fiscal stimulus packages and inventory cycle developments. The OeNB's latest short-term indicator results show real GDP growth at 0.4% in both the third and fourth quarters of 2009 (seasonally and working day-adjusted, on a quarterly basis). Owing to the sharp slump recorded at the beginning of the year, a 3.6% contraction is forecast for the full year 2009.

JEL classification: E2, E3, O1

Keywords: global outlook, euro area, central and (south-)eastern Europe, Austria

1 Global Recovery on Shaky Foundations

1.1 U.S.A.: Pace of the Downturn Eases Significantly

In the second quarter of 2009, the downturn in the U.S. economy slowed considerably. Annualized quarterly real GDP growth fell by only -0.7% , after having been deep in negative territory for the previous three quarters. This improvement was due to a moderation in the decline in investment and the

pace of destocking. Growth was also bolstered by government investment and net exports. Despite having recovered marginally in the first quarter of 2009, private consumption dropped slightly again in the second quarter: Whereas the massive fiscal stimulus packages triggered an increase in real disposable household income notwithstanding the fall in GDP, households used the extra income to bolster their savings, thus pushing the saving rate up

Cutoff date for data:
October 1, 2009

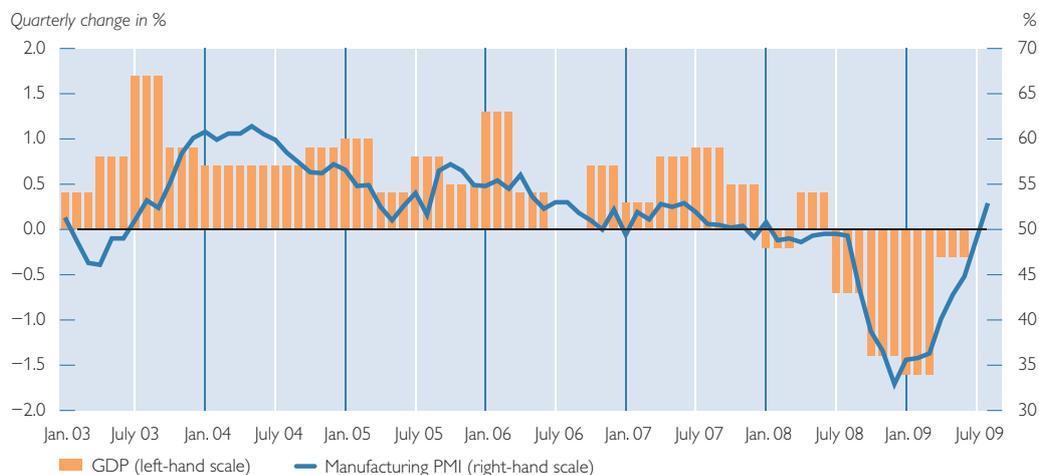
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to 5.2% in the second quarter of 2009 (after 1.2% at the beginning of 2008). This reflects households' need to consolidate their finances. In August 2009, the U.S.A. also allocated USD 3 billion to a car scrapping incentive for motorists to buy new cars (Cash for Clunkers), which is expected to further boost consumption in the second half of 2009. The fragility of private consumption is highlighted, among other things, by the strong volatility in consumer confidence, which rose considerably in April and May 2009, fell in June and July and shot up once again in August. The level of consumer confidence remains relatively low. Although the sharp declines in retail sales recorded in 2008 may well be over, there is unlikely to be a marked recovery in the near future, owing to the ongoing tensions in the labor market. In September 2009, the unemployment rate rose to 9.8%, reaching its highest level since June 1983 and more than doubling since falling to its lowest level in 2007. Most forecasts predict a further increase to over 10%. Since the recession started at the end of 2007, almost seven million jobs have been lost.

Leading indicators of economic activity also suggest that the U.S.A. is on its way out of recession, with the composite leading indicator of The Conference Board research institute rising for the fourth time in a row in July 2009. Orders for consumer durables shot up unexpectedly in July. At 52.6 in September, the Purchasing Managers' Index for the manufacturing sector exceeded the threshold value of 50 for the second time since the end of 2007, thus signaling an upcoming acceleration in economic activity. The Purchasing Managers' Index for the service sector also improved in September 2009, outpacing the threshold value of 50 for the first time since May 2008. There has also recently been positive news on the U.S. residential real estate market, with tax incentives for homebuyers in particular being expected to contribute to a recovery in this market. In June 2009, the Case-Shiller Index of home prices in the U.S.A. rose for the first time in approximately three years. The revival of the housing market is essential for a sustainable recovery of the financial system and in turn the entire U.S. economy. By contrast, the com-

Chart 1

U.S.A.: Purchasing Managers' Index (PMI) and GDP Growth



Source: Institute for Supply Management (ISM), Bureau of Economic Analysis (BEA).

mercial real estate market is seeing a weaker recovery, with the number of empty business, office and industrial premises on the rise. A further indication that the end of the recession is nigh is the sharp 6.6% quarter-on-quarter increase in productivity in the second quarter of 2009. Companies reduced both their workforces and real wages in order to reduce unit labor costs and boost profit margins.

In the second quarter of 2009 – as in the first quarter – corporate profits in the U.S.A. rose by 5% on the previous quarter, but were nevertheless almost 11% lower than one year earlier. More than half of the increase was attributable to the financial sector, with central bank profits being a key factor. With regard to nonfinancial corporations, the pickup in profits was due primarily to the sharper decrease in labor costs on the back of the decline in value added. Wage costs were recently down 6% on the previous year.

At its last meeting on September 22 to 23, 2009, the Federal Reserve left the Federal Funds Rate unchanged; it intends to leave it at this low level for an extended period. In addition to the interest rate decision, the Federal Reserve also took the decision to extend its program to purchase mortgage-backed securities, a measure launched at the height of the financial crisis. The purchases, for an amount of USD 1,250 billion, are now to be executed by the end of the first quarter of 2010.

In August 2009, the CPI fell by 1.5% on the previous quarter – the sixth decline in a row – while the core rate rose by a moderate 1.4% in the same month.

Forecasts by the nonpartisan Congressional Budget Office show the U.S. budget deficit for the current fiscal year (ending on September 30, 2009) to be USD 1,600 billion or approximately

11.2% of GDP, which equals approximately three and a half times the previous year's deficit of USD 459 billion. The government's longer-term forecast for 2019 was revised upward to USD 9,000 billion (up by USD 2,000 billion on the spring forecast) as a result of the deeper-than-expected recession, the recession-related economic stimulus packages and support measures for the banking system, and the additional expenditure on the government health and pension insurance scheme owing to demographic trends. Accordingly, U.S. government debt would rise from 54% of GDP in 2009 to 68% in 2019.

The Federal Reserve expects the economy to recover gradually in the second half of 2009. It holds the view that although the risks have subsided, the economy remains vulnerable to negative shocks. In its latest forecast, the OECD expects GDP to contract by 2.8% in 2009 and to grow slightly by almost 1% in 2010.

The financial market crisis has led to a partial reduction in global imbalances. For example, the U.S. current account deficit halved from its 50-year high of 6% of GDP in 2006 to 2.9% in the first quarter of 2009, and the IMF expects it to amount to 2.6% for the full year 2009. This marked decline can be attributed, in particular, to the sharp rise in private saving (by households and companies) of almost 15 percentage points of GDP between 2006 and 2009. By contrast, public borrowing went up by approximately 12% of GDP over the same period.

1.2 Japan: Return to Economic Growth

Having contracted for four consecutive quarters, Japan's economy grew again in the second quarter of 2009, rising by 0.9% (3.7% annualized). This growth was driven primarily by exports (above

all to Asia) and by government investment programs, while private investment continued to decline rapidly. Private consumption went up by 0.8%, mainly on the back of the government's economic stimulus packages, which consisted of direct payments, as well as incentives to buy cars, electronic goods and household appliances, and are thus likely to have triggered a spate of buying. A similar level of growth is expected for the third quarter of 2009, but the outlook thereafter remains highly uncertain, especially since salaries are falling and the unemployment rate is rising further.

A government survey of corporates suggests that there has been a marked improvement in business sentiment, with above all companies in the automotive and in the electrical and optical equipment sector benefiting from the government measures. Consequently, the latest Tankan Report of October 1, 2009, which serves as Japan's most important economic indicator, also revealed a powerful increase in business confidence.

For the time being, the Bank of Japan (BoJ) plans to maintain a zero-rate policy and ample liquidity conditions, extending the most important of the programs launched during the crisis until the end of 2009. The financing situation of smaller firms remains difficult. Furthermore, the pace of the decline in prices continued to accelerate, standing at -2.2% in August. Nevertheless, the BoJ is not anticipating a deflationary downward spiral, as inflation expectations are stable.

Following the victory of the Democratic Party of Japan, the yen rallied. This strengthening of the yen is being seen as a way to boost domestic demand. The financial markets are unsure, however, that the new government will be able to fulfill its election

pledges without a further increase in government debt. These pledges include an increase in child-care benefits, income support for farmers and the abolition of highway tolls. Many companies are worried about the cost of the undertaking to reduce carbon dioxide emissions by 25% below 1990 levels by 2020 and to introduce an emissions trading system.

1.3 Positive News from China Continues

For China, it appears that the global recession is already a thing of the past. The extensive stimulus measures, as well as the loose lending policies of most state banks, are clearly working. In the second quarter of 2009, GDP growth was back up to 7.9% and has already been predicted to reach 9% in the third quarter. In August 2009, industrial production stood 12% higher than a year earlier, retail sales 17%. The Purchasing Managers' Index has exceeded the threshold value of 50 since March 2009 and recently edged up slightly further. Consumer confidence, however, is recovering only slowly, after plummeting in late 2008 and early 2009. The decline in consumer prices bottomed out at -1.7% in July 2009, with inflation reentering positive territory in August at 1.2%.

Year on year, China's high current account surplus fell by one-third in the first half of 2009, but nevertheless amounted to 6.3% of GDP. This decrease stemmed primarily from a slowdown in external demand. In recent months, China's imports, including those from the EU and Japan, have risen once again, though it is still too early to take this as an indication that China is focusing more on its domestic economy. However, the higher the level of China's imports, the more likely it will be that China will

assume a leading role in the recovery of the global economy.

At 18% of GDP, China's government debt is extremely low by international standards. In the first half of 2009, government revenues fell by 2.4% on the previous year owing to lower corporate tax revenues. The very high levels of public expenditure during 2009 will lead to a deterioration in government debt and the budget deficit. The People's Bank of China reacted to the crisis relatively late, implementing two interest rate cuts amounting to 1.35 percentage points in total. The interest rate level has remained at a low level since the beginning of 2009. By June 2009, China's new loans had surpassed the planned volume of USD 500 billion by 50%. However, the credit expansion, which started at the beginning of 2008, has not only triggered investment but will also bring about an increase in irrecoverable assets.

2 Stabilization in the Euro Area Economy

2.1 GDP Growth Falls Only Slightly in the Second Quarter of 2009

Having slumped by 2.5% quarter-on-quarter in the first quarter of 2009, euro area GDP growth came to only -0.1% in the second quarter. A significant contributing factor to this slowdown in the rate of contraction was the performance of net exports, as imports fell more markedly than exports during the second quarter. Overall, foreign trade saw a leveling off in the slump in demand: in the first quarter of 2009, exports contracted by 8.8% and imports by 7.8%, while in the second quarter, exports fell by only 1.1% and imports by 2.8%. This easing also reflects a certain degree of stabilization in the global economy.

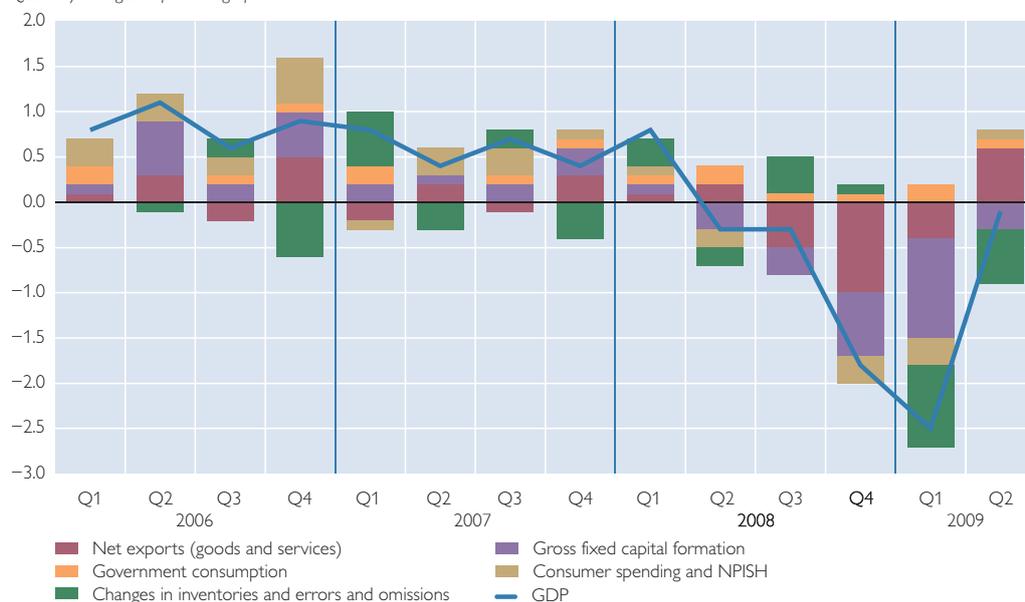
In addition to the contribution from net exports, there were positive growth stimuli from private and public consumption. Despite the deterioration in the labor market situation and the associated greater uncertainty of households about disposable income, private consumption went up by 0.2% in the second quarter of 2009, most likely largely because of the fiscal incentives introduced in many euro area countries. Countries that offered subsidies for new, more environmentally friendly cars, for example, recorded a sharp increase in car sales. Retail sales continued to fall in the second quarter of 2009; however, here too, there is likely to have been some substitution in consumer purchasing decisions. As the car scrapping incentives temporarily brought about a significant dip in the relative prices of cars, households probably eased back on their purchases in other areas, e.g. other durable goods. Since the majority of such schemes have already come to an end, car sales are likely to decline sharply over the coming months.

Investment fell further in the second quarter of 2009, namely by 1.3%. According to a survey carried out by the European Commission, companies' capacity utilization hit a record low in the second quarter of 2009, which was accompanied by a corresponding drop in investment demand. Weak demand for goods on account of the recession is also curbing investment, with tight financing conditions also having a limiting effect on the supply side. Given that surveys suggest that capacity utilization will fall slightly further in the third quarter of 2009 and that there are no signs of a rapid increase in euro area demand, a substantial rise in investment activity is not in the cards.

Chart 2

Contribution to Real GDP Growth in the Euro Area

Quarterly changes in percentage points and in %



Source: Eurostat.

Changes in inventories are following a pattern that is typical for the current economic situation. At the start of the recession, businesses were caught unawares by the extent of the slump in demand and consequently built up unwanted inventories of goods in the second half of 2008. These inventories were increasingly reduced during the first and second quarters of 2009, which had a dampening effect on GDP growth.

From a country perspective, Germany and France in particular posted surprise quarter-on-quarter increases in GDP growth in the second quarter of 2009 coming to +0.3% in each case. In Germany, positive contributions to growth came from private consumption and net exports, with exports contracting by only 1.2% in the second quarter compared with 10.5% in the first quarter. In France, exports went up by as much as 1% in the second quarter of 2009. Spain, however, recorded a 1.1% decrease in GDP over

the same period, as its economy is also suffering from the restructuring in the construction sector.

2.2 Leading Indicators Point to Moderate Growth

Industrial production stagnated in the months up to July 2009, when it fell by 0.3% month on month. Industrial new orders recovered over the same period, rising from May onwards to stand 6% higher in July than in April. Nevertheless, both indicators stood clearly below their levels in previous years. The construction output index fell further in July 2009, to the level it had reached in 1999.

All confidence indicators based on survey data have improved since April 2009. The Purchasing Managers' Index for industry has risen particularly sharply, reaching 49.3 points in September. Having hit its historic low in November 2008, the Purchasing Managers' Index posted the most powerful increases in May and July 2009.

The European Commission's Economic Sentiment Indicator also rose in September 2009, but nevertheless was still more than one and a half times its standard deviation below its long-term average. The increase was broad-based, stemming from all sectors except the retail sector. In France and the Netherlands, it went up considerably, but in Germany only marginally. In Spain and Italy, it fell once more in September 2009, after having risen in the previous month.

The Ifo Business Climate Index rose in September 2009 for the sixth time in a row, with businesses reporting an improvement in business conditions. The surveyed businesses reported improvements not only in the current situation but also in expectations. The majority, however, still assess the situation as poor. With regard to expectations for the next six months, the pessimists and the optimists are equal in number.

2.3 Labor Market Situation Deteriorates

With the usual lag, the financial crisis gradually penetrated the labor market too. In August 2009, euro area unemployment stood at 9.6%, up two percentage points from the previous year. The increase in unemployment was particularly pronounced in those countries plagued not only by the consequences of the international financial market crisis, but also by the restructuring in their construction sectors. Over the past 12 months, the unemployment rate in Ireland more than doubled (from 6% in July 2008 to 12.5% in July 2009) and in Spain it climbed from 11.4% to 18.5% over the same period.

In Germany, unemployment rose by only 0.5 percentage points year on year, to 7.7%. This can be attributed partly to the expansion of short-time

working arrangements – the German government has extended the entitlement period for short-time working benefits from 12 to 18 months. Federal Employment Agency estimates reveal that there were 1.4 million people working shorter hours in July 2009.

According to the IMF forecast published on October 1, 2009, euro area unemployment will stand at 9.9% in 2009 and rise to 11.7% in 2010.

2.4 Forecasts Suggest a Gradual Recovery

The latest available forecasts predict a further improvement over the next few quarters. For 2009, GDP growth rates are predicted to be 4%, which is an improvement on the last forecasting round over the summer. This revision is due mainly to GDP growth during the second quarter, which was higher than predicted in earlier forecasts. According to the ECB staff projections, which are based on the information available up to August 21, 2009, GDP growth is projected to be between -4.4% and -3.8% in 2009 and between -0.5% and +0.9% in 2010. The recovery will depend primarily on an assumed increase in export demand and on whether the fiscal stimulus measures also boost domestic demand. In this regard, however, it should be noted that although the fiscal stimulus measures may bolster the upturn on a temporary basis, it is unlikely that they will have a lasting effect.

According to the IMF forecast published on October 1, 2009, GDP growth will stand at -4.2% in 2009 and at 0.3% in 2010. The IMF therefore also expects a somewhat more gradual recovery, continuing to cite tight bank lending conditions and rising unemployment as the main reasons for the weak growth.

2.5 Decline in Prices Bottoms Out

Falling by 0.7%, consumer prices recorded their largest year-on-year decline in July 2009. The following month, the HICP dropped by only 0.2%. The decline in HICP inflation over the summer was broadly in line with expectations, primarily reflecting base effects stemming from fluctuations in global commodity prices. The sign of the energy price base effect reversed in August 2009, with the result that the contribution of the energy component to inflation will increase over the coming months.

On the back of a downward base effect, energy prices fell by 10.2% year on year in August 2009, with sharp declines particularly in the prices of transport fuel, heating fuel and gas. However, the prices of the other energy components, e.g. electricity prices, also decreased.

The rally in the price of crude oil that had begun in March 2009 temporarily came to a halt in July. However, during August, crude oil prices started to rise again. Oil prices were subject to marked volatility stemming from geopolitical tensions, production shortfalls and uncertainty about a rapid, sustained recovery of the global economy.

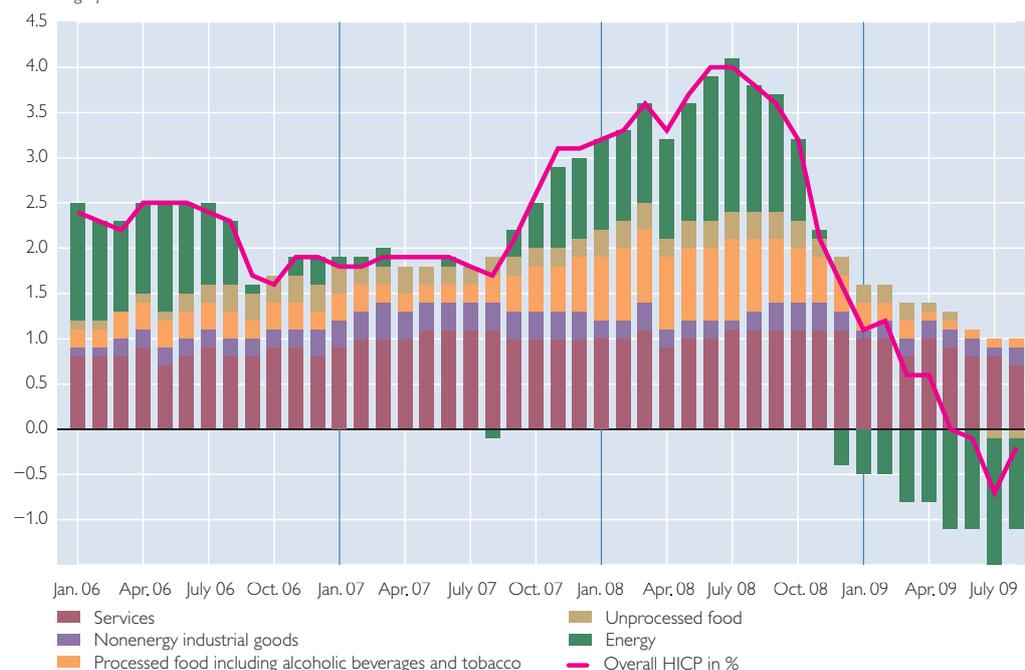
In June 2009, food prices remained unchanged for the first time in a long time. The slight positive contribution from processed food was canceled out by a negative contribution from unprocessed food. Despite the ebbing of the favorable base effect of the summer of 2009, food prices may fall further over the coming months according to leading indicators.

With the further normalization of the inflation-linked bond markets, the break-even inflation rate (BEIR) can be more easily interpreted. The current

Chart 3

HICP Components

Percentage points and %



Source: Eurostat.

term structure of both the BEIR and inflation-linked swaps suggests that despite some normalization since the crash in the fall of 2008, short-term inflation expectations are still significantly below the Eurosystem's inflation target. Long-term expectations (five-year forward five years ahead BEIR) remain at a level in line with the definition of price stability. Since April 2009, the exchange rate of the U.S. dollar against the euro has risen, and since June the pound sterling has also strengthened, although in recent weeks the appreciation of the euro against the pound sterling has been stronger. On September 24, 2009, the USD/EUR exchange rate stood at 1.48, while the exchange rates of the Japanese yen and Swiss franc against the euro remained unchanged. The nominal effective exchange rate of the euro has also risen since the beginning of September 2009, after having been relatively stable over the summer.

According to the ECB staff projections, average annual HICP inflation is expected to fall to between 0.2% and 0.6% in 2009, reflecting base effects stemming from past hikes in commodity prices. For 2010, an inflation rate of between 0.8% and 1.6% is expected. There is therefore no risk to price stability over the entire forecasting horizon.

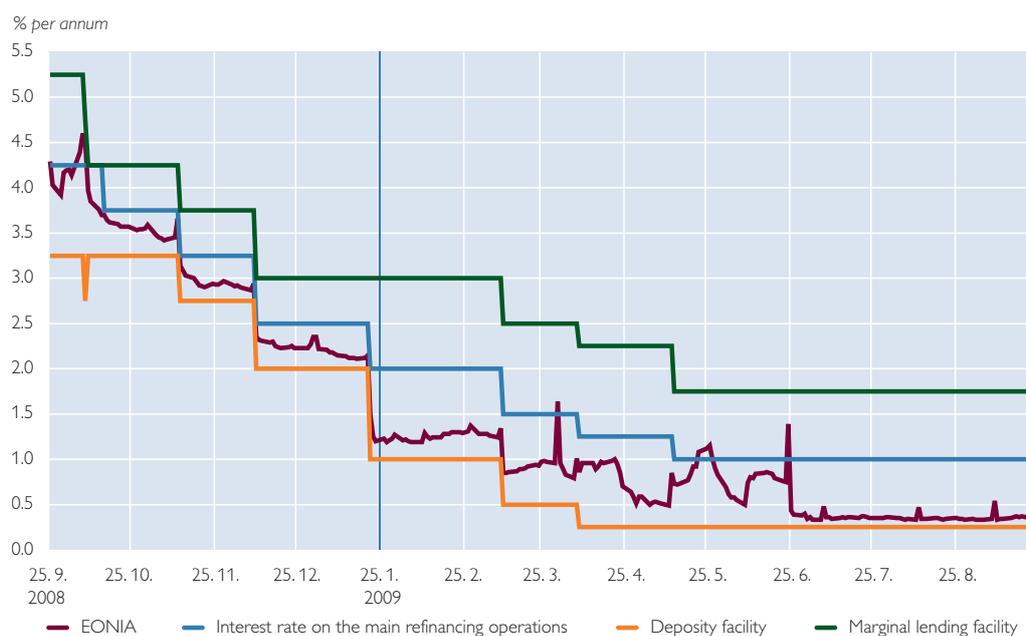
2.6 Interest Rates Remain at a Low Level

At its meeting on September 3, 2009, the Governing Council of the ECB decided to leave the interest rate on the main refinancing operations of the Eurosystem, as well as the interest rates on the marginal lending facility and the deposit facility, unchanged at 1.00%, 1.75% and 0.25%, respectively.

It also decided that the interest rate for the 12-month longer-term refinancing operation that was allotted on September 30, 2009, would be the prevail-

Chart 4

Money Market Rates and ECB Interest Rates



Source: Thomson Reuters.

ing rate on the main refinancing operations. This decision, which facilitated continued liquidity support to the banking system of the euro area for an extended period at very favorable conditions, should promote the extension of credit to the euro area economy and thus further underpin its recovery.

On September 29, 2009, the Euro Overnight Index Average (EONIA) stood at 0.35%. Since the first longer-term refinancing operation with a maturity of one year was settled on June 25, 2009, the EONIA has hovered around a lower level than before, with lower volatility too. In the ten-year segment, the yield spreads between government bonds in Germany and other euro area countries have narrowed slightly, although long-term government bond yields have risen marginally in Germany.

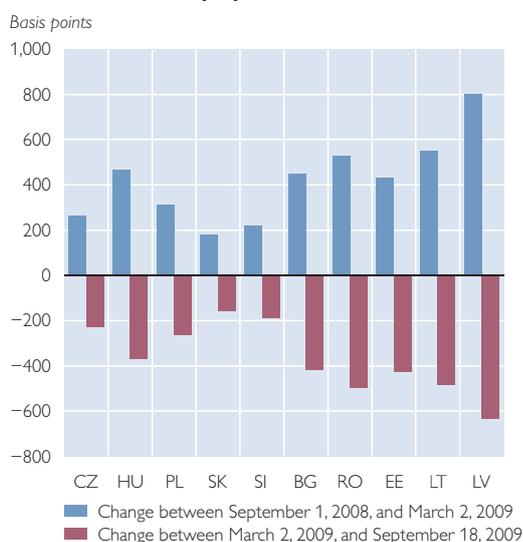
Over the last few months, M3 growth has declined considerably, down from 8.9% in August 2008 to a mere 2.5% in August 2009. This development was due to the extremely low

levels of short-term interest rates. On the one hand, fixed-term deposits, which had attractive interest rates up to the summer of 2008 and constituted major contributing factors to M3 growth, became less appealing compared with demand deposits, with the annual growth rate of fixed deposits consequently falling from 13.6% in December 2008 to -4.1% in August 2009. On the other hand, there were also noticeable portfolio shifts from marketable financial instruments, which are not covered by a government guarantee, into liquid assets that are subject to such a guarantee. As a result, the growth rate of marketable instruments has been negative for several months, standing at -10% in August 2009. Overall, the decline in M3 growth can be attributed to weaker contributions from fixed-term deposits and marketable financial instruments. These developments have had a positive impact on the more liquid components of M3, in particular demand deposits. In August 2008, M1 growth hit a low of

Chart 5

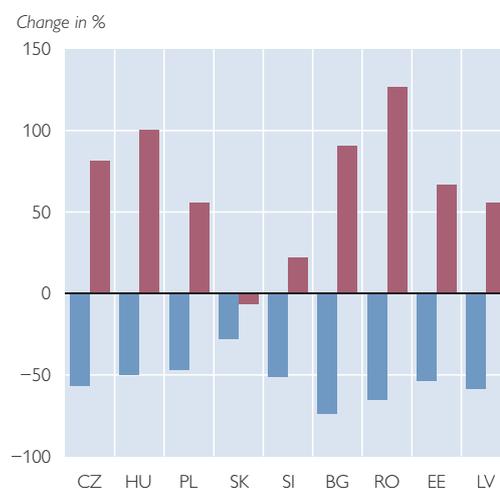
Development of Selected Financial Market Indicators

Credit Default Swap Spreads



Source: Thomson Reuters.

Stock Price Indices



0.2%, but by August 2009 it had risen to 13.6%.

3 Economic Developments in Central, Eastern and South-eastern Europe

3.1 Financial Markets Show Improvement During the Second and Third Quarters of 2009

The financial market situation in the countries of Central, Eastern and Southeastern Europe (CESEE) improved considerably during the second and third quarters of 2009, bolstered by returning confidence and a growing appetite for risk on the international financial markets. The intense stabilization action carried out by international financial organizations and the EU played a crucial role in this development. The recovery was evident in all financial market segments, in particular credit default swap spreads, Eurobonds and stock markets. Despite these improvements, most countries have not yet seen a return to precrisis levels.

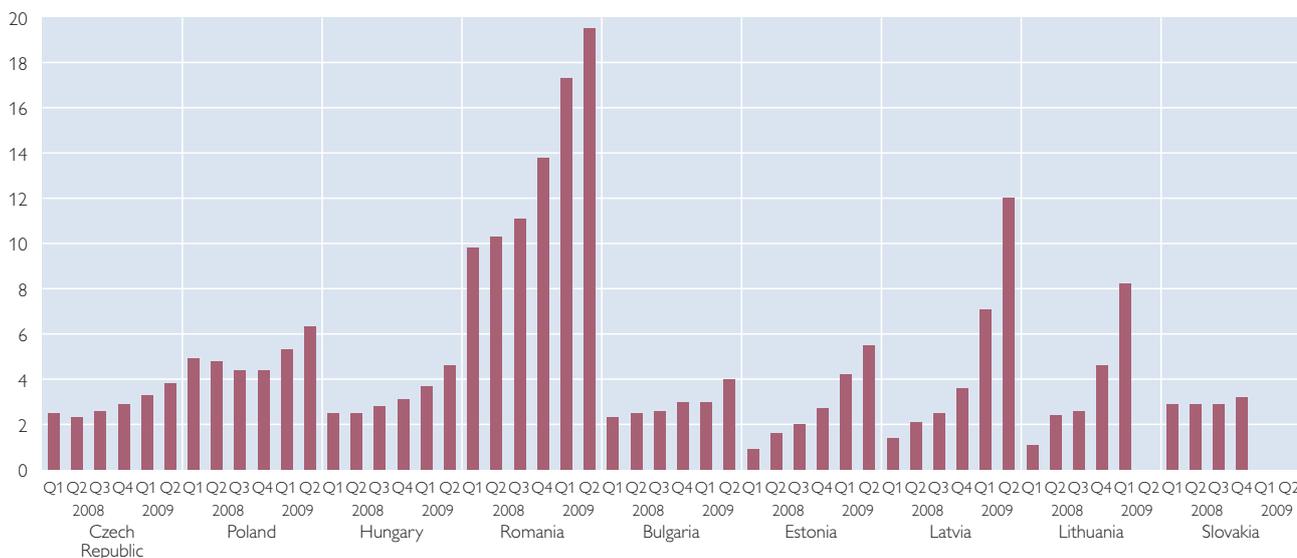
At the same time, the macrofinancial risk profile of the CESEE countries has, on balance, improved somewhat, following a considerable deterioration during the last few months of 2008 and at the beginning of 2009, albeit to varying extents from country to country. International financial aid bestowed upon the region was instrumental in raising the risk profile. Nevertheless, the risks in many areas remain somewhat higher than in the late fall of 2008, primarily due to the sharp deterioration in the global economic situation.

In particular, macroeconomic and cyclical risks were significantly affected by the slump in external demand and a reduction in domestic demand. Slovakia and Slovenia mitigated these risks slightly in the short term by their entry into the euro area. In the medium term, however, they may suffer losses in competitiveness vis-à-vis major competitors in the region, namely Poland, Hungary, Romania and the Czech

Chart 6

Nonperforming Loans

% of total lending



Source: National central banks.

Republic, especially if the real depreciation of the national currencies against the euro that occurred at the end of 2008 through the beginning of 2009 persists. Government balances will deteriorate in all countries, and in some cases considerably, primarily due to cyclical factors. Anticyclical fiscal measures will reach critical mass in only a few countries.

Owing to the dramatic downturn in the real economy, credit risks and risks to the banking sector have increased in all countries. Furthermore, the depreciation, particularly in the first quarter of 2009, of those currencies operating under a flexible exchange rate regime as well as the widespread prevalence of loans denominated in foreign currency have heightened the credit risk of banks. In the meantime, currency markets have stabilized, with some countries' currencies recovering some of their loss in value. Nevertheless, the currencies are still trading below or far below their values during the summer of 2008. This increase in credit risk is also clearly evident, for example, from the growing proportion of non-performing loans in total lending.

By contrast, external economic risks and exchange rate risks have been kept in check by the significant improvement in current account balances over the last few months (section 3.4) and by the rapid and extensive international financial aid that has been granted to those countries particularly hard hit by the crisis.

3.2 Growth Declines Sharply in the First Half of 2009

While financial markets were stabilizing and the region's risk profile was showing signs of improvement vis-à-vis late fall 2008, the crisis was having a growing negative impact on the real economy. The overall economic situation in the CESEE countries deteriorated considerably in the first half of 2009. GDP growth in the region fell dramatically, standing on average at -4.8% in the second quarter of 2009 (compared with the same quarter of 2008). All countries except Poland posted negative growth; the Baltic states even recorded double-digit negative growth. The recession deepened further in most countries, with only Slovakia registering a slight slowdown in the downturn.

Table 1

Economic Growth in the CESEE EU Member States

	2008	2009 ¹	2010 ¹	Q3 08	Q4 08	Q1 09	Q2 09
<i>Real GDP growth rate (annual change in %)</i>							
Bulgaria	6.0	-6.5	-2.5	6.8	3.5	-3.5	-4.9
Estonia	-3.6	-14.0	-2.6	-3.2	-9.2	-15.0	-16.1
Latvia	-4.6	-18.0	-4.0	-5.2	-10.3	-18.0	-18.7
Lithuania	3.0	-18.5	-4.0	2.9	-2.2	-13.3	-20.2
Poland	4.9	1.0	2.2	5.5	2.4	1.1	1.1
Romania	7.1	-8.5	0.5	9.2	2.9	-6.2	-8.7
Slovakia	6.4	-4.7	3.7	6.6	2.5	-5.6	-5.3
Slovenia	3.5	-4.7	0.6	3.9	-0.8	-8.3	-9.3
Czech Republic	3.0	-4.3	1.3	3.9	0.0	-4.4	-5.8
Hungary	0.6	-6.7	-0.9	1.3	-2.5	-6.7	-7.5
Entire region	4.2	-4.4	0.9	5.0	0.9	-3.8	-4.8
Euro area	0.9	-4.2	0.3	0.5	-1.7	-4.9	-4.7

Source: Eurostat, IMF, national statistical institutes.

¹ IMF forecast (October 2009).

The decline was due primarily to strong negative contributions from gross fixed capital formation and extensive destocking. This development can be attributed to the plight of the region's industrial sector, which has been particularly hard hit by the crisis. The fall in external demand and the general deterioration in the international climate resulted in a steep decline in industrial production owing to this sector's heavy reliance on exports. In July 2009, industrial production slumped by an average 11.3% and, in some countries, by more than 20%. The figures for capacity utilization and industrial confidence were also down. These factors led to a reduction in investment that was exacerbated by the high levels of uncertainty surrounding the development of the global economy. Consequently, inventories were drawn down, which made a strong negative contribution to growth in most countries in the second quarter of 2009. Financing conditions for companies in the region deteriorated, and growth in lending to the corporate sector (compared with the previous month) came to a standstill in February 2009 and has since been negative.

Further negative growth stimuli came from exports, which fell sharply in all countries of the region as a result of weak international demand. However, as weak domestic activity (owing mainly to sluggish investment) meant that imports in the CESEE countries declined more dramatically than exports, net exports made a positive contribution to growth in almost all countries – and in some cases this contribution was quite large.

Average private consumption growth in the region slowed at a somewhat less vigorous pace than that of other GDP components and was still in positive territory in some Central

European countries. There were, however, strong negative contributions from the component, particularly in the Baltic states, Romania, Bulgaria and Hungary, owing to declining employment and falling wages. Furthermore, unemployment went up in all countries of the region as a result of weak economic growth and to a certain extent also due to the rise in remigration from western European countries (e.g. in Poland). Growth in lending to the household sector slowed sharply, with lending volumes starting to dwindle in July 2009.

3.3 Is There a Silver Lining on the Horizon?

Notwithstanding the weak economic conditions in the second quarter of 2009, there are now tentative signs of a stabilization in the economic situation. This is evident from a closer look at current growth figures. Although growth rates continued to fall in most countries in the second quarter of 2009, the decline was less sizable than in the first quarter (–3.8% in the first quarter of 2009 to –4.8% in the second quarter compared with +0.9% in the fourth quarter of 2008 to –3.8% in the first quarter of 2009). It should also be noted that the Czech Republic, Slovenia, Slovakia and Poland posted positive growth rates again in the second quarter of 2009 compared with the previous quarter. In Slovakia, growth even came to 2.2%, probably due to the pronounced trade integration with Germany and the +0.3% quarter-on-quarter recovery in Germany.

Furthermore, GDP fell significantly in those countries exhibiting considerable economic imbalances prior to the crisis. Hungary, the Baltic states and Romania were characterized by a high external debt burden, loans denominated in foreign currency accounting

for a large proportion of total lending and, in some cases, excessive lending growth and high current account deficits. Consequently, these countries are particularly vulnerable to changes in the international economic environment. At the same time, especially the Central European countries entered the crisis with comparatively sounder fundamentals, which is now clearly reflected in their better economic performance. There are therefore marked differences between the countries of the region, with current growth figures showing that the Central European countries appear to be emerging from the recession more quickly (and not only compared with the rest of the region, but also the whole of Europe). Current forecasts also confirm this development, with Poland, the Czech Republic and Slovakia set to grow more quickly than the euro area in 2010. For the region as a whole, the growth differential to the euro area is forecast to rise to 0.6 percentage points from -0.2 percentage points in 2009.

In recent months, important activity indicators have also improved somewhat. For example, the average size of the contraction in industrial production fell significantly from 17.1% in March to 11.3% in July 2009. In July and August 2009, survey data also pointed to a slight pickup in export orders. Furthermore, the confidence indicators for the countries of the region improved significantly. Having reached its lowest level in years in the first quarter of 2009, economic confidence went up quite markedly between May and August 2009, the increase being more pronounced in industrial confidence than in consumer confidence.

Other factors pointing to a recovery in the economy in the second half of the year include the stabilization in international financial markets during

the second and third quarters, as well as positive base effects stemming from the downturn at the end of 2008, which will materialize as of the fourth quarter of 2009. Furthermore, subdued investment and massive destocking since the beginning of 2009 should, in the meantime, have created a certain level of investment demand that will be realized over the next few quarters.

3.4 Economic Crisis Triggers Decline in External Deficits

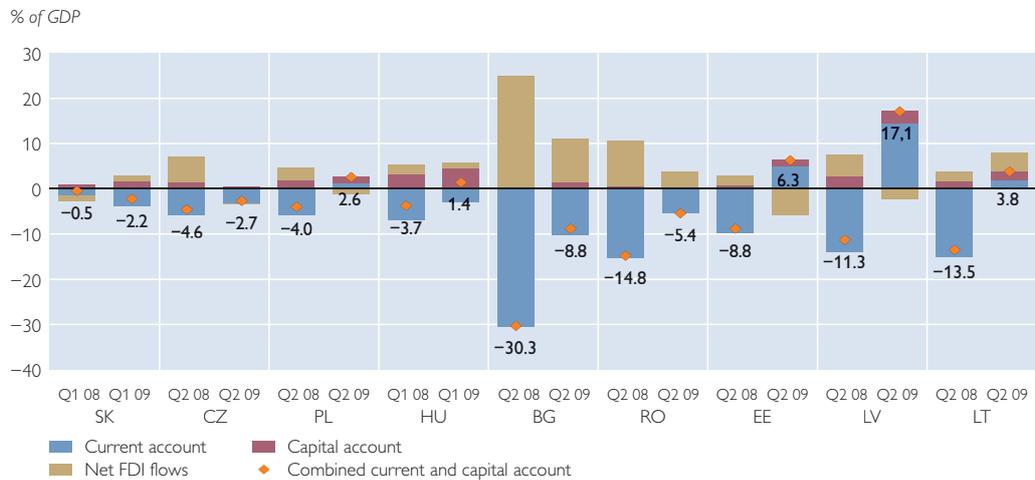
The financial crisis and the associated slump in growth have triggered a sharp reduction in external imbalances in the region, with some countries' deficit even becoming a surplus. Only in Slovakia did the combined current and capital account balance decline year on year in the first quarter of 2009 (the figures for the second quarter are not yet available).

With the exception of Lithuania, net FDI flows dropped in all countries in the second quarter of 2009. In the first quarter, net FDI flows in the region were still positive, but in the second quarter they turned negative in the Czech Republic, Poland, Estonia and Latvia. By contrast, net inflows of portfolio investment improved somewhat in the second quarter compared with the first quarter, with many countries posting inflows again after the negative levels of the first quarter. This could also be viewed as an indication that the economic crisis has spilled over more into the real economy, as confidence has returned to the financial sector after the fall 2008 shocks.

3.5 Inflation Falls Rapidly in the Region

As in the euro area, inflation in the CESEE EU Member States has eased considerably in recent months. Over the year until August 2009, inflation

Balance of Payments Developments



Source: National central banks.

fell on average by 3.2 percentage points compared with the annual average for 2008. However, the overall decline masks significant differences between the countries: While inflation remained more or less at the same level in Poland (partly due to the considerable depreciation of the Polish zloty at the beginning of the year) and has even risen in Hungary in recent months (following the VAT increase in July 2009), it was on a rapid downward

trend particularly in Bulgaria, Estonia, Latvia and Lithuania. Estonia, Slovenia and the Czech Republic slid into deflation in July 2009. However, only in Estonia did prices continue to fall in August too.

The main reason for the falling inflation rate was the general weakening of economic activity, which had a dampening impact on all components of inflation. In addition, inflationary pressures were curbed by favorable

Table 2

Price Developments in the CESEE EU Member States

	2008	2009 ¹	2010 ¹	Apr. 09	May 09	June 09	July 09	Aug. 09
Annual rate of changes in the HICP in %								
Bulgaria	12.0	2.7	1.6	3.8	3.0	2.6	1.0	1.3
Estonia	10.6	0.0	-0.2	0.9	0.3	-0.5	-0.4	-0.7
Latvia	15.3	3.1	-3.5	5.9	4.4	3.1	2.1	1.5
Lithuania	11.1	3.5	-2.9	5.9	4.9	3.9	2.6	2.2
Poland	4.2	3.4	2.6	4.3	4.2	4.2	4.5	4.3
Romania	7.9	5.5	3.6	6.5	5.9	5.9	5.0	4.9
Slovakia	3.9	1.5	2.3	1.4	1.1	0.7	0.6	0.5
Slovenia	5.5	0.5	1.5	1.1	0.5	0.2	-0.6	0.1
Czech Republic	6.3	1.0	1.1	1.3	0.9	0.8	-0.1	0.0
Hungary	6.0	4.5	4.1	3.2	3.8	3.7	4.9	5.0
Entire region	6.3	2.9	0.2	3.8	3.5	3.4	3.2	3.1
Euro area	3.3	0.3	0.8	0.6	0.0	-0.1	-0.6	-0.2

Source: Eurostat, IMF.

¹ IMF forecast (October 2009).

base effects stemming from energy and food prices, as well as by falling commodity prices (primarily due to the decline in the global price of crude oil associated with the low level of activity in the world economy).

Central banks in the region responded to this development and to the decrease in inflation risks in the medium term (owing to the weakening of economic activity) by cutting their key interest rates (by 200 basis points in Hungary, 175 basis points in Romania, by 150 basis points in Poland and 175 basis points in the Czech Republic since the beginning of the year).

4 Austrian Economic Growth to Turn Positive in Second Half of 2009

4.1 Austrian Economy Shows Signs of Bottoming Out

The Austrian economy saw the worst slump of the post-war period in the first quarter of 2009, contracting by 2.7% in real terms vis-à-vis the previous quarter (seasonally and working day-adjusted). Against the backdrop of an improved global outlook, the down-

ward spiral slowed considerably and the economy shrank by 0.5% in the second quarter (−4.5% year on year). Consumer spending growth (+0.4%) cushioned the downturn, as exports and imports declined at a much slower pace than in the previous quarters (−2.3% and −1.5% respectively). However, at −1.9%, the decrease in investment continued almost unabated compared with the previous quarters.

The release of the national accounts data for the second quarter has prompted a major revision of historical GDP rates. Contrary to earlier data, the economy contracted earlier and more strongly than previously believed (by −0.4% in the third and −1.0% in the fourth quarter of 2008). These figures suggest that the path of the Austrian economy during the crisis – calculated ex post – is increasingly following that of the euro area and the German economies. It seems that the lagged downturn of the Austrian economy discussed after initial data releases was actually a statistical error rather than a fact.

Table 3

Results of the National Accounts for the Second Quarter of 2009

	GDP	Private consumption	Government consumption	Gross fixed capital formation	Exports	Imports
Quarterly change in %						
Q1 08	1.1	0.2	−1.2	0.3	1.3	−0.6
Q2 08	0.3	0.1	2.8	−0.2	−0.9	−0.4
Q3 08	−0.4	0.1	−0.7	−1.3	−3.2	−3.1
Q4 08	−1.0	0.1	1.8	−2.1	−5.4	−3.9
Q1 09	−2.7	0.1	−1.3	−2.3	−7.4	−4.5
Q2 09	−0.5	0.4	0.4	−1.9	−2.3	−1.5
Annual change in %						
2005	2.9	2.0	1.7	2.0	7.6	7.1
2006	3.4	1.9	2.5	2.3	7.7	5.5
2007	3.4	0.9	2.0	2.7	9.3	6.7
2008	1.9	0.6	3.1	−0.6	0.7	−1.8

Source: Eurostat.

Results of the OeNB Short-Term Indicator of October 2009¹

The economic outlook for the second half of 2009 has improved considerably recently. The OeNB's latest short-term indicator results show real GDP growth at 0.4% in both the third and fourth quarters of 2009 (seasonally and working day-adjusted, on a quarterly basis). This means that, after contracting for four consecutive quarters, the Austrian economy will return to a path of positive growth. Owing to the sharp slump recorded at the beginning of the year, a 3.6% contraction is forecast for the full year 2009. The swifter recovery of the global economy is the main reason for the more upbeat outlook for the second half of 2009. Two additional factors are expected to underpin growth: First, the fiscal stimulus measures launched in Austria and many other countries are contributing to a stabilization of demand, and second, the pronounced destocking seen over the past months is an indication that inventory investment is set to pick up in the second half of 2009. The unwinding of temporary factors, however, implies the danger of a setback to the recovery during 2010.

Short-Term Outlook for Austria's Real GDP in the Third and Fourth Quarters of 2009 (seasonally and working day-adjusted)

2007				2008				2009			
Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Year-on-year quarterly change in %											
4.0	3.7	3.1	2.9	3.0	2.8	2.0	-0.1	-3.8	-4.5	-3.8	-2.4
Quarterly change in %											
1.0	0.4	0.5	1.0	1.1	0.3	-0.4	-1.0	-2.7	-0.5	0.4	0.4
Annual change in %											
3.4				1.9				-3.6			

Source: OeNB – Results of the OeNB economic indicator of October 2009, Eurostat.

¹ The next release of the OeNB's short-term indicator is scheduled for January 2010.

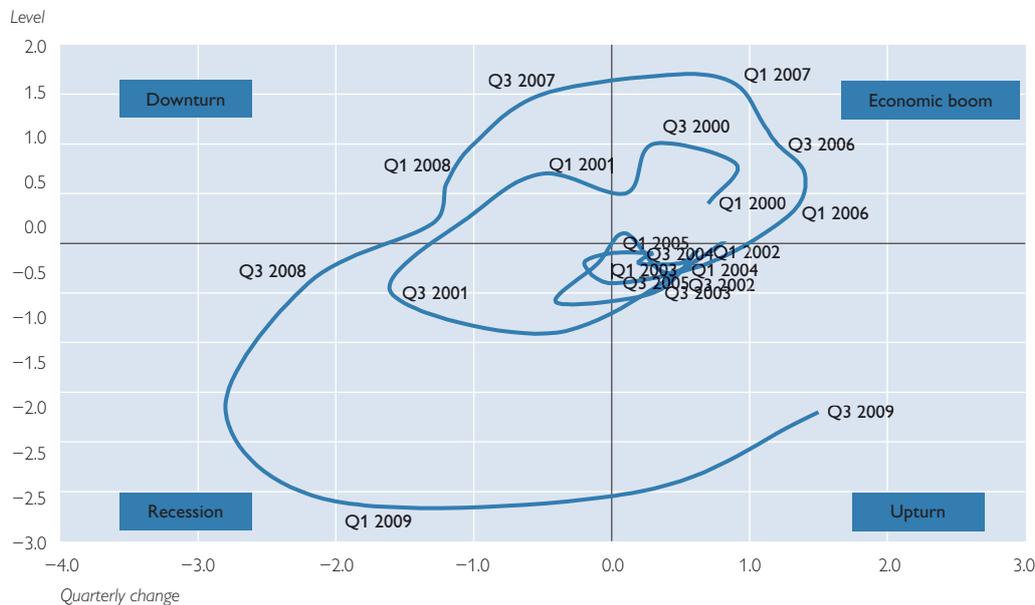
4.2 Confidence Indicators Improve Notably

Over the past months, all confidence indicators have picked up from their historical lows. Most indicators, however, continue to stand at levels significantly below their long-run averages. One of the few exceptions is the Purchasing Managers' Index (PMI) for new orders, which has been above the 50-point threshold between economic expansion and contraction for two months. At 1.4, the ratio of new orders to inventories reached one of its highest ever levels, indicating an imminent acceleration in industrial activity,

driven to a large extent by the inventory cycle. The European Commission's Economic Sentiment Indicator for Austria has improved by 14.3 points since hitting its historic low in April 2009 and reached 80.1 points in August. This is the largest increase ever to be recorded over a period of four months. Apparently, economic sentiment has improved in all sectors surveyed. Despite the marked improvement, the current level is still far below its long-run average of 100. The surge in confidence over the past few months can be partly explained as a correction of the previous excessive drop. It is therefore

Chart 8

Business Cycle Clock – Confidence Indicator¹



Source: Eurostat.

¹ The confidence indicator in the chart is an unweighted average of the data on business and consumer confidence compiled by Eurostat. The values of both levels and of rates of change are standardized at around zero.

still too early to ascertain the sustainability of the upswing as indicated by the business cycle clock (chart 8).

4.3 Labor Market Tensions Set to Continue

The crisis has led to a marked deterioration in the labor market. In August 2009, the number of jobs was down by 67,000 from August 2008, and the number of unemployed had risen by 55,000. Employment policy measures have to some extent cushioned the impact of the crisis on the labor market: First, the extension of the range of training programs offered by the Austrian Public Employment Service (AMS) has prevented a steeper rise in unemployment. In August, almost 58,000 unemployed persons participated in AMS training programs,

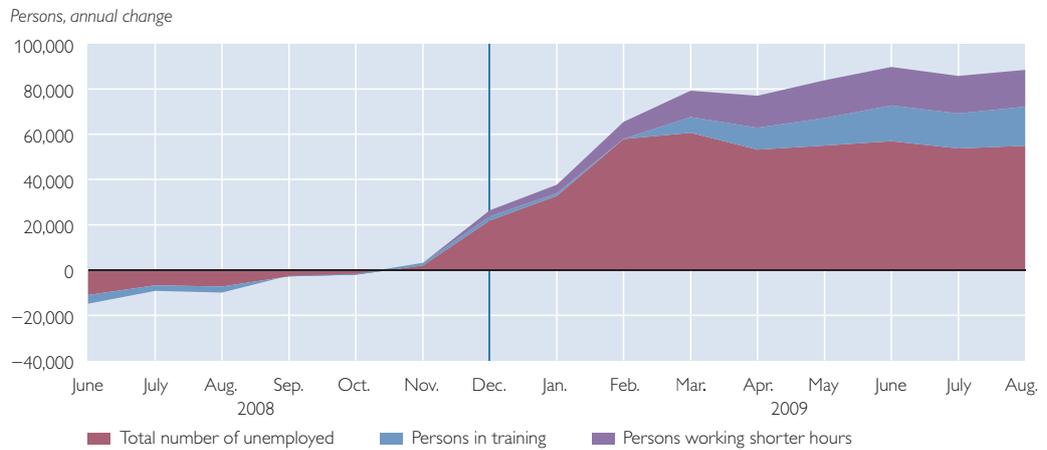
17,000 more than one year earlier. Second, enterprises have been making extensive use of short-time working schemes², which had been extended gradually as the crisis unfolded, with over 54,000 persons working shorter hours in August (chart 9). The unemployment rate (national definition, seasonally adjusted) rose to 7.6% in August 2009 vis-à-vis 5.9% one year earlier. Unemployment as defined by Eurostat was 4.4% in July, up 0.7 percentage point from the rate recorded in July 2008. A breakdown by sectors shows that manufacturing has been particularly hard hit, accounting for about two-thirds of the job losses.

Developments in the real economy feed through to the labor market with a lag of a few months. Labor market conditions can therefore be expected to

² On average, employees placed on short-term working schemes work about 70% of their regular working hours.

Chart 9

Unemployment, Training and Short-Time Work Developments¹



Source: AMS, Eurostat, Statistik Austria.

¹ According to AMS, the average reduction in working hours is 30%. The number of persons working shorter hours was therefore multiplied by a factor of 0.3.

tighten further in the second half of the year. The decrease in the number of reported vacancies – a leading indicator of labor market developments – came to almost 10,000 in August 2009 (year on year), thus supporting this prediction. In view of the subdued growth outlook and the delayed effects of business cycle developments on the labor market conditions cannot be expected to improve in 2010.

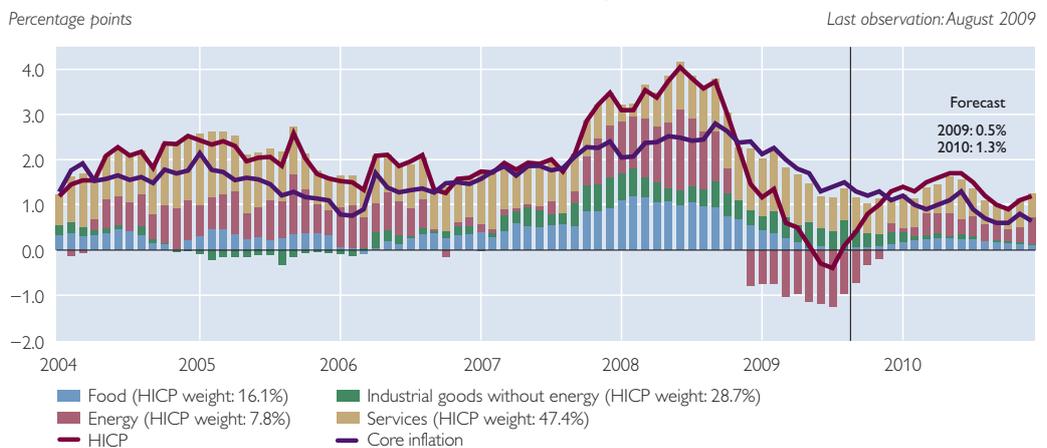
4.4 Inflation to Stabilize at a Low Level

HICP inflation stood at 0.1% in August 2009 (CPI: +0.3%), marking the return of price growth to positive territory after two months of negative rates in the summer. Fuel and heating oil prices continue to play a primary role in determining the course of inflation.

Owing to the rise in commodity prices over the past few months, infla-

Chart 10

HICP Inflation and Contributions from Subcomponents



Source: OeNB, Statistik Austria.

tion rates can be expected to pick up somewhat in 2010. However, with growth expected to be weak, price growth will remain well below the 2% target. HICP inflation for the full year 2009 is set at 0.5% and is expected to accelerate to 1.3% in 2010. Core infla-

tion (excluding energy and unprocessed food) is anticipated to be 1.5% in 2009 and to drop to just below 1% in 2010 because of developments in nonenergy industrial goods prices and low inflation in services.

Will the Great Recession Lead to a Lasting Impact on Potential Output in Austria?

Paul Gaggl,
Jürgen Janger¹

Based on the European Commission's (2009) projections for potential output, we calculate a permanent potential output loss of between 4% and 6% until 2013, while we expect that the growth rate will eventually return to its precrisis level of close to 2% in the medium run before the effects of population aging set in. We do not expect high growth rates of actual GDP during the recovery. In a more pessimistic view, the effects of the crisis may seamlessly link with the effects of population aging on potential output, implying a decrease in trend potential output growth to about 1.5% by 2030. In an optimistic scenario, by 2011 most of the structural effects of the crisis will have disappeared and productivity growth will accelerate by 2020 to compensate for declining labor input, stabilizing the path of potential output. While uncertainty is high, it is likely that anti-climate-change policies, energy scarcity and an increase in both competition and demand from emerging markets will provide powerful incentives to innovate and invest. Adequate economic policies will be required in order to respond positively to these incentives. The crucial role of policies in raising medium-term output after severe recessions is also demonstrated by countries such as Finland, Sweden and Japan.

JEL classification: O11, E32

Keywords: potential output, financial crisis

The economic and financial crisis which began in 2008 has already led to the biggest drop in GDP in 2008 and 2009 since the Great Depression of the 1930s, earning it the name “Great Recession” (Rampell, 2009). Chart 1 shows that the Austrian recessions since 1980 have barely affected the path of potential output, which grows at around 2% a year but was on a downward trend even before the crisis. Will the impact of this crisis be limited to a short-lived deviation of actual output from longer-term trend output, or will it have lasting effects on the level or growth rate of output?

We examine this question by looking at the possible evolution of potential output in Austria in light of the crisis.

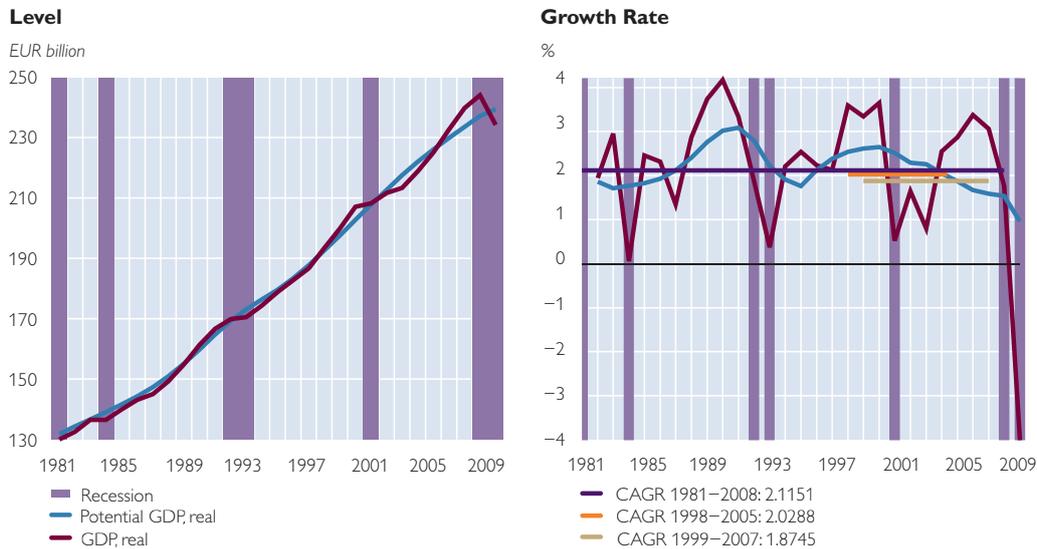
Section 1 defines the concept of potential output that we will use in this study. Section 2 discusses the potential influence of the crisis on the determinants of potential output and surveys estimates of the cost of previous financial crises or recessions. In section 3 we present estimates of the level and the growth rate of Austrian potential output derived using different methodologies. These estimates will serve as a baseline for a second article on potential output in Austria by Grossmann et al. (2009), which will focus on the consequences of lower potential output for fiscal policy in particular and ways to spur potential output growth in general. Section 4 concludes with possible growth scenarios.

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Chart 1

ECFIN Medium-Term Projections



Source: European Commission's Directorate-General for Economic and Financial Affairs (ECFIN).

Note: European Commission (2009) projections for potential and actual GDP. The reported averages are long-run compound annual growth rates (CAGR).

1 The Concept of Potential Output: Why Does It Matter?

Basu and Fernald (2009) distinguish between three concepts of potential output. The first is akin to longer-term trend growth, a steady-state measure of growth based on trend growth of the production factors labor, capital and technological progress. Solow (2001) thinks of “growth theory as precisely the theory of evolution of potential output.” Many long-run growth studies focus on productivity as a driver of living standards only, but long-term potential output – which includes capital deepening and hours worked – matters for policymakers as well: It affects the sustainability of the general government budget and debt and determines the long-run demand for fixed investment, infrastructure and government services (Gordon, 2008).

The second is a more short-term concept which refers to the level of output the economy would have if there were no nominal rigidities, the “flexible-price output.” This concept is ex-

plicitly modeled in New Keynesian models, where the sluggish adjustment of prices and wages to their long-run equilibrium values can lead to a gap between actual and potential output which is related to inflation. This “output gap” is an important variable for stabilization policies – for both monetary and fiscal policymakers – as it may serve as an indicator of the balance of aggregate demand and supply and hence guide the stance of monetary and fiscal policy. Although real-time estimates of the unobservable output gap are often unreliable (Orphanides and van Norden, 2002), they will certainly inform exit strategies from the currently expansionary macroeconomic policies. This short-term view of potential output corresponds to the older Keynesian version of potential output as the supply side-determined level of production at which there is no inflationary pressure. In the long run, flexible-price output is usually modeled to converge to steady-state output.

A third concept views potential output as the current optimal rate of output in an economy where firms have at least some degree of monopoly power. This definition of potential output is the one employed by most modern dynamic stochastic general equilibrium (DSGE) models (e.g. Christiano et al., 2005), where a central bank has the objective to offset nominal rigidities (i.e. to exploit a short-term New Keynesian Phillips curve), given that the monetary authority is aware of the fact that it cannot offset the monopoly distortion present in the economy. In such a situation, targeting the output which would prevail in a world with flexible prices and perfect markets (concept two) does not necessarily lead to a welfare-efficient allocation.

In our discussion of Austrian potential output we will use the first concept for medium- to long-term projections, but will also discuss the shorter-term evolution, as we aim to produce figures which can guide the fiscal policy stance. Given that monetary policy refers to the output gap of the euro area, not that of Austria, less emphasis will be placed on inflation in Austria. In the above-mentioned policy article on potential output (Grossmann et al., 2009) we implicitly use the third concept, as some policy measures to raise potential output must assume market imperfections which can be alleviated.

2 How Can the Financial and Economic Crisis Affect Potential Output? Channels and Historical Experience

Although long-term potential output follows a rather smooth path, lasting structural changes can affect its level and growth rate. Examples include the still not fully understood productivity slowdown of the 1970s and the effects of an aging population, which will al-

most certainly reduce the contribution of labor to potential output from around 2020. Short-term (flexible-price) output may in addition be influenced by a variety of other factors, such as lagged medium-term demand patterns (as illustrated in Germany, where depressed investment growth rates from 2001 to 2003 reduced the contribution of capital to potential output), or more structural features, such as changes in short-term structural unemployment.

Hence, to look for change, we need to identify the most important features of the current and previous financial crises and to examine how they may affect potential output in the medium to long run. As real-time estimates are very difficult, a closer look at the transmission channels in theory and at past empirical lessons will help us to gain a deeper understanding of these issues. As a result, this section will also serve to underpin our estimates of potential output in section 3.

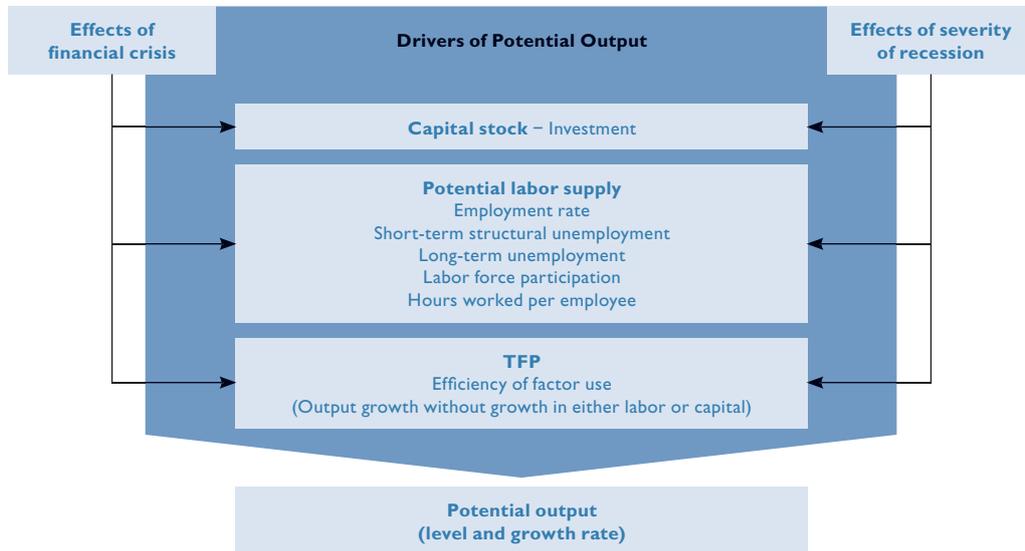
2.1 Distinctive Features of the Great Recession: Severity and Financial Constraints

We propose that two distinctive features of the current Great Recession are its economic severity (in terms of duration, reach and output lost) and the prevailing financing conditions. Chart 2 summarizes the impact of financial constraints and of the severity of the crisis on the drivers of potential output.

Chart 3 plots quarterly GDP two quarters before and eight quarters after the economic peaks preceding all Austrian recessions since 1980, as identified by Ragacs and Vondra (2009). The economic peak or turning point of the economy is set to 100. In this contribution, recessions are defined as periods including at least one quarter of negative GDP growth.

Chart 2

Effects of Two Distinctive Features of the Crisis on Potential Output



Source: OeNB.

Actual data are used until the first quarter of 2009, after which point the chart follows the official OeNB forecast of June 2009. Looking at GDP and its private sector components consumption, demand and investment, it is clear that this recession is by far the most severe that Austria has known in a long time.

This matters for potential output at the aggregate level, as the large output loss associated with financial crises is highly persistent and is frequently never recovered at all, pointing to a level shift in potential GDP (Cerra and Saxena, 2008)². Comin and Gertler (2006) propose a model mechanism through which non-technological shocks at the business cycle frequency can have sustained effects on productivity over the medium term, working through the pace of both research and development (R&D) activities and the adoption of new tech-

nologies. Strong sectoral demand shocks can also give rise to a medium-term effect on potential output, if lasting sectoral reallocation processes require a change in the skill composition of the workforce and structural unemployment rises for some time as a consequence. We will discuss some mechanisms in detail when we examine the channels capital, labor and productivity.

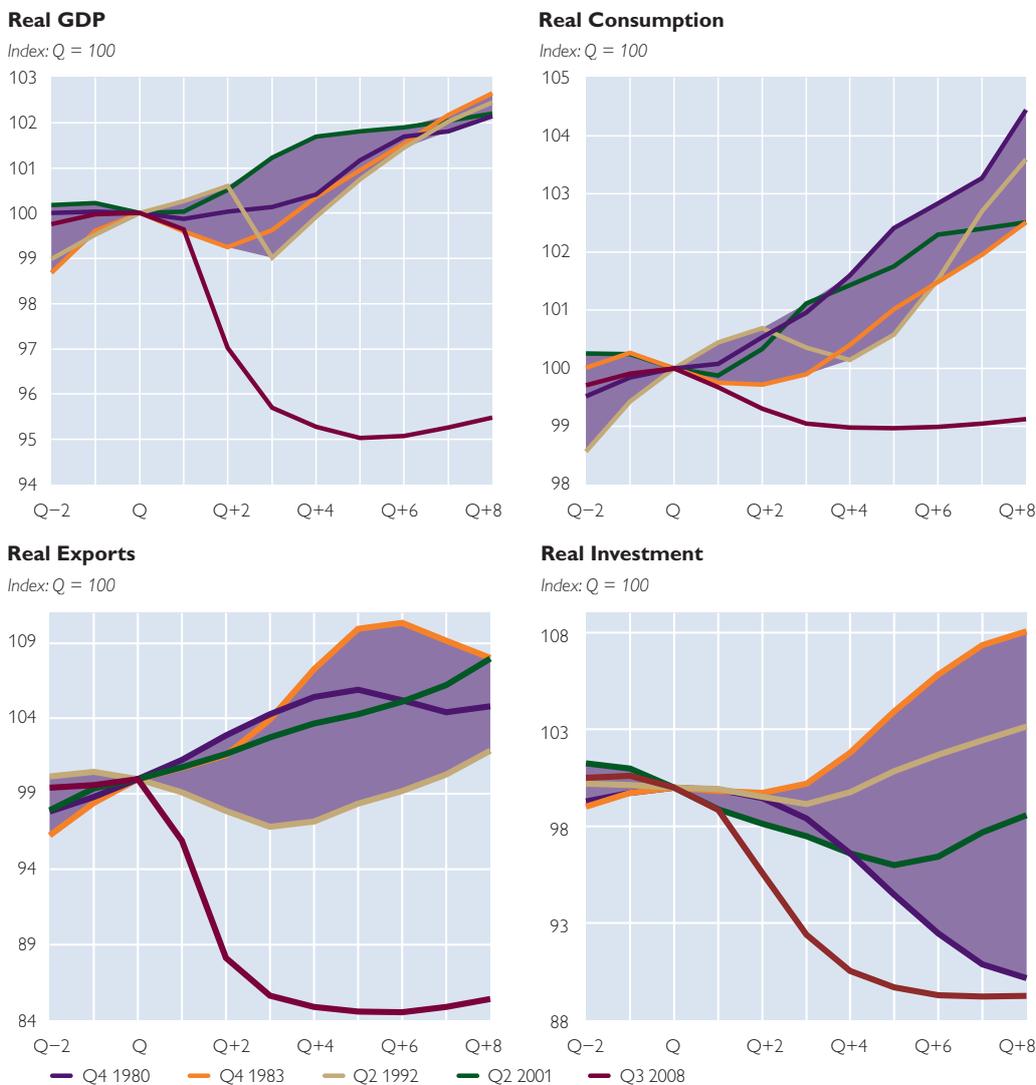
Indirectly, the severity of the crisis may lead to primarily short-term policies that dampen potential output in the long term. On the other hand, the crisis may focus a country’s political energies on reforms which could foster potential output growth.

Financial Constraints

Tighter conditions, in terms of both quantity and cost, for raising external finance could have a lasting effect on

² There is also a wider literature examining the consequences of output volatility for growth, starting with Ramey and Ramey (1995). The analysis by Barlevy (2004) suggests that if it were possible to eliminate fluctuations, this could increase the growth rate by 0.35 percentage points to 0.40 percentage points. For a survey of the literature on cycles and growth, see Gaggli and Steindl (2007).

GDP and Its Components in Austria during Recessions since 1980



Source: OeNB.

Note: The dates of the recession peaks (indicated in the legend) and the data are drawn from the OeNB's official June 2009 forecast based on Eurostat data. The data for responses to the current economic crisis end with Q1 2009 (Q+2); thereafter, the OeNB's June 2009 forecast data are used.

the user cost of capital, thereby dampening investment. While the scope of the financial crisis has certainly been unprecedented, the most current data for Austria show an easing of financing conditions, both for corporate bonds and for bank loans, relative to the peak of the crisis in autumn 2008. The left-hand panel of chart 8 shows the spread between the yields of

AAA and BBB corporate bonds over time, which is often used as a proxy for the premium on risk, as well as average bank loan interest rates for large, variable-rate loans (i.e. those with an initial rate fixation of less than one year, which amount to 79% of total loans). While the risk premium is still high, it has come down a long way since autumn 2008 and again since

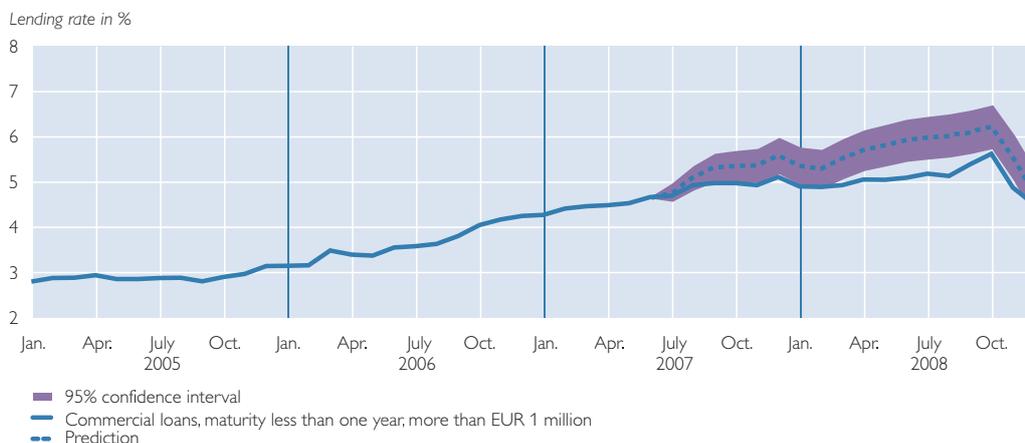
March 2009.³ It has often been argued that a return to the financing costs or the prevailing risk premiums of the 1980s or 1990s would have a major impact on investment (e.g. European Commission, 2009). However, the average risk premium in the period from 2000 to 2007 was actually higher than in the 1990s; the level in the 1980s was about 50 basis points higher (as euro area data are only available since 1999, we use the U.S. spreads as a proxy).

Bank loan interest rates have also followed the reduction in rates by the ECB. We use the updated estimations by Jobst and Kwapil (2008), who show that actual interest rates are even lower than the forecast retail interest rate reaction to ECB rates (chart 4).⁴ For the

moment, the monetary transmission channel via bank lending does not seem to be impaired, as no significant deviation from the historical pattern of the pass-through of money market interest rates to retail interest rates can be detected. There has also been no change in the composition of loan flows toward more short-term loans. On the contrary, long-term loans over five years still amount to roughly 60% of total loans, while their growth rates since July 2007 – the start of the subprime crisis – have been much higher than those of short-term loans (0.5% versus 0.1% on a monthly basis) (OeNB, 2009). This rather positive pattern may be due to the prevalence of relationship banking in Austria.

Chart 4

Commercial Loans: Comparison of Estimated Interest Rate Pass-Through and Actual Data



Source: OeNB, Jobst and Kwapil (2008).

Note: The chart plots lending rates on Austrian commercial loans with maturity less than one year and a value of more than EUR 1 million as reported by the OeNB. The dashed line illustrates the predictive power of the EURIBOR as of June 2007 including 95% confidence intervals around each point prediction based on an error correction specification by Jobst and Kwapil (2008). These predictions test whether the structural relation between the EURIBOR and commercial lending rates prevailed after June 2007.

³ This is mirrored by the spreads between corporate AAA bonds and the German or Austrian 10-year benchmark bonds: The spread between corporate AAA bonds and German 10-year government bonds fell from a peak of 350 basis points to 40 basis points by mid-September 2009, while that between AAA bonds and Austrian 10-year government bonds declined from 260 basis points to 0 over the same period.

⁴ Interest rates for smaller variable-rate loans of below EUR 1 million show the same pattern. Variable-rate loans amount to 91% of total loans to nonfinancial corporations in Austria, while 79% of total loans are for amounts above EUR 1 million.

Actual loan volumes continue to grow in 2009, if at a slower pace (5.5% in April 2009; see OeNB, 2009). Disentangling supply and demand effects is notoriously difficult, as firms also demand less credit in a recession. Moreover, there have been shifts from capital market financing into loan financing: Bank loans became more important in 2008, accounting for almost 73% of external financing in the second half of 2008 (up from around 31% in the first half of 2008, as compared with almost 50% in 1995) (Waschiczek, 2008). Capital market financing, e.g. via the issuance of quoted shares, has however come to a standstill since 2008, while the market for corporate bonds has recovered since April 2009, with over EUR 8 billion raised by Austrian firms. Continuing credit growth may also be due to reduced cash flow.

The Austrian results of the euro area-wide bank lending survey point to a tightening of credit standards such as margins, collateral requirements and covenants, although the tightening in the second quarter of 2009 was less pronounced than that in the first quarter, pointing to a turning point in the tightening cycle in line with the rest of the euro area (ECB, 2009a). Refinancing conditions for banks have improved, partly due to the injection of public capital (OeNB, 2009).

On balance, the financial constraints for Austrian firms in the wake of the crisis may be somewhat less pronounced than in other countries, where bank lending is actually declining. In particular, a survey by the ECB on access to finance for small and medium-sized enterprises (SMEs) in the euro area (ECB, 2009b) reveals that SMEs

reported a worsening of overall financing conditions to a somewhat greater extent than large firms, while in Austria, large firms were hit through impaired capital market financing. However, both the euro area-wide bank lending survey (ECB, 2009a) and the OECD's economic assessment of September (OECD, 2009a), which includes the OECD's summary indicator of financing conditions, point to an easing of financial constraints and indicate no significant rationing of credit supply.

In view of this evidence, the severity of the economic crisis may have a stronger impact on potential output than financial constraints. This picture could change, of course, as rising firm insolvencies may put banks under renewed stress. Great caution and a close monitoring of financing conditions are necessary to assess their impact on potential output.

2.2 Transmission Channels from the Great Recession to Potential Output

This subsection looks at the possible impact of the Great Recession on the three components of potential output: potential labor supply, trend total factor productivity (TFP) and the actual capital stock. Chart 5 shows the actual evolution of these factors.⁵ For capital and labor inputs, the subsection broadly shares the view put forward in the studies of three international organizations (European Commission, 2009; IMF, 2009a; OECD, 2009b) on which it draws. We have slightly different views on the impact of the recession on TFP, which we see as being more unequivocally negative. However, we also look

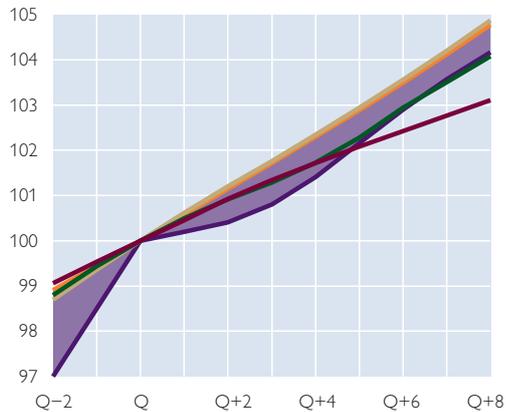
⁵ Note that TFP is estimated as the residual after subtracting labor and capital growth from GDP growth. Hence, it also reflects factor underutilization and the changing quality of factors. Short-term TFP in recessions will always look very bad, unless it is utilization-adjusted.

Chart 5

Austrian Recessions since 1980

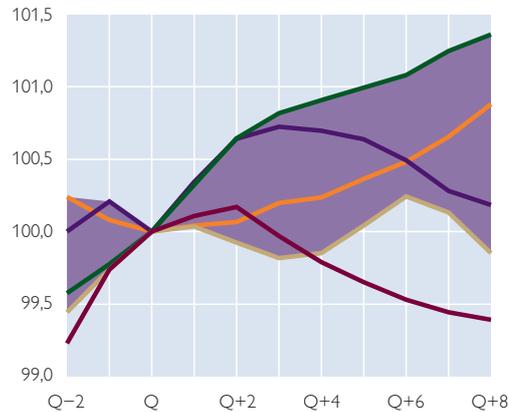
Capital Stock, Real

Index: Q = 100



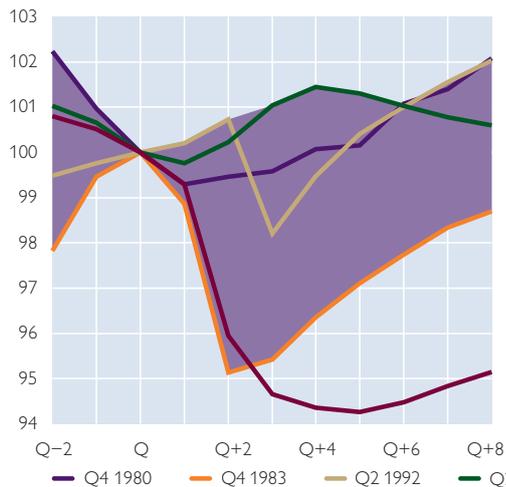
Total Labor Force

Index: Q = 100



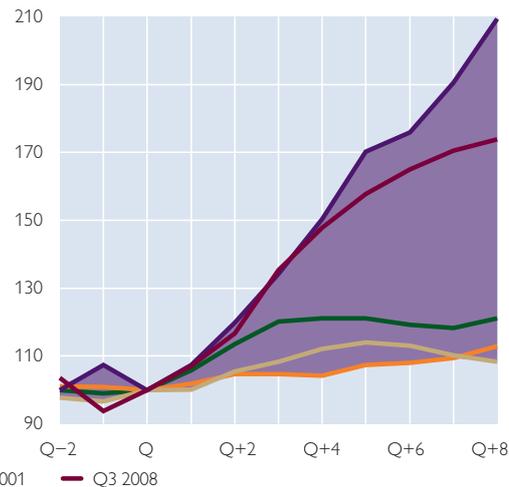
Solow Residual (TFP)

Index: Q = 100



Unemployment Rate

Index: Q = 100



Source: OeNB.

Note: The dates of the recession peaks (indicated in the legend) and the data are drawn from the OeNB's official June 2009 forecast based on Eurostat data. The data for responses to the current economic crisis end with Q1 2009 (Q+2); thereafter, the OeNB's June 2009 forecast data are used.

at the more long-term evolution of TFP, which we find to be rather positive. We will examine each production factor in turn.

Capital

In the short term, the contribution of capital to potential output may be reduced by four effects:

(1) The low investment rates induced by the recession (through lower de-

mand) lead to slower growth of the capital stock.

(2) Financial constraints may further depress short-term investment (i.e. viable investment projects fail due to financing problems) and, more generally as a result of the crisis, we could see a lasting upward shift in the user cost of capital via higher risk premiums, which would reduce the amount of capital held. Barrell

and Kirby (2009) note that the trend-like fall in the user cost of capital during the “Great Moderation” from the early 1990s to 2005 led to a period of capital deepening which may now be over. The increase in risk premiums may lead to a loss of 3% to 4% of GDP in the U.K.

- (3) Financial constraints may be reinforced by lower asset prices which weaken corporate balance sheets and reduce available collateral (Kiyotaki and Moore, 1997).
- (4) The scrapping or depreciation rate of existing capital may accelerate because of insolvencies, sectoral reallocation (e.g. away from construction and the car industry) and the reduction of overcapacities which had built up before the crisis. In the medium to long term, it is likely that only the second effect, that of the higher cost of capital, will persist, although medium-term effects caused by persistently low demand cannot be ruled out.

Labor Input

Potential labor supply is equivalent to trend total hours worked and is determined by the size of the working age population, the participation rate, structural unemployment – which is often measured by the non-accelerating inflation rate of unemployment (NAIRU) – and average hours worked per employee.

Its contribution to potential output in the short term will be affected by a temporary increase in the short-term NAIRU due to processes of sectoral reallocation and the rise in actual unemployment: Because nominally rigid prices and wages slow down the adjustment process, the considerable increase in unemployment during the crisis cannot be reduced quickly with-

out temporarily raising inflation (European Commission, 2009). A short-term positive effect may come from wealth effects: As pension funds have suffered sizeable losses, older workers may stay in the labor force for longer. This effect is likely to be very small in Austria, as the share of funded pensions is small.

In the medium to long term, the contribution of labor to potential output may be reduced by the durably higher user cost of capital, which squeezes firms’ profit margins and increases structural unemployment (Gianella et al., 2008), and by the permanent destruction of human capital as a result of long periods of unemployment. This also depends on labor market policies and institutions. Especially in Europe, negative economic shocks have been found to interact with labor market institutions to produce “hysteresis in unemployment” (Blanchard and Wolfers, 2000). However, many reforms have been carried out since these findings were made, and the European labor market structure has changed. The OECD (2009b) assumes in its NAIRU projections that only two-thirds of long-term unemployment is transformed into structural unemployment, as opposed to three-quarters during the 1990s.

In Austria, long-term unemployment as a share of total unemployment was relatively low before the crisis, at 25% over the period from 1999 to 2008. This was below the EU-15 average of 43% and the OECD average of 30%, similar to the levels of the Scandinavian countries (Denmark: 20%; Finland and Sweden: approximately 25%), but above the levels of some Anglo-Saxon countries (the U.S. and Canada recorded levels of approximately 10%). A further strength of the Austrian labor market is high real-wage flexibility and

strong wage moderation since 1995, leading to high price competitiveness. However, the skill profiles of Austrian workers are heavily based on firm- and industry-specific skills, mostly acquired via vocational training. As a result, in comparison with countries which rely more on general skills, dramatic sectoral reallocation processes – e.g. a shift out of the car industry – may raise structural unemployment. Estimations of the NAIRU are notoriously difficult. For example, in 2006 the European Commission estimated Austrian unemployment related to the business cycle (i.e. not structural) at 20%, while figures from the Austrian labor market service institution AMS pointed to a figure of around 45%. Such differences give rise to significantly different levels of potential output (Steindl, 2006).

Overall, short-term labor input will crucially depend on the severity (in particular in terms of duration) of the crisis and on the scope of sectoral reallocation processes, as well as on future user costs of capital. Time will tell whether labor market institutions have changed.

Total Factor Productivity

TFP measures the efficiency of factor use: TFP growth reflects output growth without growth in other inputs. Most empirical studies of the determinants of long-term growth find that growth in TFP is the major driver of growth in advanced industrial economies (see Hall and Jones, 1999, for the general case, and Gnan et al., 2004, for Austria). There is a large theoretical and

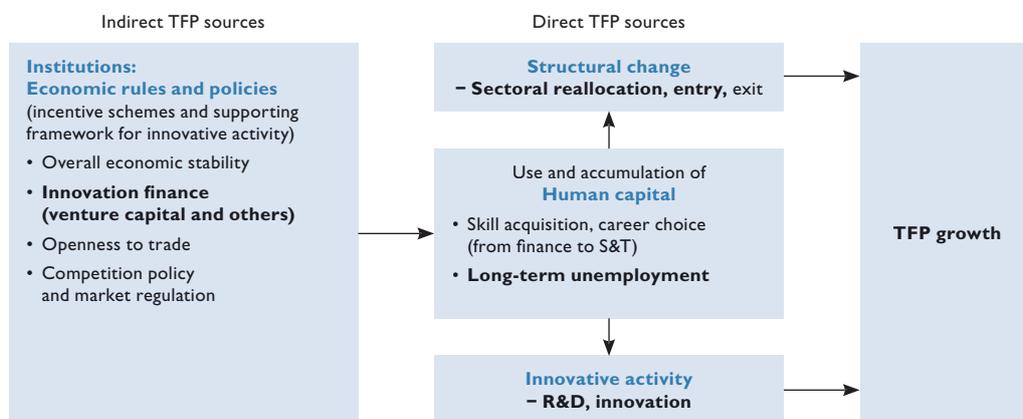
empirical literature on how recessions and credit market frictions affect the contribution of TFP to potential output. On balance, a survey of the available evidence points to the conclusion that recessions are bad for TFP growth even without credit market frictions, i.e. that TFP is procyclical.⁶ The presence of financial constraints usually reinforces the negative effect of recessions on TFP.

Chart 6 summarizes some of the drivers of TFP, based on the article by Gnan et al. (2004). It distinguishes between indirect sources of TFP-enhancing activities, namely institutions and policies which provide incentives and support for such activities, and direct sources of TFP growth, i.e. innovation and structural change.⁷ Both rely on the available human capital. Procyclical TFP drivers are indicated in bold in the chart. Studies which refer to the countercyclical effects of recessions on TFP usually mention two mechanisms. The first is grounded in the classic Schumpeterian idea that during a recession inefficient firms exit the market and the remaining efficient firms gain market share (see e.g. Caballero and Hammour, 1994, on the “cleansing” effect of recessions). Productivity is gained – *ceteris paribus* – through shifts between firms (or sectors). The second effect is based on the idea that in times of recession the opportunity cost of R&D, innovation and restructuring activities is lower. Idle resources stemming from underutilization during a recession can be shifted from current production to future productivity-enhancing activities within firms (see e.g.

⁶ By contrast, Fernald and Matoba (2009) apply a new method for estimating utilization-adjusted TFP developed by Basu et al. (2006) to show that real-time TFP in the U.S.A. is currently rising, not falling. This approach is, however, very recent and will need to be checked against historical data.

⁷ Chart 6 is based on the results of many empirical studies, which usually look at one of the drivers at a time. Coe et al. (2009) recently estimated the impact of several TFP drivers in one approach.

Determining Factors of TFP Growth in Austria



Source: OeNB.

Note: Procyclical factors in black bold print.

Aghion and St. Paul, 1998), implying countercyclical R&D spending.

While both mechanisms may indeed occur in practice, the limited evidence on recessions as drivers of productivity is mixed (see Barlevy, 2003, for a short summary). By contrast, empirical studies usually find strongly procyclical R&D and innovation activities (Barlevy, 2007; Bundesministerien, 2009). Positive productivity effects are definitely derived from the exit of inefficient firms, but microdata reveal that their contribution to overall productivity growth is small compared with the productivity gains achieved within existing firms (Bartelsman et al., 2004), and that the contribution of reallocation to aggregate productivity is only modestly countercyclical (Foster et al., 2001) or even procyclical (Eisfeldt and Rampini, 2006).

Barlevy (2002) finds that, empirically, jobs created in recessions are likely to be low-paid and temporary. To explain this “sully” effect of recessions – as opposed to the “cleansing” ef-

fect mentioned above – he shows that while recessions do destroy some inefficient job matches, firms also post fewer job vacancies during recessions and, as a result, workers move more slowly toward their most productive job match. More specifically, while productivity jumps in the early stages of a recession due to the destruction of inefficient job matches, aggregate productivity falls over the duration of a recession as more inefficient job matches are created during the recession.⁸

Spending on research and development is procyclical not because firms adapt their R&D activities to their cash flow; Barlevy (2007) shows that firms increase the rate of growth of their R&D regardless of their cash positions. Rather, firms are biased toward the short-term return on R&D activities, which leads them to undertake too much R&D in booms at a higher cost than necessary. In the presence of credit market frictions, the scope for making use of recessions to alleviate underlying resource misallocations is

⁸ This could explain the pattern observed by Fernald and Matoba (2009) of currently rising TFP in the U.S.A.

further inhibited in terms of both sectoral reallocation and R&D activities.

Barlevy (2003) argues that in the presence of credit market frictions, reallocation actually directs resources from more efficient uses to less efficient uses, which is likely if more efficient production arrangements are also more vulnerable to credit constraints. In recessions, it is difficult to obtain credit and, as a result, projects that need less credit are undertaken irrespective of their efficiency. This result is corroborated by Hottenrott and Czarnitzki (2008), who find that credit constraints reduce cutting-edge R&D activities which are most likely to boost productivity growth, while they do not reduce “routine” R&D activity. In Aghion et al. (2005), long-term productivity-enhancing investment has a higher liquidity risk than short-term investment as it takes longer to complete. With credit constraints, such long-term investment turns procyclical, implying lower mean growth for a given total investment rate. Aghion et al. (2008) use French firm-level data to show that in recessions the share of R&D in investment falls in the presence of credit market frictions, and does not increase proportionally during upturns.

In Austria, a micro-level study (Falk and Hake, 2008b) shows that in particular young firms (those which have been in existence for under 10 years) are credit-constrained with respect to their innovation activities. Public direct subsidies and venture capital alleviate these credit constraints. The impact of the crisis can be seen from two angles. On the one hand, bank loans are of little relevance for young technology-intensive firms without substantial collateral; even before the cri-

sis, such firms never had access to “cheap money” and always faced difficulties in raising external finance, even in times of very low risk premiums. On the other hand, however, they will suffer from a drop in the supply of venture capital, which was already low before the crisis.⁹ This is to some extent a specifically Austrian problem (see Janger, 2009, for a discussion), which could be alleviated by national policies.

To illustrate the magnitude of the effects, an increase of 1% in domestic and foreign business R&D spending leads in the long term to an increase of between 0.3% and 0.6% in TFP in Austria (Falk and Hake, 2008a). When GDP falls by 1%, business R&D spending falls by 1.7% (Bundesministerien, 2009). The OeNB forecast for Austrian GDP for 2009 is -4.2%. This would imply a reduction of approximately 7% in R&D spending, leading to a decrease of between 2.1% and 4.2% in the level of TFP in the long term, if the effects on productivity in recessions are symmetric to the effects in upturns. Of course, these figures are purely illustrative and cannot be taken at face value, but they confirm the point that recessions matter for R&D and for TFP growth.

Other drivers of TFP, such as market entry, are also strongly procyclical (Bilbiie et al., 2007). Access to finance reinforces this pattern: Aghion et al. (2007) find that access to finance matters most for the entry and the post-entry growth of small firms and in sectors that are more dependent on external finance. Skill acquisition, however, is found to be countercyclical (Dellas and Sakellaris, 2003). A worldwide boost in TFP could be brought about by a change in the career choices of sci-

⁹ *Venture capital is strongly procyclical (Romain and van Pottelsberghe, 2004).*

ence and technology graduates: Instead of choosing careers in finance, where they might contribute to negative externalities and reduced potential output, they could boost research capacities around the world. The countercyclical effects of skill acquisition only work in the medium to long term, however; in the short term, the contribution of human capital to TFP may be reduced by long periods of unemployment which destroy human capital. In Austria, some features of the education system render it difficult to make full use of the available potential (OECD, 2009c).

In order to assess the immediate impact of the crisis more closely, we tried to establish a picture of real-time innovation activities. Interviews with leaders of small hi-tech firms¹⁰ and newspaper articles convey the impression that a large amount of short-term optimization and sectoral reallocation is taking place, e.g. suppliers of products which help big firms to save costs are actually growing during the crisis. Innovation pressure not least due to competition from Asia is as strong as ever.¹¹ The semiconductor manufacturer Infineon believes that the industry will look different after the crisis. In addition, data from the Austrian research promotion agency FFG show that the participation of firms in longer-term, riskier programs has declined, whereas smaller-scale programs are on the rise. As in the models constructed by Barlevy (2002) and Aghion et al. (2005), *ceteris paribus* this anecdotal evidence seems to point to productivity gains in the short term, but to a reduc-

tion in efforts to increase productivity further in the long term.

As with the other determinants of potential output, misguided policies can reinforce the impact of the crisis. In Japan, the political and regulatory response to the large drop in stock and land prices from 1989 to 1992 was denial. As a result, large banks often kept credit flowing to otherwise insolvent borrowers to avoid writing off the capital which they needed to comply with regulatory minimum capital requirements. In effect, the competitive process was suppressed, and industries with a high share of *de facto* insolvent borrowers experienced low productivity growth (Caballero et al., 2008).

What are the prospects for productivity growth over the medium to long term? For the U.S.A., there are several “structured guesses” (Oliner and Sichel, 2002), which focus mainly on the contribution of information technologies to future productivity growth, from the perspective of both IT-producing and IT-using industries. Jorgenson et al. (2008) are optimistic, projecting that the increase in U.S. productivity growth witnessed since 1995 will persist, due to both the effects of IT and the favorable business environment in the U.S.A. (flexible labor markets, competitive product markets and deep capital markets). Gordon (2008), by contrast, believes that most of the benefits of IT have already been reaped and projects that productivity growth will be more in line with the values recorded in 1987 to 1997.

In our view, this discussion is backward-looking and overlooks several im-

¹⁰ See some of the discussions held in the Technology Forum within the European Forum Alpbach (2009).

¹¹ At the international level, the Federal Reserve Bank of San Francisco compiles the Tech Pulse Index, a measure that attempts to track real-time economic activity in the U.S. information technology sector (FRBSF, 2009). This index suggests that the IT sector has been affected less severely by the current downturn than by the downturn in 2001 (which, however, hit the IT sector particularly hard).

portant developments. As Solow (2001) observed, endogenous growth theory leads us “to focus on the analysis of the economic incentives to create new technology.” The challenges posed by the emerging market economies (in particular China), economic mechanisms to limit carbon dioxide emissions, such as a worldwide cap-and-trade mechanism, and the growing scarcity of commodities will considerably increase the incentives for innovation and investment not just in a few sectors, but across the board. The construction, energy and manufacturing sectors will all have to adapt to both rising competition and legislative pressure for innovation.

Overall, we believe that the crisis will have a negative impact on short-to medium-term TFP growth, owing to both the severity of the crisis and financial constraints. However, the medium- to long-term outlook is more positive.

2.3 Historical Experience

There are now several studies on the effect of financial crises on potential output or on output over the medium term, bearing in mind that no other crisis was as severe as the current one. Table 1 presents the estimates of these

studies for output loss over the medium term. The IMF (2009a) and the OECD (2009b) summarize the conclusions of several studies as follows:

- Following banking crises, output growth is depressed and does not rebound to the precrisis trend rate over the medium run, often leading to a permanent loss of output; eventually, growth does return to its precrisis rate for most countries.
- Employment, investment and TFP contribute in roughly equal proportions to the output loss.
- The severity of the crisis as measured by the first-year change in output is a good predictor for the medium-term outcome, as are high investment and saving rates before the crisis.
- The medium-run output loss is not inevitable. Countercyclical monetary and fiscal policies in the short run and structural reforms can help to improve medium-term outcomes.
- Employment losses may not be recovered until 10 years after the crisis.

Many national authorities have already phased in revisions to their output growth estimates until 2010 (on average, a cumulative 2.75 percentage points) (OECD 2009b).

Table 1

A Range of Estimates for Potential Output Loss

	Persistent Output Loss	Persistent Potential Output Loss
	%	
Cerra and Saxena (2008)	4–16	x
Furceri and Mourougane (2009)	x	1.5–3.8
Cecchetti et al. (2009)	9.2	x
IMF (2009a)	10	x
Kim et al. (2005)	1.25–5.25	x
IMF (2009b) for the U.S.A.	x	5.75

Source: Cited studies.

Note: Cecchetti et al. (2009) reports averages. IMF (2009a) reports averages after seven years. Kim et al. (2005) considers only recessions without financial constraints. IMF (2009b) estimates the potential output loss by 2014.

The European Commission (2009) and Haugh et al. (2009) contrast the experience of Finland and Sweden with Japan's lost decade to make the point that policies matter for output growth over the medium term following a large financial crisis. While Finland and Sweden experienced a strong rise in structural unemployment after their crisis in the early 1990s, they quickly resolved their banking problems, which, together with policies aimed at structural change, accelerated reallocation and productivity growth. They were also to some extent lucky, as the external environment was favorable and they specialized in the booming IT sector. Japan prevented sectoral reallocation by failing to resolve its banking problems, which led to a long-lasting deterioration in productivity performance. TFP growth can thus be seen as pivotal in reigniting growth after severe crises.

3 How Will the Crisis Affect Potential Output in Austria? A Range of Estimates

The previous sections illustrated Austria's past experience during economic downturns (charts 3 and 5) as well as the past development of various indicators which are crucial in the assessment of potential output. In this section we try to quantify the medium- to long-term prospects for Austria's growth potential. We first analyze the European Commission's (2009) medium-term projections and compute a cumulative loss of potential output up until 2013. We then assess the contribution of a dramatic shock to risk premiums on investment to our assessment of medium-term potential output loss. Further, using the European Commission's QUEST III model, we also project the effects of those shocks to risk premiums on investment 20 years ahead in order to gain an impression of

the long-run consequences of various (mainly policy-driven) scenarios.

3.1 Potential Output in the Medium Term

To gauge the medium-term effect of the current financial crisis, we consider the European Commission's (2009) projections of Austria's potential output. These forecasts were computed following the production function approach of the European Commission's Directorate-General for Economic and Financial Affairs (ECFIN), as described by Denis et al. (2006). The strategy behind this approach is to quantify the supply-side potential of an economy. Assuming Austrian GDP is produced with an aggregate constant returns-to-scale production technology, which combines the factor inputs labor and capital, this amounts to quantifying the potential labor supply as well as the potential capital supply at each point in time. Since neither of these measures are observed, the European Commission (2009) employs the Kalman filter technique to deduce the NAIRU as a measure of structural unemployment, which in turn implies potential labor supply, and uses the perpetual inventory method to quantify the economy's total capital stock at any point in time. As discussed in section 2.2, various issues surround the measurement of any of the components of potential output. The most important caveat to keep in mind when interpreting the data is the following: The European Commission's (2009) estimates of potential output, even for years before the financial crisis, are biased downward through the statistical assumption of mean reverting stochastic processes. This means that an apparent decrease in potential output growth in the years 2005 through 2008 (table 2) is at least in part a purely statistical phenomenon and

Table 2

A Range of Estimates for Potential Output Growth

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2007–2020	2021–2040
	%										
Austria											
European Commission											
Production Function	1.9	1.7	1.6	1.5	1.0	1.1	1.4	1.8	1.8	x	x
HP filter	1.8	1.6	1.4	1.2	1.0	0.9	0.8	0.8	0.8	x	x
Ageing Report	x	x	x	x	x	x	x	x	x	2.1	1.4
OECD											
Economic Outlook	1.7	1.8	2.0	2.0	1.2	0.8	x	x	x	x	x
Euro Area											
European Commission											
Production Function	1.8	1.8	1.8	1.5	0.8	0.8	1.3	1.5	1.6	x	x
HP filter	1.6	1.3	1.0	0.7	0.4	0.1	-0.0	-0.2	-0.2	x	x
Ageing Report	x	x	x	x	x	x	x	x	x	2.3	1.6
OECD											
Economic Outlook	1.5	1.6	1.7	1.9	1.2	0.6	x	x	x	x	x

Source: European Commission (2009). OECD Economic Outlook 85 (2009). European Commission Ageing Report (2009).

need not reflect an actual fall in potential output growth. Table 2 lists the projections of potential output growth conducted by various institutions on the basis of different estimation methods.¹² It can be seen, for instance, that the OECD estimated increasing potential output growth during the period 2005 to 2008, while the European

Commission found a slight decrease in potential output growth even before the onset of the current economic crisis.

In addition to the problem of mean reversion, these estimates are computed with real-time data that could be (and generally are) revised several times in the future, and the “true” data can only be observed several years after the

Table 3

Unemployment versus NAIRU

	2005	2006	2007	2008	2009	2010
	Change in percentage points					
European Commission (2009)						
NAIRU	x	0.2	0.2	0.2	0.4	0.4
Unemployment rate	x	-0.4	-0.4	-0.6	2.2	1.1
WIFO						
Unemployment rate (EU)	x	-0.4	-0.4	-0.6	1.5	0.5
Unemployment rate (AMS)	x	-0.5	-0.6	-0.4	1.6	1.1
European Commission (2009) %						
NAIRU	4.4	4.6	4.8	5.0	5.4	5.8
Unemployment rate	5.2	4.8	4.4	3.8	6.0	7.1
WIFO						
Unemployment rate (EU)	5.2	4.8	4.4	3.8	5.3	5.8
Unemployment rate (AMS)	7.3	6.8	6.2	5.8	7.4	8.5

Source: Eurostat, European Commission (2009), AMS, WIFO.

¹² The annex contains a full table of the contributions to potential growth and the determinants of labor and capital accumulation as calculated by the European Commission.

forecasting exercise. For instance, as already discussed in section 2.2, the European Commission's (2009) data on unemployment for the most recent years diverge significantly from those of the Austrian employment service, AMS, as well as the most recent projections by Austrian Institute of Economic Research (WIFO) for unemployment for 2009 and 2010 (both the AMS and the EU definition; see table 3). Furthermore, the Austrian NAIRU estimate rises throughout the whole period 2005 to 2010, while actual unemployment rates fell from 2005 through 2008. This clearly reflects the "end point problem" of trend filters based on stationary time series. Table 3 illustrates that the unemployment rate of 6% in 2009 (May forecast) pushes up the trend estimation from 2006 to 2008. With those caveats in mind, we try to assess the medium-term growth prospects of the Austrian economy based

on the European Commission's (2009) potential output estimates.¹³

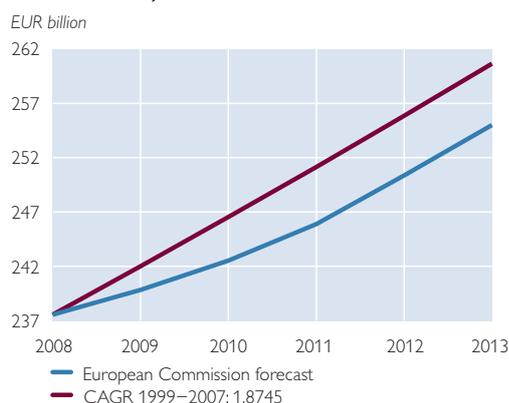
In order to quantify the medium-term effect of the financial crisis, it is useful to examine the deviation of potential output growth from its long-run trend growth. This thought experiment is called an impulse response function, defined as the difference between the expected path of the variable of interest, given that the crisis took place, and the expectation conditional on the crisis not having happened.

The left-hand panel of chart 7 plots these two conditional expectations, where the expected path conditional on the crisis not having happened is proxied by a projection based on the compound annual growth rate from 1999 to 2007 (CAGR 1999–2007 = 1.87%). Of course, the choice of proxy for the "steady state" growth rate, with which we compare the medium-term projections, crucially influences the eventual

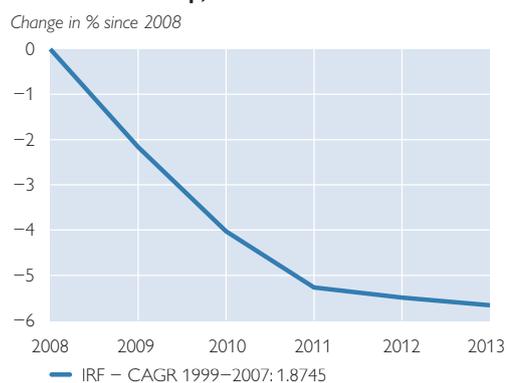
Chart 7

Medium-Term Projections

Potential GDP, real



Potential GDP Gap, real



Source: European Commission's Directorate-General for Economic and Financial Affairs (ECFIN).

Note: The left panel shows the European Commission (2009) projections of GDP in comparison to a projection using the precrisis (1999 to 2007) annual compound growth rate (CAGR; 1999–2007 = 1.87%) as deviations in EUR billion from the 2008 level. The right panel illustrates the difference between the two as percentage deviations relative to 2008 (impulse response function).

¹³ There are two reasons for the choice of estimates: First, the European Commission's (2009) estimates are the official EU statistics, and second, the projections range up until 2013, which allows us to conduct a medium-term assessment of the impact of the economic crisis on potential output.

loss in potential output. We consider this particular horizon for our “steady state” proxy in order to capture Austria’s average growth performance in the period between the establishment of monetary union and the onset of the financial crisis in the U.S.A.¹⁴ This pre-crisis average is illustrated in the right-hand panel of chart 1.

Chart 7 clearly illustrates that the response to the current economic crisis is a drastic reduction in the growth rate of potential output relative to its precrisis long-run growth path. The cumulative percentage deviation in 2010 is projected to be around -4% . Given the current projection for potential output, the output loss by 2013 would be as high as -6% . Even if the estimates are biased slightly downward in absolute value because of the end point problems mentioned above, this forecast suggests the most dramatic fall in potential output since the Great Depression of the 1930s. It is thus crucial to implement adequate policies to prevent a widening of this gap and to support a return to the precrisis potential growth path. To assess the important consequences of structural policy, the following section considers various long-run scenarios in order to quantify the long-run risks and emphasize the significant role of structural policy measures.

3.2 Gauging the Long-Run Effects

Following the European Commission (2009), we make use of its QUEST III model (Ratto et al., 2009) to simulate various scenarios for plausible long-run

effects of the current financial and economic crisis on Austria’s potential GDP.¹⁵ In particular, we focus on shocks to the risk premium on physical investment, motivated by a significant increase in the spread between yields on European corporate AAA- and BBB-rated bonds. The left-hand panel of chart 8 depicts this indicator from April 1999 to June 2009. We focus on European rather than Austrian corporate bonds, since there are not enough data available on the local bond market and, more importantly, we believe that the market for such assets is well integrated across Europe. As illustrated in chart 8, average corporate bond spreads from April 1999 to June 2007 were about 110 basis points, rising rapidly to levels of around 300 basis points thereafter.

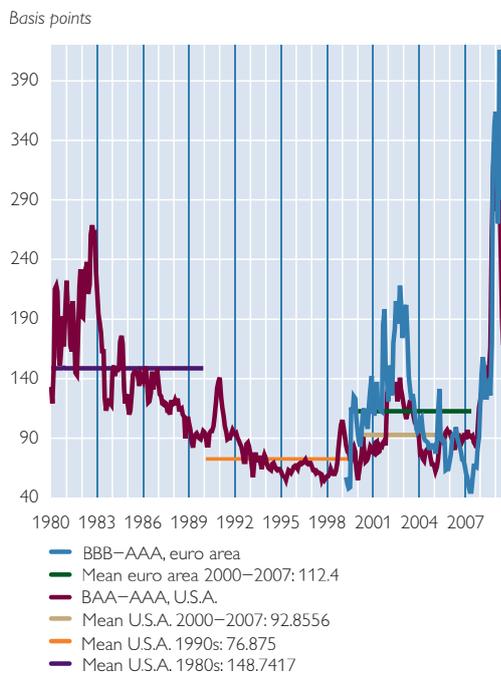
For our QUEST III simulations, this translates into an initial 200 basis point increase in risk premiums on investment relative to the precrisis steady state. As well as quantifying the initial impact, in order to form a picture of plausible long-run scenarios, we also have to take a decision on the plausible long-run paths of these risk premiums. For instance, it is very unlikely that risk spreads will remain as elevated as in the period from 2008 through 2009, but it is also far from clear whether they will eventually revert to (all-time low) precrisis levels or whether a less pronounced (but still permanent) level shift in risk premiums will prevail. Since euro area bonds can only be tracked back until 1999, the left-hand panel of chart 8 additionally plots

¹⁴ As can be seen in table 2, the choice of estimate for potential output is also significant. For instance, average potential output growth between 1999 and 2007 as estimated by the OECD economic outlook is somewhat higher, at around 2%, which seems more realistic in the light of the statistical biases discussed above. However, since we are using the European Commission’s (2009) projections up until 2013, we also compute our proxy for the “steady state” growth rate from the same time series in order to ensure consistency.

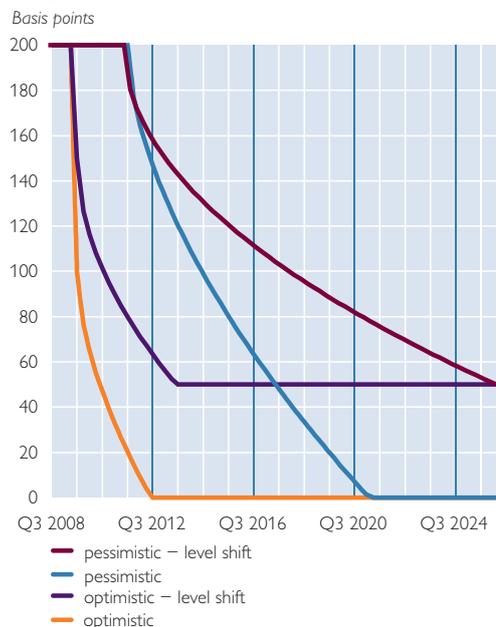
¹⁵ The QUEST III model is a modern monetary DSGE model which includes risk premiums on various forms of capital. The European Commission has estimated (and calibrated where appropriate) the structural parameters of the model for Austria. We use those parameterizations to simulate possible scenarios for potential output.

A Shock to the Risk Premium on Investment

Corporate Bond Spreads



Long-Run Scenario



Source: St. Louis Fed, Thomson Reuters, Authors' calculations.

Note: The left panel plots the spread between yields on European BBB and AAA corporate bonds as reported by Thomson Reuters for the euro area and spreads between BAA and AAA corporate bond yields as reported by the St. Louis Fed for the U.S.A. For both series we also compute selected long run averages. The right-hand panel depicts four long-run shock scenarios which were considered for QUEST III simulations of shocks to the risk premiums on tangible as well as intangible (R&D) investment.

spreads between yields on BAA- and AAA-rated U.S. corporate bonds, for which a significantly longer time series exists. The strong correlation between the two time series for the overlapping period allows us to consider relative movements in U.S. risk spreads as a reasonable proxy for the corresponding movements in European premiums on risky investment. In the U.S.A., the “Great Moderation”, extensive deregulation and a rise in the number of new and creative forms of investment led to a continuous fall in risk spreads throughout the 1990s, e.g. on average risk premiums in the 1980s were about 50 basis points higher than in the period from 2000 to 2007 (chart 8).

In accordance with the suggestive evidence above, we run QUEST III simulations for the following four hypothet-

ical paths of risk premiums on both tangible and intangible (R&D) investment:

- (1) a pessimistic scenario in which the risk premium stays elevated at 200 additional basis points for three years and only slowly reverts to a level 50 basis points above the former average in 2026;
- (2) a slightly less pessimistic decline after three years, with levels eventually returning to the precrisis average in 2020;
- (3) a more optimistic version, where the reversion starts after only one year and the risk premium returns to a level 50 basis points above the precrisis average in 2013; and
- (4) the most optimistic scenario, in which spreads start to fall after one year and eventually return to the precrisis average already in mid-2012.

The hypothetical paths of each shock are illustrated in the right-hand panel of chart 8.

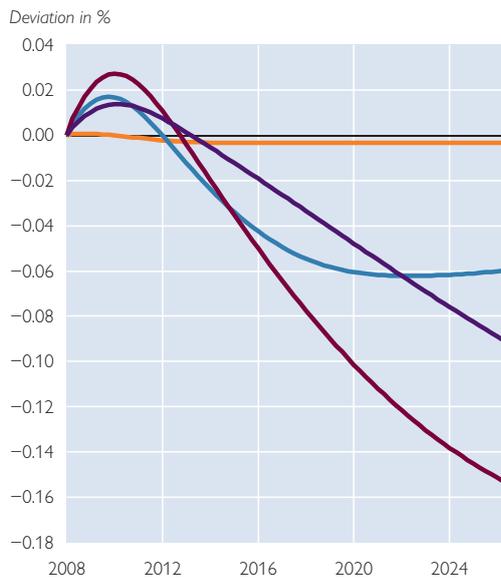
Chart 9 shows the impulse responses of Austrian potential GDP and

investment growth, as predicted by QUEST III, corresponding to the four hypothetical paths of risk premium shocks. It can immediately be seen that the particular path of risk premiums

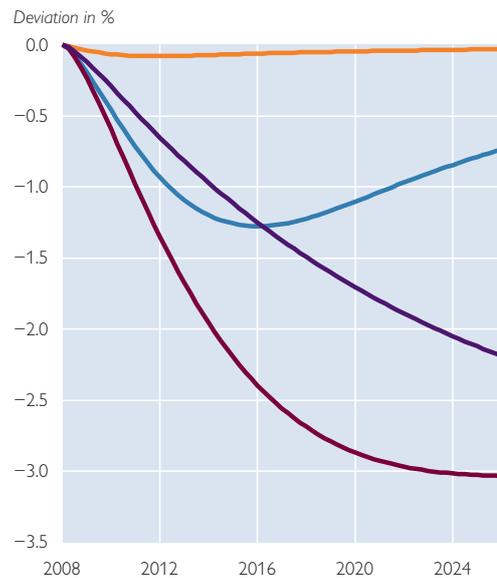
Chart 9

QUEST III: Long-Run Effects of a Risk Premium Shock

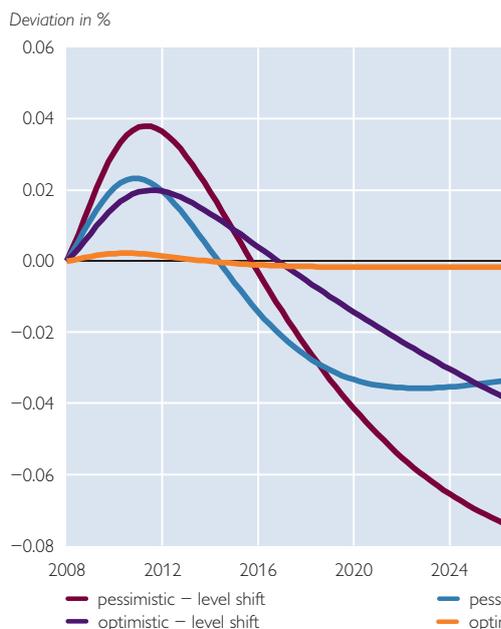
R&D Shock: Potential GDP



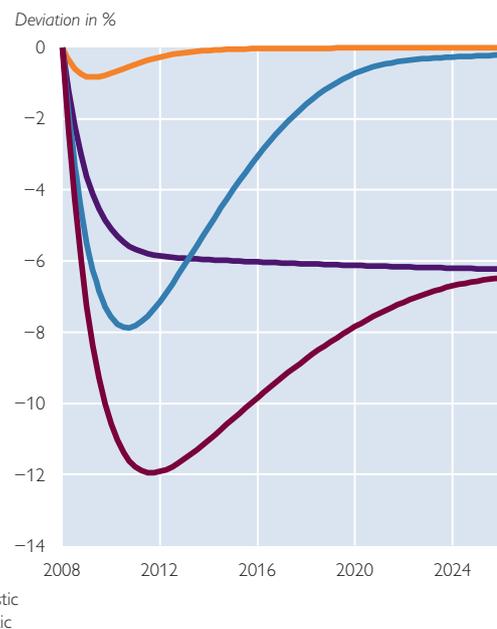
Investment Shock: Potential GDP



R&D Shock: Real Investment



Investment Shock: Investment



Source: Authors' calculations.

Note: The right-hand panel depicts impulse response functions generated by QUEST III simulations for the four shocks to the risk premium on physical capital investment illustrated in the right panel of chart 8. The left-hand panel plots impulse responses to the same types of shocks to the risk premium on R&D investment. Our measure of potential output within the QUEST III model is derived by the formula $OS_YPOT(t) = \exp\{\ln(OS_Y(t)) - OS_YGAP(t)\}$.

has significant long-run consequences for both the level and the growth rate of potential GDP and real investment. The faster confidence in financial markets is restored, the more rapidly investment activity will return to its precrisis level. Further, depending for instance on future financial regulation, the eventual long-run level of risk premiums will determine whether potential GDP returns to its precrisis level or whether a permanent level shift will result.

The chart also shows that the shocks to R&D investment have a very insignificant influence, with a maximum fall in potential output growth of about 0.15%, while the shocks to physical investment may lead to a 3% decrease in potential output growth relative to precrisis steady-state growth rates. In addition to the fact that risk shocks to R&D investment have less of an impact on long-run potential growth rates, it is

unlikely that R&D investment will shrink significantly in the medium to long term, considering current developments regarding climate change and the trend toward energy efficiency (section 2.2).

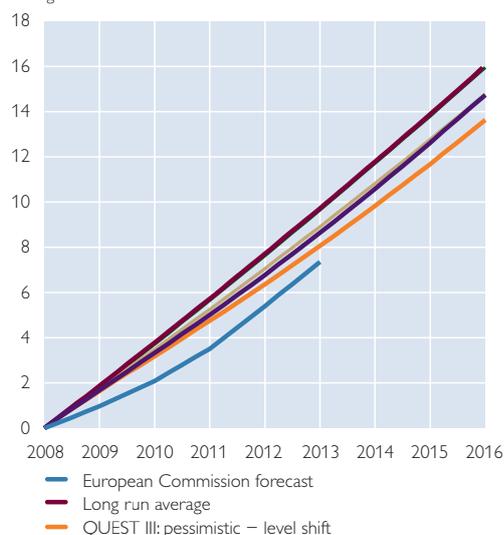
Chart 10 compares the QUEST III simulations of pure risk premium shocks to physical investment and the European Commission's (2009) medium-term projections discussed in section 3.1. As noted in section 1, standard DSGE models use a different concept of potential output from the one employed in the European Commission's medium-term projections. Unlike standard DSGE frameworks, however, the QUEST III model incorporates a (statistical) notion of potential output that is equivalent to the one considered in the production function approach. Therefore, we can meaningfully compare our QUEST III scenarios to the impulse responses constructed

Chart 10

QUEST III Scenarios and ECFIN Medium-Term Projections

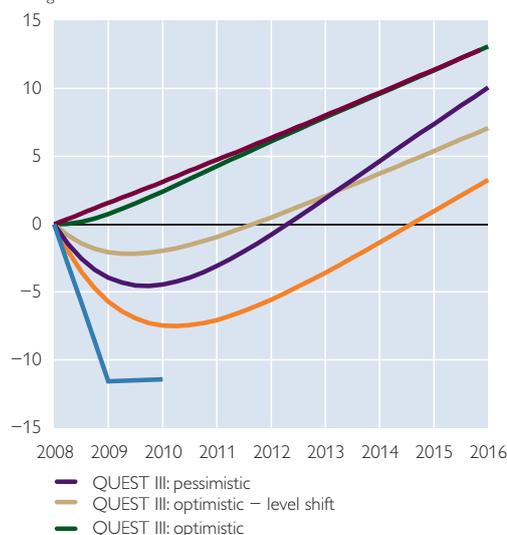
Potential GDP

Change in % since 2008



Investment

Change in % since 2008



Source: ECFIN, authors' calculations.

Note: The charts depict a comparison of QUEST III simulations of the shocks specified in the right panel of chart 8 to the risk premium on tangible investment and the European Commission's medium-term projections. Here we treat the QUEST III shock as if it had occurred in the first quarter of 2008.

from the European Commission's medium-term projections for Austrian potential output.

Note that shocks to the risk premiums alone, if severe enough, are able to explain most of the potential output loss over the medium term. In the short run, however, factors such as the severity of the recession seem to be the main determinants of the medium-term effect of increased risk premiums, which mainly has an impact through long-run investment behavior.

This leads us to two important observations: First, the financial impulse has severe negative consequences for the real economy that go far beyond the effects of a (*ceteris paribus*) shock to risk premiums on physical investment on their own. Second, on the one hand, a (*ceteris paribus*) risk premium shock alone can explain a significant part of the medium-term potential output loss if confidence in financial markets cannot be restored quickly. On the other hand, in the most optimistic scenario, in which confidence in financial markets is completely restored as early as 2012, the shock to risk premiums in isolation does not have any lasting effect whatsoever. Realistically, neither of these two extreme scenarios is very likely, since at least some form of stricter financial regulation can be expected,¹⁶ which will eventually be priced in by market participants, and a moderate level shift in risk premiums seems plausible. However, the financial restructuring and tighter market oversight by regulators should reinforce a quick return to confidence. We thus consider the optimistic scenario with a 50 basis point level shift to be the most realistic long-run scenario for Austria.

A comparison of our QUEST III simulation results with those of the European Commission (2009) shows that the reaction of the Austrian economy to the financial crisis is somewhat smaller in size than that of the overall euro area estimates. There are several reasons for this. First, the full QUEST III model for the euro area explicitly models spillover effects across all EU Member States. The version calibrated to match the Austrian economy does not take these spillovers into account and the resulting projections are thus likely to be biased somewhat downward in magnitude. Second, some of the other EU countries (e.g. Spain, Ireland and France, which experienced major housing bubbles) were hit considerably harder by the financial crisis and hence push up the EU average. Third, the European Commission (2009) simulated a combination of risk premium shocks to physical investment, as well as housing investment and house prices, while the Austrian version of QUEST III does not explicitly allow for an analysis of the housing sector and these shocks could thus not be taken into account. However, since the housing market in Austria has not been affected too severely, compared with that of other European countries, this omission most likely does not bias our projections too much. Nevertheless, this should be taken into account as another potential reason for a downward bias (in magnitude) of the overall effects. Keeping these potential biases in mind, we believe that our simulations are broadly consistent with the euro area evidence, especially since the shape of the impulse response functions is completely identical and the only difference is in terms of magnitude.

¹⁶ We expect stricter market regulations in the banking sector since we believe that policymakers will want to avoid following the Japanese example (Caballero et al., 2008) of a prolonged slump after a financial crisis.

4 Conclusions and Outlook

We estimate that the potential output loss could amount to approximately 4% by 2010, and could rise as high as 6% by 2013 (production function approach according to Denis et al., 2006). The output loss would be slightly greater if the “true” precrisis path of trend potential output were higher. This is in line with current labor market figures, which suggest a smaller increase of the NAIRU than projected by the European Commission (table 3). Like the European Commission (2009), we believe that a permanent level shift in potential output is most likely, i.e. that the output loss due to the crisis will never be recovered, but that the growth rate of potential output will return to its precrisis level after a period of transition, until the effects of an aging population set in by about 2020. This also means that actual growth rates in the recovery will not be as high as is usual after recessions. The policy implications of this scenario will be discussed in Grossmann et al. (2009). Of course, many methodological problems and uncertainties about the real course of events are attached to these projections. Of crucial importance will be the short- to medium-term path of actual output growth, as it is difficult to differentiate between the effects of a prolonged period of subdued aggregate demand and reduced potential output.

A quick V-shape emergence from the recession seems unlikely, as deleveraging and the problems in the financial sector will have some lasting effects, and the next oil price shock may not be far away (IEA, 2009). In the light of both theory and evidence on the impact of severe recessions on TFP growth, the statistical trend method for projecting TFP growth is probably too optimistic in the medium term. A worldwide, sustained recovery will

most probably require an increase in U.S. net exports and a corresponding decrease in the rest of the world, in particular Asia. This will be difficult to achieve (Blanchard, 2009). In a pessimistic scenario, the effects of the crisis may seamlessly link with the effects of population aging on potential output, implying a fall in trend potential output growth to about 1.5% by 2030. This would reduce the policy space available (the window of opportunity) to counter the effects of aging through productivity-raising reforms.

On the upside, current financial indicators show that financial constraints are not as bad as feared following the collapse of Lehman Brothers in 2008. Medium- to longer-term TFP growth prospects are rather positive: In our view, the current discussion on potential output growth too often has a short-term or backward-looking focus, trying to gauge the effects of ICT on productivity, when very powerful economic incentives to innovate and to invest arise from anti-climate-change policies, energy scarcity, new smart power and telecommunications infrastructure, as well as the increasing competition and growing demand from emerging markets. In an optimistic scenario, by 2011 most of the structural effects of the crisis will have disappeared and productivity growth will accelerate by 2020 to compensate for declining labor input, stabilizing the path of potential output at around 2%.

The final outcome crucially depends on the economic policies implemented worldwide and in Austria. The Great Recession may lead to policies which further reduce potential output or it may instead foster breakthrough reforms.

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Annex

Table 4

European Commission's (2009) Projections of Austrian Potential Output Growth

	Actual output growth (annual change in %)	PF Potential Growth	Contributions to potential growth					Determinants of labor potential and capital accumulation			
			Total labor contribution (hours)	Labor contribution (persons)	Changes in hours (per employee) contribution	Capital accumulation contribution	TFP contribution	Growth of working age population (annual change in %)	Trend participation rate (% of working age population)	NAIRU (% of labor force)	Investment ratio (% of potential output)
%											
1981	-0.1	2.3	-0.3	0.1	-0.4	1.2	1.4	1.4	72.1	1.7	23.6
1982	1.9	1.9	-0.4	0.0	-0.4	0.9	1.3	1.3	71.4	1.9	21.2
1983	3.0	1.7	-0.4	-0.1	-0.3	0.8	1.3	1.1	70.7	2.2	20.8
1984	0.1	1.8	-0.3	-0.0	-0.3	0.8	1.3	1.0	70.2	2.4	20.4
1985	2.5	1.8	-0.3	-0.1	-0.3	0.9	1.3	0.5	69.9	2.6	21.3
1986	2.3	1.9	-0.3	-0.0	-0.2	0.9	1.3	0.3	69.8	2.8	21.3
1987	1.3	2.1	-0.1	0.1	-0.2	0.9	1.3	0.1	70.0	2.9	21.7
1988	2.9	2.4	-0.0	0.2	-0.2	1.0	1.4	0.1	70.2	3.0	22.7
1989	3.7	2.8	0.3	0.5	-0.2	1.0	1.4	0.4	70.6	3.1	23.2
1990	4.2	3.0	0.4	0.7	-0.3	1.1	1.5	0.7	70.9	3.2	23.8
1991	3.3	3.1	0.4	0.8	-0.4	1.2	1.5	0.9	71.1	3.3	25.0
1992	1.9	2.8	0.1	0.7	-0.6	1.1	1.5	1.0	71.3	3.4	24.3
1993	0.4	2.2	-0.3	0.4	-0.7	1.0	1.5	0.7	71.3	3.5	23.6
1994	2.2	1.9	-0.7	0.1	-0.8	1.1	1.5	0.2	71.3	3.5	24.4
1995	2.5	1.8	-0.8	-0.0	-0.7	1.0	1.5	0.0	71.3	3.6	24.0
1996	2.2	2.1	-0.4	0.1	-0.5	1.0	1.5	0.1	71.4	3.7	24.6
1997	2.1	2.4	-0.0	0.3	-0.3	1.0	1.4	0.2	71.7	3.7	24.0
1998	3.6	2.5	0.2	0.4	-0.1	1.0	1.3	0.3	71.9	3.8	24.2
1999	3.3	2.6	0.4	0.5	-0.0	0.9	1.2	0.4	72.1	3.8	23.8
2000	3.7	2.6	0.5	0.5	0.0	1.0	1.1	0.5	72.3	3.9	24.5
2001	0.5	2.5	0.6	0.6	0.1	0.8	1.0	0.7	72.5	3.9	23.5
2002	1.6	2.3	0.6	0.6	0.0	0.7	1.0	0.8	72.7	4.0	22.0
2003	0.8	2.3	0.6	0.7	-0.1	0.7	0.9	0.7	73.0	4.1	22.5
2004	2.5	2.1	0.5	0.7	-0.2	0.7	0.9	0.6	73.4	4.2	22.2
2005	2.9	1.9	0.3	0.6	-0.3	0.7	0.8	0.4	74.0	4.4	22.3
2006	3.4	1.7	0.1	0.5	-0.4	0.7	0.8	0.3	74.5	4.6	22.5
2007	3.1	1.6	0.0	0.5	-0.4	0.8	0.8	0.3	75.0	4.8	23.2
2008	1.8	1.5	0.1	0.4	-0.4	0.8	0.7	0.4	75.3	5.0	23.2
2009	-4.0	1.0	-0.2	0.1	-0.3	0.4	0.7	0.4	75.5	5.4	20.4
2010	-0.1	1.1	0.0	0.1	-0.1	0.4	0.7	0.5	75.5	5.8	20.2
2011	×	1.4	0.2	0.1	0.1	0.5	0.7	0.4	75.5	6.0	20.8
2012	×	1.8	0.5	0.4	0.1	0.5	0.8	0.7	75.5	6.1	21.1
2013	×	1.8	0.4	0.3	0.1	0.6	0.8	0.5	75.6	6.2	21.5
Period average											
1981–1985	1.5	1.9	-0.3	0.0	-0.3	0.9	1.3	1.1	70.9	2.2	21.4
1986–1990	2.9	2.4	0.1	0.3	-0.2	1.0	1.4	0.3	70.3	3.0	22.5
1991–1995	2.1	2.4	-0.3	0.4	-0.6	1.1	1.5	0.6	71.2	3.5	24.2
1996–2000	3.0	2.5	0.2	0.3	-0.2	1.0	1.3	0.3	71.9	3.8	24.2
2001–2005	1.7	2.2	0.5	0.6	-0.1	0.7	0.9	0.6	73.1	4.1	22.5
2006–2010	0.8	1.4	0.0	0.3	-0.3	0.6	0.7	0.4	75.2	5.1	21.9
2011–2013	×	1.7	0.4	0.3	0.1	0.5	0.8	0.5	75.5	6.1	21.1

Source: European Commission (http://circa.europa.eu/Public/irc/efin/outgaps/library?!=/spring_2009_forecast/spring_2009_results&vm=detailed&sb=Title).

A Survey on Monetary Policy and Potential Output Uncertainty

Simona Delle
Chiaie¹

This study provides a survey of recent theoretical and empirical works analyzing the implications of imperfect information about potential output for the conduct of monetary policy. Using small-scale New Keynesian models, most of these studies conclude that, under optimal monetary policy, output gap uncertainty leads to persistent deviations between the actual and the perceived output gap in response to supply and cost-push shocks. As a consequence, the monetary policy stance turns out to be systematically looser than under perfect information in periods of large reductions in potential output, and overly restrictive relative to this benchmark in periods of large expansions in potential output. Although these previous studies shed light on the economic mechanisms by which the imprecise measurement of potential output may affect the policy behavior and thus, the dynamics of inflation, their quantitative findings depend on the assumptions about the information set available to the policymaker. In this respect, a useful role for unit labor costs emerges. This indicator provides information about potential output, and it strongly improves the central bank's ability to make stabilization policy more effective.

JEL classification: E4, E5

Keywords: monetary policy, potential output uncertainty, indicator variables, real unit labor costs

In most macromodels that are currently employed for policy analysis, the deviation of actual output from its potential level plays an important role for the implementation of stabilization policies. If potential output measures the economy's capacity to produce goods and services without adding to inflationary pressures, the goal of a stabilization policy should be to keep the economy operating as close to potential as possible. Because potential output is not observable in real time, central banks devote considerable resources to estimating and continually updating their measure of potential output.

In recent years, several authors have highlighted that the imprecise measurement of potential output may have important implications for the conduct of monetary policy. Orphanides (2001, 2003b) claims that the high inflation of the 1970s (the so-called Great Inflation) reflected unavoidable policy mistakes owing to a significant misperception of the state of the economy arising under imperfect information. He ar-

gues that the large productivity slowdown at that time was interpreted for some periods by the Federal Reserve as a negative output gap. This led to an expansionary monetary policy, which aggravated the inflationary impact of potential output decrease. Eventually and after a long delay, the monetary authority realized that potential output growth was lower and adjusted policy to bring inflation down. As a result, the imperfect information about the state of the economy played the critical role in the inflation process.

Cukierman and Lippi (2005) provide analytical foundations for this mechanism within a stylized backward-looking model in which agents do not observe potential output directly. Because of the information problem, the central bank cannot perfectly distinguish between fluctuations in inflation and output that are due to shocks in potential output and those that are due to higher-frequency demand and cost shocks. The authors identify the conditions under which imperfect in-

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formation about potential output leads monetary policy to be systematically looser than under perfect information in periods of large reductions in potential output, and to be overly restrictive relative to this benchmark in periods of large expansions in potential output. The intuitive reason is that, even when they filter available information in an optimal manner, policymakers as well as the public at large detect changes in potential output only gradually. When there is a large decrease in potential output, as was the case in the 1970s, policymakers interpret part of this reduction as a negative output gap due to insufficient demand, and loosen monetary policy too much in comparison to a benchmark of full information. Thus, in periods of large decreases in potential output, inflation accelerates partly because of the relatively expansionary monetary policy stance.

Using a small DSGE (Dynamic Stochastic General Equilibrium) model calibrated to fit annual euro area data, Ehrmann and Smets (2003) show that the welfare loss due to incomplete information about potential output is substantial and mainly results from a significant increase in the variability of the output gap. Even if the central bank continuously updates its estimate of potential output, *ex post* the error in forecasting the output gap is large and very persistent, in particular in response to a shock to potential output.

Although these previous studies shed light on the economic mechanisms by which the imprecise measurement of potential output might affect policy behavior and thus the dynamics of inflation, they have been conducted mainly by means of calibrations (Ehrmann and Smets, 2003; Cukierman and Lippi, 2005). This approach turns out to be not exhaustive, since quantitative find-

ings depend on the particular set of calibrated parameter values. For instance, the size and persistence of the errors in forecasting potential output and therefore the extent to which policy deviates from the ideal full information benchmark depend on the relative variance of potential output and cost-push shocks. Common welfare measures such as the central bank's expected loss and its ability to control inflation, the output gap and interest rate adjustments also depend on the covariance matrix of the shocks as well as weights attached to the central bank's objective function.

Delle Chiaie (2007) studies the robustness of these previous results concerning the monetary policy consequences of the imprecise measurement of potential output by estimating the Ehrmann and Smets (2003) model with Bayesian methods.

Her findings illustrate that the quantitative implications of potential output uncertainty crucially hinge on the information set available to the policymaker. When the information set available to the agents only includes noisy measures of output and inflation, her work corroborates the conclusion by Ehrmann and Smets (2003) that following a potential output shock, the central bank makes a large and persistent error in forecasting the output gap. This error leads the optimal policy to deviate from the benchmark value of full information, creating an effect on inflation which is completely absent in the case of perfect information. However, when monetary policy makes use of the real unit labor cost indicator, potential output uncertainty turns out to have quantitatively negligible consequences on inflation dynamics and on policymakers' welfare.

The results of her study are in line with the findings of Lippi and Neri

(2007) for the euro area. Using a small DSGE model estimated through likelihood-based methods and under the assumption of imperfect information, the authors analyze the information role of the unit labor cost and monetary aggregates. Their results show that unit labor cost contains useful information on potential output that helps to stabilize the output gap target.

The study proceeds as follows. Section 1 reviews the empirical findings in Delle Chiaie (2007). Section 2 concludes.

1 On the Role of Real Unit Labor Costs

Delle Chiaie (2007) studies the implications of incomplete information about potential output for the conduct of monetary policy using a simple backward/forward looking model as in Ehrmann and Smets (2003). The model features three shocks: a shock to potential output, a cost-push shock and a demand shock. She first estimates the model using Bayesian techniques and then uses estimates of the structural parameters and of the monetary authority's objectives to systematically compare outcomes of three different cases.

The first case is one with complete information (CI), which implies that all agents in the economy observe potential output and can therefore perfectly derive the nature of the shocks that hit the economy. In the second case, the central bank and the private sector are subject to incomplete information (II) about potential output. This implies that agents do not observe potential output directly and have to infer the state of the economy on the basis of three noisy indicators: output, inflation and real unit labor cost. Finally, in the

third case, agents are still subject to incomplete information about potential output, but the real unit labor cost indicator is removed from the vector of observables.

Starting with the case in which the real unit labor cost indicator is not available, chart 1 presents the responses of the actual and perceived output gap, the output gap forecast error, inflation and the nominal interest rate following a unitary decrease in potential output. Two main results emerge. First, the error in forecasting the output gap is large and persistent. For about seven quarters, the central bank estimates the output gap as negative while it is actually positive. The origins of such error stem from the fact that the central bank just observes price rises and falls in output but, under imperfect information, does not perfectly recognize whether those effects are caused by a negative potential output shock or a positive cost-push shock (or by a combination of both). As a result, the central bank is forced to assign some probability to the fact that this is actually a positive cost-push shock, which causes it to overpredict potential output. Second, the forecast error causes the optimal interest rate to deviate from the benchmark value under perfect information, leading to a persistent rise in inflation (about 15 quarters) rather than the temporary effect under complete information.

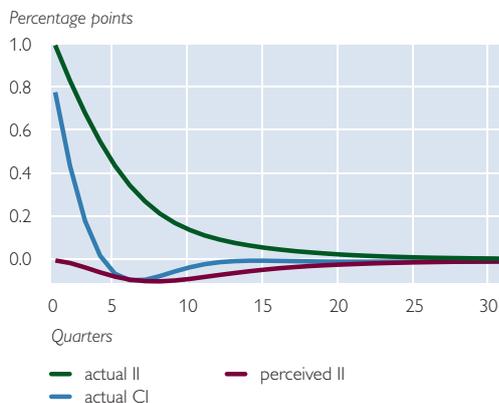
The impulse responses of chart 2 analyze the responses of the variables of interest following a positive cost-push shock.² As a consequence of the signal extraction problem, the central bank assigns some probability to a negative potential output shock hitting the economy, causing an underprediction of

² A cost-push shock could be defined as a shock which captures anything else that might affect expected marginal costs.

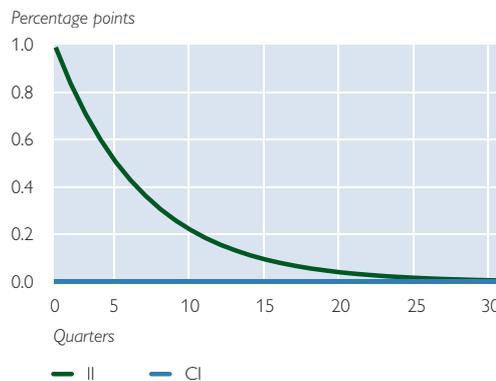
Chart 1

Negative Shock to Potential Output (Real Unit Labor Costs Are not Available)

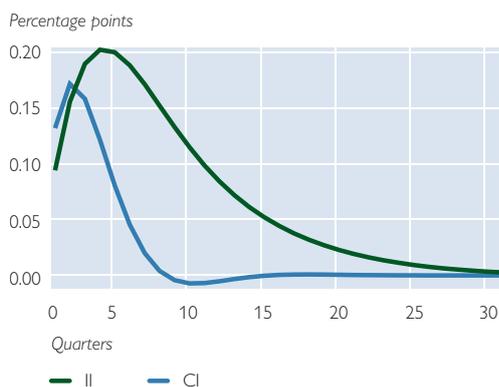
Output gap



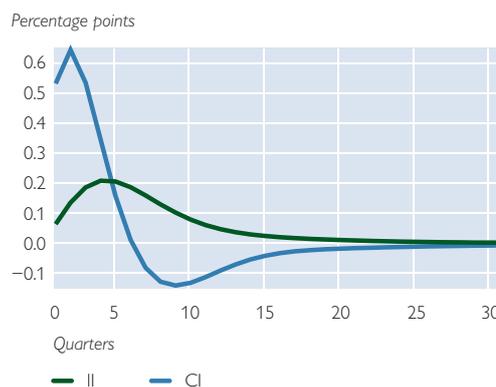
Forecast error output gap



Inflation



Short-term nominal interest rate



Source: Delle Chiaie (2007).

Note: II = incomplete information, CI = complete information.

potential output. Chart 2 shows that following a unitary innovation in the cost-push shock, the central bank overestimates the output gap for about seven quarters. However, since the magnitude of the forecast error is smaller than in the case of a potential output shock, the inflation rate does not diverge substantially from its benchmark of full information.³

Charts 3 and 4 illustrate the responses of the variables of interest when the central bank can infer the level of

potential output based on output, inflation as well as real unit labor cost. The key results of these two charts are that, in both cases, when the real unit labor cost indicator is available to agents, the errors in forecasting the output gap are quantitatively negligible. As a consequence, the optimal monetary policy rule as well as the inflation dynamics completely overlap their benchmarks of complete information.

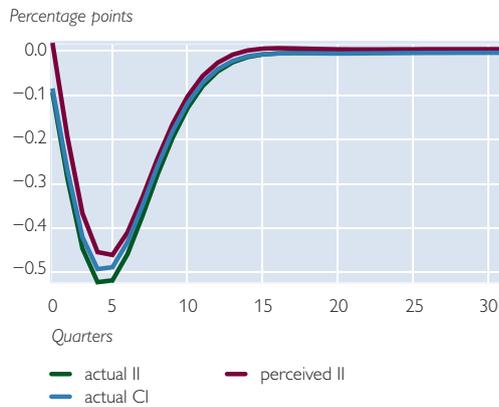
The finding that the forecast error is very small when real unit labor cost

³ Following a cost-push shock, the error in forecasting the output gap is smaller because this shock is estimated to be more volatile than the potential output shock.

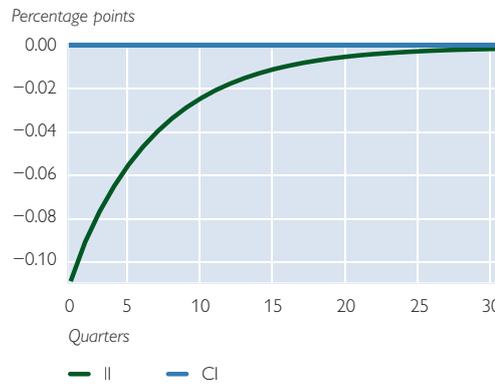
Chart 2

Positive Cost-Push Shock (Real Unit Labor Costs Are not Available)

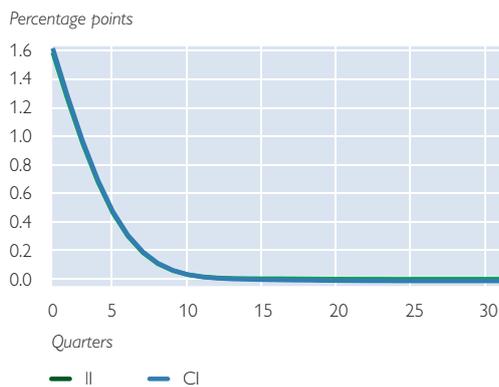
Output gap



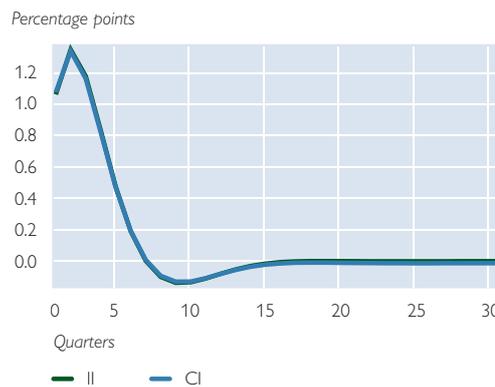
Forecast error output gap



Inflation



Short-term nominal interest rate



Source: Delle Chiaie (2007).

Note: II = incomplete information, CI = complete information.

is employed in estimating the output gap suggests that this indicator contains useful information on potential output. At the same time, this result confirms the objection raised by Galí and Gertler (1999) and Galí et al. (2005) about using detrended GDP (the deviations of

log GDP from a smooth trend) as a proxy for the output gap in empirical applications.⁴

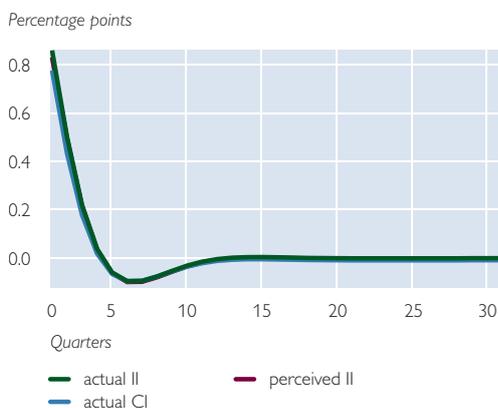
Chart 5 presents an informal assessment of this point based on the patterns of cross-correlations between two alternative output gap estimates and ac-

⁴ The useful role played by the real unit labor cost indicator comes from the fact that it is a better proxy of real marginal cost. In a New Keynesian framework, prices are set as a markup over a weighted average of current and expected future nominal marginal costs. This implies that according to the theory, an important determinant of short-run inflation is given by movements in real marginal cost. As a consequence, this is a theoretically appropriate measure of real sector inflationary pressures, as opposed to cyclical measures used in the traditional Phillips curve analysis, such as detrended GDP or unemployment. This result is well known in the New Keynesian literature (Galí and Gertler, 1999; Galí et al., 2005; Sbordone, 2002) even though it has been discarded so far in the literature analyzing the effects of potential output uncertainty on monetary policy.

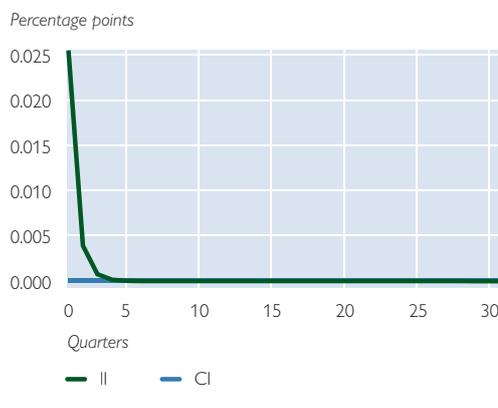
Chart 3

Negative Shock to Potential Output (Real Unit Labor Costs Are Available)

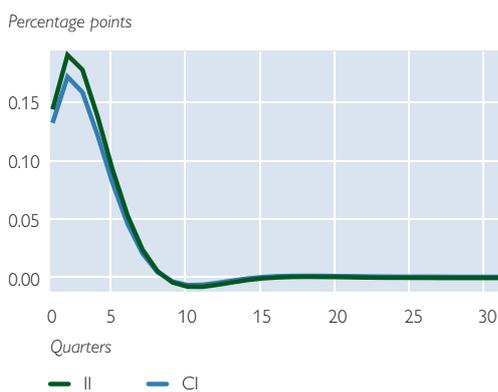
Output gap



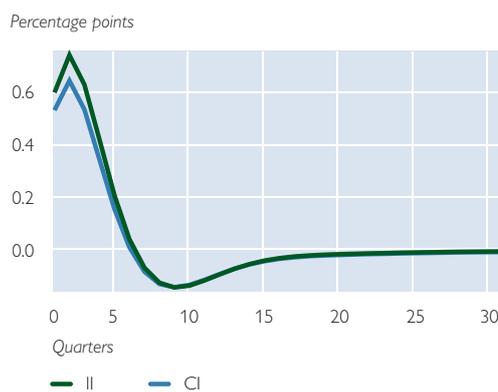
Forecast error output gap



Inflation



Short-term nominal interest rate



Source: Delle Chiaie (2007).

Note: II = incomplete information, CI = complete information.

tual inflation. One output gap estimate is based on detrended GDP and real unit labor cost (green line) while the other, counterfactual estimate is obtained by removing the unit labor cost indicator from the central bank's vector of observables (orange line). A comparison of these two alternative measures of the output gap with actual inflation (blue line) clearly indicates that the output gap series estimated using real unit labor cost presents a higher correlation with actual inflation even though both are positive and statistically significant (0.60 and 0.42, respectively).

Finally, Delle Chiaie (2007) studies the usefulness of the unit labor cost indicator through the effects it produces on some welfare measures.

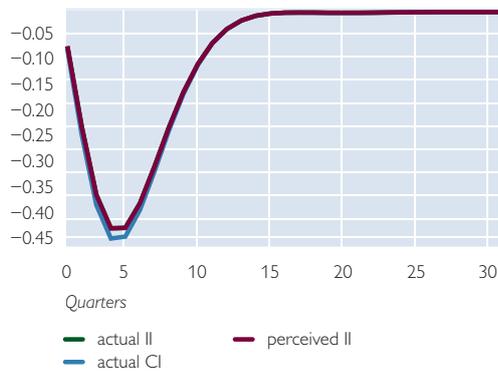
She analyzes how economic performance is affected by the removal of this indicator from the vector of observables. Table 1 reports the standard deviation of target variables (output gap, inflation and interest rate changes) and the central bank's expected loss. The second column considers the case in which all indicators are available to the central bank; the third one shows the values of the standard deviations in the

Chart 4

Positive Cost-Push Shock (Real Unit Labor Costs Are Available)

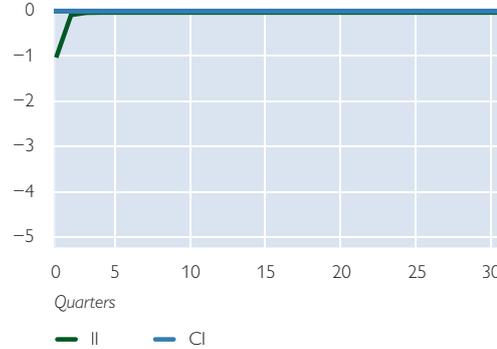
Output gap

Percentage points



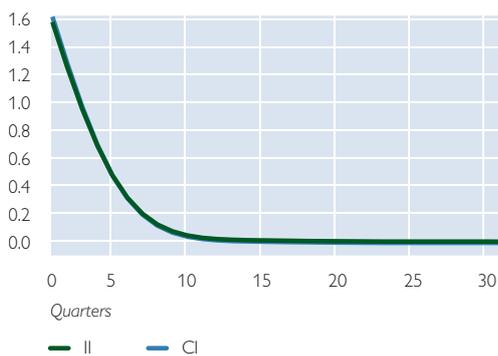
Forecast error output gap

Percentage points; $\times 10^{-3}$



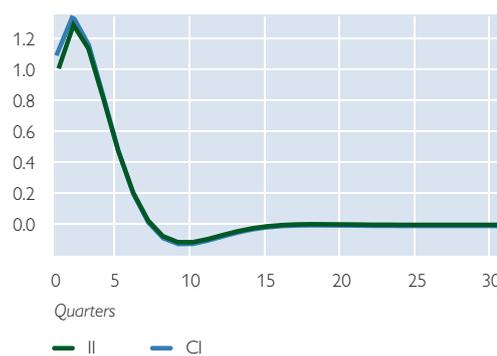
Inflation

Percentage points



Short-term nominal interest rate

Percentage points



Source: Delle Chiaie (2007).

Note: II = incomplete information, CI = complete information.

case in which unit labor costs are eliminated from the central bank's information set.

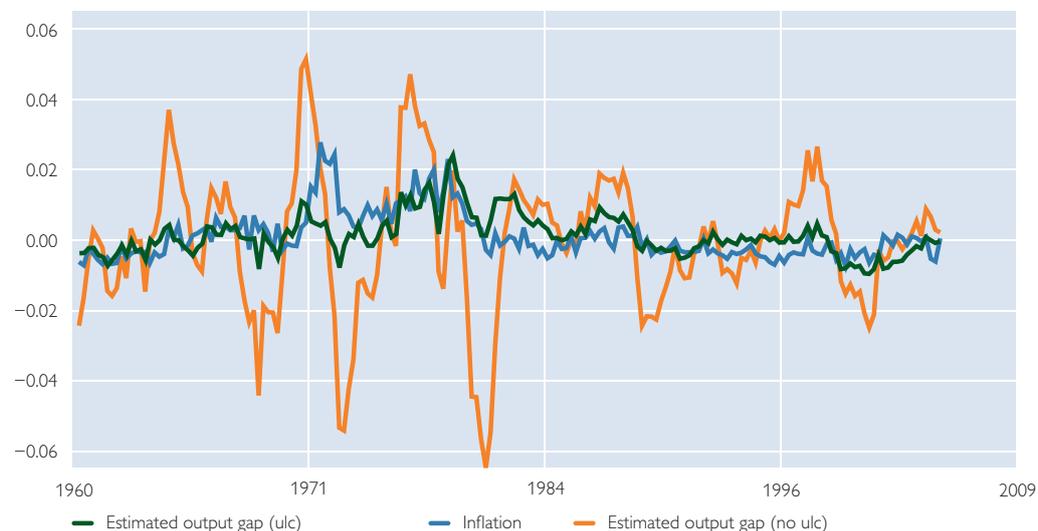
This exercise shows that expected losses increase significantly when unit labor cost is removed from the vector of observables. This effect is mainly due to the increase in the standard deviation

of the output gap. The volatility of interest rate changes, however, declines marginally. This last result could be due to the fact that when unit labor costs are eliminated from the information set, the greater uncertainty about the estimate of potential output causes a reduction in monetary policy activism.

Chart 5

Actual Inflation and Two Output Gap Estimates

Percentage points



Source: Delle Chiaie (2007).

Note: ulc = unit labor costs.

Table 1

Effects of Observing Unit Labor Costs

	All indicators	No unit labor costs
Standard deviation		
Output gap	1.16	1.31
Inflation	1.37	1.37
Interest rate changes	1.03	1.00
% increase in expected losses	×	6.76

Source: Delle Chiaie (2007).

2 Conclusions

In recent years, the implications of imperfect information about potential output for the conduct of monetary policy have been studied more formally in quantitative models of optimal monetary policy. These works have argued that when the policymaker is uncertain about the extent to which fluctuations in output and inflation are due to changes in potential output or to cyclical demand and cost-push shocks, the central bank can make large and persistent mistakes in estimating potential output.

Although these previous studies shed light on the economic mechanisms by which the imprecise measurement of potential output may affect policy behavior and thus the dynamics of inflation, their quantitative findings depend on the assumptions about the information set available to the policymaker. This study shows that when the real unit labor cost is observed or not neglected, the error in forecasting the output gap becomes quantitatively negligible. As a consequence, the optimal policy does not deviate substantially

from its ideal benchmark of full information and, in turn, potential output uncertainty does not produce quantitatively noticeable consequences for inflation dynamics.

The relevance of these findings suggests that some working assumptions are worth further investigation. First, it is important to understand to what extent these results depend on the linear-quadratic framework used. In this context, uncertainty and imperfect in-

formation do not influence the optimal policy because optimal policy is characterized by certainty equivalence. Second, the small DSGE model estimated in Lippi and Neri (2007) and Delle Chiaie (2007) is very simple and therefore potentially misspecified. One extension could be integrating capital accumulation, sticky wages and capital adjustment costs in the analysis. This issue is left for future research.

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Housing Finance of Austrian Households

Nicolás Albacete,
Karin Wagner¹

This study presents a first summary of the housing finance results of the OeNB's Household Survey on Housing Wealth in Austria. 22% of Austrian households have taken out debt to finance housing. The probability of holding such debt is significantly higher for younger and higher-income households than for others. High-income households are much more likely to have a variable rate loan or a foreign currency loan, but at the same time they also have lower loan-to-value (LTV) ratios than the other groups. Regional differences – or more specifically, a west-east pattern – were identified regarding the type and amount of debt incurred: Austrian households in the western provinces tend to have higher debt and higher LTV ratios than those in the eastern provinces. Housing assistance funds and alternative forms of financing, such as inheritances or inter vivos gifts (money), play quite a significant role in housing finance. Austrian households use their property mainly for residential purposes rather than as an investment instrument: Of the households with outstanding housing loans, 74% used (at least part of) the money to purchase their primary residence, 12% used it to finance the deposit they had to make for their housing association apartment, and 17% purchased a second home. 52% of the households that took out a loan to purchase a second property use it for residential or similar purposes, while 26% of them offer it for rent and the remaining households (roughly one-quarter) use it as a store of value. These facts and the existence of a strongly subsidized rental market seem to have contributed to the rather low ownership ratio and the moderate development of Austrian real estate and rental prices by international standards. The differences identified in the structure of housing finance of Austrian households suggest that the impact of monetary policy on wealth (and hence on household consumption and investment) will also differ markedly.

JEL classification: D14, D31, R21, R31, E52

Keywords: household's wealth, real assets, housing finance

Over the past decade, households' housing debt has increased in most euro area countries. The rise in the number of mortgage loans was supported by several factors: comparatively low interest rates, increasing disposable incomes, growing population figures, and deregulation and liberalization trends that pushed up the number of providers, and widened the range, of housing finance products. With interest rates at a historical low, households' interest rate burden remained under control despite the rise in debt, though.

Real estate debt accounts for the lion's share of household debt. Financial accounts data show that in 2007 housing loans accounted for some 61.5% of households' credit liabilities, while consumer loans accounted for 17.5% and "other lending" (e.g. loans to self-

employed persons) for 21%. Therefore, data on real estate holdings and housing finance offer important information for the assessment of a country's housing market, while at the same time providing valuable insights into numerous monetary and economic policy issues (e.g. monetary policy transmission, on consumption and investment, formation of a real estate bubble).

The particular way in which households finance real estate can have a strong impact on the speed and intensity of the transmission of a shock to the economy. The higher e.g. household debt is, the stronger the effects of monetary shocks are, because the pressure on disposable income – and thus also on consumer spending – is higher. The type of interest rate is another factor: Compared with fixed rate loans, vari-

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able rate loans can also accelerate the transmission of monetary shocks to disposable income. Long repayment periods can have the opposite effect, as borrowers can cushion the impact of such shocks on disposable income and thus limit or at least delay the effects of monetary policy decisions. This contribution highlights aspects like risk orientation, collateral for housing loans and possible consequences for the stability of the real estate market and financial stability in Austria at large.

Such analyses are, however, inconclusive without disaggregated data on various household characteristics. Especially the current economic crisis and the developments on the U.S. housing and housing finance market in summer and fall 2007 have underscored the significance of microdata, which provide valuable information e.g. on the distribution and repayment of debt by income groups, thus allowing for more detailed and refined analyses of households' vulnerability than aggregated data do.

This is the first study to evaluate Austrian data on real estate financing at the household level, while at the same time looking into data on loans extended by employers and households to households, which are not covered in the financial accounts. The analysis is based on data compiled from the Household Survey on Housing Wealth (HSHW) commissioned by the OeNB in 2008.

This paper is organized as follows: Section 1 presents the data and defines key variables, while section 2 highlights two aspects of household debt, the determinants of debt and its size on the one hand, and households' associated vulnerability on the other. Section 3

analyzes the characteristics of housing loans taken out by Austrian households and their relevance for monetary and economic policy. Section 4 provides a brief overview and some evaluations of alternative forms of housing finance. Section 5 discusses the role of taxes and subsidies in the real estate sector, and section 6 provides a summary and draws conclusions.

1 Data and Definitions

We use data from the OeNB's 2008 HSHW. The sample covers 2,081 respondents who answered up to 168 questions about their housing wealth and finance, among other things. For general information on the data, see Fessler et al. (2009). Methodological aspects of e.g. sample design and weighting can be found in Wagner and Zottel (2009), and the multiple imputation method we used is presented in Albacete et al. (2009).

In the following, the terms "debt," "loans" and "housing loans" are used synonymously to refer to the sum of all housing loans of Austrian households that were still outstanding as of December 31, 2007. This definition covers loans taken out to finance deposits that were made to housing associations (*Genossenschaftsbeitrag*)² as well as credit to purchase land, which are both captured in the financial accounts. It also covers loans extended by employers or by family or friends, which are not captured in the financial accounts. These data have thus been compiled for the first time for Austria. Loans taken out to finance home improvements and maintenance are not included, as they were not considered in the OeNB's HSHW.

² Upon termination of the rental agreement, tenants receive back the deposit they paid made minus 1% per year.

A household's housing wealth is defined as the sum of any real estate³ the household (co)owns; its value is based on the owners' sales price estimate as of December 31, 2007.

For some evaluations, the wealth and debt definitions mentioned above refer only to primary residences or exclude the financing of deposits for housing association apartments, as no detailed credit data were available for the other categories. Restrictions will be indicated in the individual subsections whenever they apply.

2 Households' Housing Debt

Which households are indebted, which are not? Which households are more heavily indebted than others? Does household debt pose a risk for financial stability? Section 2.1 addresses the first two questions; section 2.2 tackles the last one.

2.1 Determinants of Housing Debt

2.1.1 Debt Rate

The second column in table A1 shows that 22% of Austrian households had outstanding housing loans in 2007. An above-average debt rate is reported for the following households: age group from 30 to 39 years, married, employed, higher education or above-average income level. A breakdown by professions shows that the housing debt rate is highest among civil servants (39%), followed by business owners and self-employed persons, and lowest for farmers, pensioners and nonemployed people. A breakdown by provinces indicates that the number of indebted households is relatively low in Carinthia and Styria and comparatively

high in Vorarlberg and Burgenland. The wealthier (as measured by the interviewers' assessment of the standard of living at the respondents' primary residence) a household seems to be, the more likely it is to have taken out (housing) loans. A look at the various forms of financial investment undertaken by Austrian households substantiates this impression: The highest debt rates are reported for households that hold equity (44%), bonds and mutual fund shares. Households without any common financial assets are indebted rather rarely (13%). As expected, the lowest debt rates are reported for housing association tenants who did not have to make a deposit for their primary residence (5%) and homeowners who inherited their primary residence (14%), while relatively high debt rates are observed for homeowners who purchased their primary residence (46%).

Purchasing a home requires that people are willing and able to incur debt: Our data show that credit seems to be one of the main reasons for people to rent instead of buying: When asked why they did not own their apartment or house, 8% of tenants replied that to do so, they would have to take out a loan but did not want to, and 7% of respondents claimed that banks would not give them a loan.

We use a logit model to estimate the probability of holding debt. Unlike the statistics in table A1, this allows us to control for several variables at the same time and thus identify important determinants of household debt. Table A3 shows that the probability of holding debt rises significantly with income. Age and the square of age have a highly

³ *Coownership is allocated to the respective household on a proportionate basis. In the survey, "property" denotes all types of real property, i.e. apartments, houses, plots of land, fields, forests, etc., including real estate abroad. Private foundations are not covered, but it is highly unlikely that the survey sample contains such a household, as wealthy households tend to be underrepresented in such surveys.*

significant influence, and the probability of holding debt also rises with the education level. Interestingly, households that never received an inheritance are more likely than others to take on debt. The probability of holding debt is much higher for married couple households than for single households.

2.1.2 Size of Debt

The third column of table A1 presents the reported mean and median amounts of household debt, which for many household characteristics follow a pattern similar to that of debt rates: Young, married couple households with high education and income levels hold above-average amounts of debt. The mean value of household debt in Austria is around EUR 77,500. The median value, at EUR 43,000, is much lower, which points to a very uneven distribution of debt amounts (section 2.2).

For some household characteristics, the distribution patterns of debt amounts are different from those of debt rates. A case in point is the breakdown by provinces: In Burgenland, debt amounts are at the lower end of the spectrum, while debt rates are among the highest in Austria; it is the other way round in Tyrol. Another case in point is the type of rental agreement: As expected, households that did not have to pay a deposit for a housing association apartment are indebted markedly less often than those who did (5% as opposed to 20%). At the same time, the first group tends to have larger debt for the purchase of second properties. Another interesting pattern emerges for inheritances: While the debt rate is below average for households that inherited at least (part of) one property (17%) – and thus much lower than for homeowners who

did not inherit a property (43%) – debt amounts are much higher for the heirs group than for the other group (EUR 91,132 compared with EUR 83,114).⁴ Upon closer examination, it turns out that the heirs group has above-average incomes, which probably increases their borrowing capacity.

We also found differences in the households' debt amounts depending on the type of loans they took out. Debt amounts are above average for households with at least one foreign currency loan (as most of these loans are bullet loans, see section 3.7) and households with at least one loan granted by a building and loan association or one bank loan (table A2). By contrast, the amounts are below average for those who have at least one government loan⁵. The choice of loan type, in turn, is correlated with particular sociodemographic characteristics of borrowers (section 3).

In a next step, we conduct a linear regression analysis to estimate the determinants of debt amounts (table A3). It is noteworthy that, after controlling for the specified regressors, neither income, nor education, nor age, nor inheritance turned out to have an impact on debt amounts that is significantly different from zero. In addition, we found that business owners and self-employed people hold significantly higher amounts of debt than nonemployed people, as do households in Vorarlberg compared with those in the other Austrian provinces.

2.2 Financial Situation of Households

Over recent years, the development of household debt and, above all, housing-related debt has raised many questions

⁴ The same goes for *inter vivos* gifts.

⁵ In this contribution, "government loans" are loans granted by the provincial government or other public institutions.

about the credit risk associated with housing finance and about financial stability. These issues have become all the more urgent in the context of the financial crisis. Microdata have turned out to be especially useful to answer these questions, as they provide information on the distribution and repayment of debt and thus allow more detailed and refined analyses of the household sector's vulnerability^{6,7}.

In line with Johansson and Persson (2006), we assign each household in the data set to one of four equally sized income categories. For the further analysis, however, only indebted house-

holds are taken into account, as the others cannot cause housing loan losses and thus do not pose the associated risk.⁸ Table 1 shows some descriptive statistics for the four income categories. It turns out that income, housing wealth and debt size tend to move in tandem.⁹ The correlation coefficients between these three variables show that the correlation of housing wealth with debt amounts is strongest, followed by housing wealth with income. The correlation of debt amounts with income is weakest. Still, all correlations are statistically significant at least at the 5% level.¹⁰ The number of house-

Table 1

Income, Housing Wealth and Housing Debt of Austrian Indebted Households in 2007¹

	Income quartile								Total	
	1		2		3		4		Mean	Median
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Annual income (EUR)	9,166	10,468	19,151	19,200	29,879	30,000	60,239	50,786	35,828	30,000
Housing wealth (EUR)	327,632	150,000	200,647	155,000	212,843	189,237	325,310	245,000	260,311	200,000
Debt amounts (EUR)	71,469	41,866	69,933	32,000	72,655	41,567	89,006	55,000	77,514	42,944
Debt ratio (in % of income)	1,177	449	364	180	250	148	168	91	335	142
Value-to-loan ratio (in % of debt amounts)	1,245	242	1,175	263	933	256	1,929	395	1,352	296
Share of indebted households (in %)	9	0	18	0	30	0	33	0	22	0

Correlation of housing wealth and debt amounts

Pearson correlation: 0.25²

Kendall's tau: 0.25²

Correlation of housing wealth and income

Pearson correlation: 0.08²

Kendall's tau: 0.17²

Correlation of debt amounts and income

Pearson correlation: 0.05²

Kendall's tau: 0.06²

Source: OeNB 2008 HSHW.

¹ Only households with outstanding housing loans.

² Significant at the 5% level or below.

⁶ Vulnerability refers to households that are not able to repay outstanding debt.

⁷ A comprehensive vulnerability analysis of the household sector has to be based on data on the households' total net assets (financial assets, real estate assets, other assets and total liabilities). As our data capture only part of total net assets, the following analysis should be interpreted with caution.

⁸ The default risk for other types of loans, e.g. home improvement loans, consumer loans or loans taken out by self-employed persons, is not included here owing to a lack of data.

⁹ Especially the median values.

¹⁰ These correlations should be regarded as approximations, as they consider only the within variance, but not the between variance of the multiple imputed data set. See Albacete et al. (2009) for further details on the imputations we used in this contribution.

holds varies across income quartiles, as the analysis only considers households with outstanding debt. In the lowest income category, the share of indebted households is 9%. It rises across income categories and stands at 33% in the highest quartile. The value-to-loan ratio¹¹ in table 1 shows that the real estate assets held by the household sector seem sufficient to collateralize its debt: The mean household in each income category has assets worth more than twice as much as the underlying debt.

We use two indicators commonly found in the literature¹² for a better assessment of households' vulnerability: (1) the distribution of debt across

income categories, and (2) the debt-servicing ratios.

(1) Distribution of Debt and Income

Chart 1 shows the distribution of Austrian households' total debt across income categories and these income groups' respective shares in total housing assets. Housing assets are an important constituent of individual households' financial situation, as these assets can be sold to repay debt, if necessary. Indebted households in the highest income quartile account for 39% of the total volume of Austrian households' outstanding housing loans (blue bars). At the same time, they also hold 15% of all real estate assets (red bars). Please note that while the debt shares across all income categories add up to 100%, the shares in housing assets do not, as not all homeowners are indebted. All in all, indebted households own 36% of housing wealth.¹³ The distribution of debt is rather strongly left-skewed. Low-income households account for a small share of total debt, which means that the associated risks for the banking sector are relatively small. It also implies, however, that these households may have only limited access to loans, which can, in fact, give rise to welfare costs owing to lower consumption and investment.

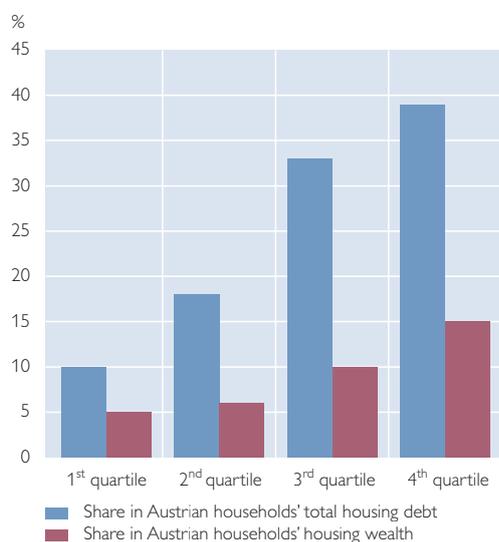
(2) Debt-Servicing Ratios¹⁴

An alternative approach to assessing the vulnerability of an indebted household is to measure the share in disposable income it uses to repay debt. A large share would imply that a household's sensitivity to interest rate and income

Chart 1

Distribution of Debt by Income Groups

Housing Wealth and Housing Debt by Income Quartiles in 2007



Source: OeNB 2008 HSHW.

¹¹ This ratio refers to the households' housing wealth and loans outstanding.

¹² See Gyntelberg et al. (2007).

¹³ This share is perhaps smaller than expected, which is attributable to the fact that this study only considers the most important debt category, namely debt incurred to purchase housing. Still, including households that hold other types of debt (e.g. consumer loans) would lead to a manifold increase in the housing wealth of all indebted households and would thus also boost the share in total real estate assets held by indebted households.

¹⁴ The figures indicated below refer exclusively to primary residence owners, as this is the only group for which data on debt service are available.

fluctuations will be rather high. Chart 2 shows the share in disposable income the median indebted household of each income category use to repay the loans they took out to purchase their primary residence. This share, which is 50% in the lowest income quartile (chart 2), declines continuously in each higher category and comes to 12% in the highest quartile. Accordingly, the distribution of debt-servicing ratios is very strongly right-skewed toward the lowest-income households. A comparison with other countries¹⁵ shows that the values for the lowest-income quartile in Austria are above the 35% mean¹⁶ and roughly equal to the values observed e.g. in Spain (48%) or the Netherlands (54%) in 2005.

In addition to servicing debt, households have to pay for other housing costs, e.g. for electricity or heating. When asked if they had to limit house-

hold spending for food, clothing, vacations, etc. to be able to afford all housing costs, 34% of respondents answered in the affirmative. Chart 2 shows that this reply was given not only by households in the first (lowest) income quartile but also by a disproportionately large number from the second and third quartiles, which suggests that there are vulnerable households also in these income groups. Detailed statements on this issue would, however, require more in-depth information on how much each household spends on housing and its ability to meet its daily needs.¹⁷

3 Loan Characteristics¹⁸

In addition to the outstanding loan amounts, several loan characteristics are also highly relevant for the monetary transmission mechanism and for the associated risks for financial stability. We will focus on the following aspects: type of loan, lender, purpose of the loan, collateralization, maturity, interest rates, repayment and loan-to-value ratios.

Given that one household can have several outstanding loans (chart A1), the figures for individual loan characteristics always refer to households that have at least one such loan. This is why the household percentage shares do not necessarily add up to 100% unless a household has only one outstanding loan.

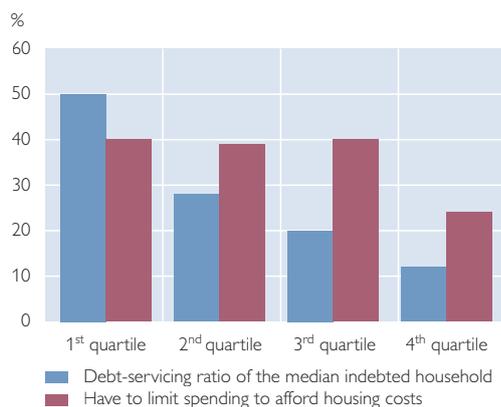
3.1 Type of Loan

The available data allow us to distinguish between loans in terms of collateralization (mortgage-backed loans and

Chart 2

Housing Debt-Servicing Ratio of Austrian Households by Income Groups

Debt Service in Relation to Disposable Income by Income Quartiles in 2007



Source: OeNB 2008 HSHW.

¹⁵ See ECB (2009) for the results of household surveys for Germany, Greece, Spain, Italy, the Netherlands and Portugal.

¹⁶ We calculated the mean value for the countries listed in footnote 15 using data from ECB (2009).

¹⁷ See Albacete and Fessler (2010).

¹⁸ If not indicated otherwise, the figures in this section always refer to loans taken out to purchase the primary residence, as no detailed information was available on the characteristics of any other type of loan.

loans that are not secured by a mortgage) and currency (foreign currency and euro loans). Within the mortgage-backed loans group, we can further distinguish between loans granted by building and loan associations and housing loans granted by the government. In the following, we will examine both types of mortgage-backed loans. The other loan types will be discussed in section 3.4 (mortgage-backed loans) and section 5 (government loans).

Despite the risks involved, foreign currency loans have become very popular in Austria: 29% of all indebted Austrian households have at least one outstanding foreign currency loan. In the fourth quarter of 2007¹⁹ 28% of the volume of outstanding loans to households was in a foreign currency (Swiss franc, Japanese yen) according to the ECB's money and banking statistics. The risks associated with foreign currency loans include (1) exchange rate risk, which means that borrowers have to pay back a higher amount than they received initially if the foreign currency in which the loan was taken out appreciates, and (2) interest rate risk, which means that changes in the economic environment may quickly erode the interest rate advantage of a foreign currency loan against a euro loan or even turn it into a disadvantage. Considering that most foreign currency loans are bullet loans linked to repayment vehicles, performance risk is another factor that is incidentally also relevant for other types of loans (section 3.7). 73% of Austrian households with a bullet loan have at least also one foreign currency loan (table A5).

Table A4 shows that foreign currency loans are especially popular among young households: In the age

group 18 to 29 years, 42% of respondents say their household has at least one foreign currency loan, which is far above the 29% mean. A breakdown by income groups shows that high-income households are much more likely than others to have at least one foreign currency loan (35% in the highest income quartile). Young and rich people seem to be least averse to the risks associated with foreign currency loans. A breakdown by provinces reveals that the share of foreign currency borrowers is by far highest (64%) in the westernmost province, Vorarlberg, which is probably due to the geographical and currency proximity to Switzerland, followed by Upper Austria (46%).

The results of a logit estimation substantiate this outcome: The probability of holding a foreign currency loan increases significantly with rising income and education levels. Employees, civil servants and nonemployed people are significantly less likely to hold a foreign currency loan than business owners. The same is true of single households compared with (married) couple households. A breakdown by provinces shows that households in Tyrol, Salzburg, Lower Austria and Vienna are significantly less likely to have a foreign currency loan than those in Vorarlberg (table A3).

57% of all indebted Austrian households have loans that were granted by a building and loan association. Such loans are highly popular in the youngest age group (18 to 29 years). 89% of debtors in this category have at least one such loan (table A4). No clear pattern was observed for income, though – it seems that (unlike foreign currency loans) this type of loan is also attractive for more risk-averse house-

¹⁹ This was the time when the respondents of the OeNB's 2008 HSHW were asked about their outstanding loans.

holds, as it does not involve exchange rate risk and reduces interest rate risk. Among the Austrian provinces, households from Vorarlberg and Upper Austria again rank first at 76% and 72%, respectively, followed by Vienna, which at 63% is also markedly above the mean value of 57%. Table A5 shows that many households have both types of loans at the same time: 85% of households with a foreign currency loan have also taken out at least one loan from a building and loan association.

3.2 Lender

So far, no data has been available on loans extended to households by employers or other households in Austria, as the financial accounts cover only bank loans and loans granted by the government. This is the first study to present such data.

The survey results show that these alternative lenders play a rather minor role in lending to Austrian households (table A4). A mere 4% of all homeowners with outstanding debt have at least one outstanding loan that was granted by their employer (e.g. advances on salary) or by another household (e.g. family or friends). This compares with 77% holding bank loans²⁰ and 38% government loans. The picture is similar for the total volume of loans outstanding: Bank loans account for 79%, government loans for 17% and loans extended by employers or households for 4%. Taking out loans from employers or households is more customary among homeowners with high education levels, civil servants and farmers, households in rather low in-

come categories, and households in Carinthia, Tyrol and Vienna.

Government loans are more common among older households, while bank loans are more customary among younger ones. Regarding income categories, government loans are more frequently taken out by high-income households, but no specific pattern emerges for bank loans. A breakdown by professions reveals that only 55% of civil servants with outstanding debt have at least one outstanding bank loan. This group seems to finance housing primarily via government loans (67%). The latter type of loans seems to be more common in small municipalities and rural areas, while bank loans seem to be more customary in bigger municipalities and urban areas. Of the Austrian households with outstanding debt, those living in Burgenland and Lower Austria account for an above-average share of government loans, while those in Vorarlberg and Vienna account for an above-average share of bank loans.

3.3 Purpose²¹

According to the survey results, 74% of all Austrian households with outstanding loans took out housing loans to purchase at least one primary residence.²² Households in the age group 30 to 49 years make up an above-average share of these borrowers (table A4). This purpose is far more common in rural areas than it is in cities: The larger a municipality is, the smaller the share of primary residence borrowers among indebted households is. In the capital city, Vienna, for instance, just 37% of

²⁰ Including loans extended by credit institutions like e.g. building and loan associations.

²¹ In this section, we refer to all indebted households (including those who have taken out a housing loan to finance a housing association deposit or to purchase a second property).

²² By comparison, an OeNB housing finance survey conducted among Austrian commercial banks in summer 2008 shows that 83% of new mortgage loans taken out in 2007 were used to finance owner-occupied housing.

indebted households have such a loan. The size of the property also plays an important role: Only 37% of the households with a primary residence up to 65m² took out a loan, while it is 93% of those with housing of 130m² or larger.

12% of indebted households took out a loan to finance a deposit for their housing association apartment. These households tend to be younger than those with a loan to purchase a primary residence, or they have rather lower education levels. Nonemployed people, blue-collar workers or rather low-income earners make up an above-average share, as do people living in large municipalities and urban areas: 28% of households in Vienna and 30% of households in Carinthian municipalities hold such a loan. An above-average share of them live in rather small homes and would like to move somewhere else.

17% of indebted households used at least one of their loans to purchase one or more additional properties. People aged 50+ are especially likely to have taken out a loan for this purpose. In terms of education levels and professions, it is 21% in the group with the highest education level, 29% of civil servants, 25% of self-employed persons and business owners, and 24% of pensioners. As expected, also households with the following characteristics make up an above-average share of second property buyers among households with outstanding loans: highest income quartile, living in Vienna or other urban areas and living in apartments smaller than 65m². Of the households that took out a loan to purchase a second property, 52% use the property for

residential or similar purposes²³, only 26% offer it for rent and 25% use it as an investment.²⁴

Households can secure a loan against their primary residence and use it for purposes other than purchasing real estate. At the time of the survey, this was the case with 24% of homeowners who had taken out a loan at some point in time to purchase their primary residence.²⁵ Such loans can be used to finance e.g. consumption, home improvements, investment or repayment of other debt. Mortgage equity withdrawal, or equity extraction, as this type of financing is also called, is very popular in the U.S.A. Extracting home equity is only possible as long as the current market value of the property is higher than the mortgage debt. Mortgage equity withdrawals increase the liquidity of households' real estate assets, but they also lead to stronger wealth effects caused by interest rate changes. Table A4 shows that an above-average share of young households (51% in the age group 18 to 29 years) and high-income households (28% of the highest income quartile) rely on this type of financing. Salzburg (39%) and Lower Austria (31%) are the two provinces with the highest share of households holding such loans.

3.4 Collateralization

The OeNB's HSHW addressed two types of loans that help increase the probability that lenders' claims are paid: mortgage-backed loans and guarantor loans.

Mortgage loans are very customary in Austria. An overwhelming majority of homeownership households with out-

²³ Residential real property: used as vacation home, relatives live there; plots of land: (additional) usable space, building a house for family or children later on.

²⁴ The sum of all indicated purposes does not add up to 100%, as respondents could select multiple responses.

²⁵ The respective figure for all homeownership households is unfortunately not available.

Rental Market in Austria

A 50% ratio of primary homeowners shows that a strong rental market exists in Austria. It comprises government-subsidized housing and apartments as well as housing rented out by private landlords.

In the following, we will look into the survey data on tenancy arrangements (see also section 5). As many as 30% of all survey respondents (i.e. including those who are not indebted) live in subsidized rental apartments: public housing apartments (*Gemeindewohnung*) or housing association apartments (*Genossenschaftswohnung*). Only 13% of respondents are tenants or subtenants of property rented out by private landlords.

We will focus on homeowners of primary residences and other residential real estate (i.e. excluding land, fields, forests, office space, hotels, business premises, etc.). 56% of all households surveyed own residential property, but how many of them actually live in the houses they own? While 88% of homeowners indicate that they live in one of the properties they own, 7% of homeowners live in government-subsidized buildings or housing association apartments, even though they own a place. The households in our data set own a total of 2,220 residential units. 79% of them are used as a primary residence, 7% are vacation homes, and 4% are inhabited by the homeowners' relatives. Only 5% of residential real estate holdings are rented out. Who are these (comparatively) few private landlords? 43% of them are employees, 22% are civil servants, and 6% are contract employees. The mean age of landlords is 47 years; the other homeowners are slightly older (50 years).

A closer look at the survey data on tenants shows that 34% of tenants have a housing association apartment, and another 26% have a public housing apartment, so that 60% of tenants in Austria live in government-subsidized apartments or houses. Only 30% are tenants or subtenants of homes rented out by private landlords,¹ and 8% of tenants are usufruct holders.

The data from the OeNB's HSHW provide an accurate reflection of the situation in the Austrian rental market. The share of government-subsidized housing is high by European standards. While the eligibility of future tenants is rigorously reviewed before the conclusion of rental agreements, less strict criteria apply when such an apartment is passed down to the next generation.

To sum up, Austrian households purchase and own residential property mainly for their own use, and less for the purpose of renting out or as an investment. There are two main reasons why renting out is not as attractive in Austria as it is in other countries: First, tenant protection laws are rather strict in Austria (e.g. Landlord and Tenant Act – *Mietrechtsgesetz* – and a law cushioning the impact of inflation on housing costs – *Mietrechtliches Inflationslinderungsgesetz*), and second, landlords do not benefit that much from tax relief (e.g. deductibility of mortgage interest payments from taxable income) that apply in several other European countries (e.g. the Netherlands or Spain). These two factors are among the reasons why real estate and rental prices in Austria have developed modestly by European standards. The emergence of a real estate bubble is thus rather unlikely in Austria.

¹ According to 2007 data of residential building statistics by Statistics Austria 46% of apartments or houses are rented out by private landlords and 54% are housing association apartments or public housing apartments. These differences in the data partly reflect different definitions of tenancy types (private, government-subsidized, usufruct rights).

standing debt (90% of them accounting for 86% of the outstanding loan volume) have at least one such loan. Single or divorced homeowners are less likely than the other groups to hold such a loan (table A4).

Guarantor loans – where a third party (usually a family member) under-

takes to repay the loan should the borrower fail to do so – are less common, but still relevant. 44% of Austrian households with outstanding loans (representing 50% of the total outstanding loan volume) have such a loan. The younger a household, the more likely it is to hold such a loan. 70% of

guarantors for such loans are the borrowers' partners, 22% are parents, 6% are other relatives and 2% are other people. Married couple homeowners and nonemployed persons make up an above-average share of guarantor loan borrowers, as do low-income groups. A breakdown by provinces shows that Vorarlberg ranks first in this category: A huge share – 83% – of indebted homeowners has at least one such loan.²⁶

3.5 Maturity

Since the start of Stage Three of EMU, the average maturity of new loans has climbed steadily in the euro area. This development reflects a rise in real estate prices and the associated increase in debt, but also longer life expectancy and a higher retirement age. Other contributing factors are stronger competition and better long-term financing conditions by banks. The longer average maturity of new loans is important in that it can balance the effects of rising debt levels: While the latter raise households' vulnerability to monetary shocks (and thus amplify the effects of such shocks), longer maturities can reduce these risks and dampen these effects.

Against this background, we will examine the characteristics of households that have loans with especially long maturities. Comparability is, however, limited based on the survey data, as comparing maturities would make sense only if we had a sample of house-

holds that took out their loans at the same time. Our data cover households that took out a loan between 1941 and 2008, though, and the sample would be too small if we focused on one particular year (e.g. 2007). Alternatively, we will compare data on residual maturity, which for this purpose is defined as the difference between the year in which the loan will mature and the year in which the interview took place (2008).²⁷

The average total maturity period of all loans outstanding as of 2007 was between 22 and 25 years (for the average household's loan with the shortest and longest maturity, respectively), depending on how many outstanding loans the household had.²⁸ The average residual maturity period of loans per household was 14 to 16 years (table A4). As expected, residual maturity declines the older borrowers are: While the minimum residual maturity for borrowers aged 18 to 29 is on average 19 years, the maximum residual maturity for those aged 60 to 69 years is 11 years. Maximum residual maturities tend to be shorter for high-income households than for low-income borrowers, who probably simply take longer to repay their loans. A similar picture emerges for debt amounts: The higher a loan is, the longer the residual maturity period. The longest average residual maturity periods are observed for borrowers from Vorarlberg (17 years) and Vienna (maximum²⁹ 19 years), while the shortest periods are recorded for Carinthia (maximum 11 years).

²⁶ This result is not very robust, though, as it is based on only 30 respondents from Vorarlberg.

²⁷ 49 households with negative residual maturity were not taken into account. Negative residual maturities can occur when respondents did not consider later extensions of maturity in their replies regarding the overall term of the loan and when the date of maturity as originally agreed had already passed at the time of the interview.

²⁸ According to the OeNB's housing finance survey, which was conducted among Austrian banks in summer 2008, the maximum maturity of new mortgage loans was 25 to 30 years in 2007.

²⁹ Maximum values are indicated because one household can have more than one loan.

3.6 Type of Interest Rate

The type of interest rate agreed for a loan is relevant for how quickly monetary shocks affect disposable income. Financial accounts data show that the bulk of loans in Austria are variable rate loans: 61% of housing loans extended in 2007 were variable rate loans, compared with 43% in the euro area.³⁰ Accordingly, the monetary transmission of interest rate changes to disposable income can be expected to be faster in Austria than on average in the euro area. The factors leading to the predominance of variable rate loans in Austria are not clear and may be highly varied. On the demand side, it may be cultural characteristics and rather low risk aversion. On the supply side, it could be banks' short-term refinancing practices or the historically strong bank competition, which has led banks to attract customers with low short-term interest rates. Institutional factors such as interest rate ceilings and floors have also played a role. See ECB (2009) for a more comprehensive discussion of these issues.

In this study, the variable rate loan category includes loans assigned to this category by the borrowing household as well as loans with a combination of fixed and floating rates. The survey data (table A4) indicate that 66% of households holding loans have at least one variable rate loan, 36% have at least one fixed rate loan and only 6% have at least one interest-free loan. These results are broadly confirmed by the aggregated data. Looking at households' characteristics, we find that the

share of variable rate borrowers is especially high among young homeowners (75% of those aged 18 to 29 years) and university graduates (79%). In a breakdown by provinces, it turns out that households from Vienna (82%), Burgenland (77%) and Vorarlberg (74%) rank first in this category. Fixed rate housing loans, by contrast, are more common among older households (42% of those aged 60 to 69 years) and civil servants (52%).³¹ Among the Austrian provinces, Lower Austria has the highest share of such loans (48%). Borrowers with outstanding interest-free loans³² tend to be in older age cohorts (32% of those aged 70+). Regarding income and regions, low-income groups (16%) and households from Tyrol (15%) are more likely to hold such loans than the other groups.

In a next step, we use a logit model to estimate the determinants of likelihood of variable rate debt, controlling for various sociodemographic variables (table A3). An interaction term of education and income shows that the likelihood of holding variable rate debt increases with income across all education levels – with the exception of the lowest education level: The term is significantly different from zero for all groups except graduates of secondary academic and secondary vocational schools. A decline in this likelihood with rising income is only observed for the group with the lowest education level. One possible interpretation of this outcome could be that households with low (compulsory) education levels tend to be more risk-averse and there-

³⁰ In this context, variable rate loans include loans with a floating rate and loans with an initial rate fixation of up to one year.

³¹ 82% of farmers hold fixed rate housing loans, but the survey sample was too small (less than 50 households) to yield robust results.

³² These results are not very robust, as the number of respondents holding interest-free loans was small in our sample (less than 50 households).

fore prefer to take out fixed rate or interest-free loans.³³ In addition, Lower Austria is the only province with a significantly lower prevalence of variable rate loans than Vorarlberg, which confirms the descriptive data according to which an above-average share of households from Lower Austria hold fixed rate loans. Age has no significant impact on the likelihood of holding variable rate debt.

Two other interesting outcomes are that 81% (i.e. a disproportionately large share) of households with bullet loans have at least one variable rate loan (table A5), and that the share of variable rate loans rises with average residual maturity, so that a trend emerges toward variable rate housing loans.

3.7 Repayment

The most common way for Austrian private borrowers to repay a loan is through regular installments of both interest and principal. These installments are higher in the beginning and decline gradually as more of the principal is repaid. 60% of Austrian households with outstanding housing loans in 2007 had at least one such installment loan for housing, which is by far the most common type of loan, accounting for 85% of the total volume of outstanding loans.

Another, less common way is bullet loans, where the entire initial loan amount is due at maturity (one-time payment) and borrowers make only monthly interest payments. A mere 12% of indebted households (accounting for 15% of the outstanding credit

volume) have at least one such loan (table A4). Bullet loans are especially popular among high-income groups (17%) and among households from Vorarlberg (38%) and Burgenland (32%).³⁴

Bullet loans are usually linked to repayment vehicles that borrowers use to save the amount of money required to redeem the loan at maturity. The higher the assumed average yield that is generated by the repayment vehicle, the lower the monthly saving amount that is required to pay back the loan. In case the interest yields fall behind expectations, however, borrowers may find it difficult to pay back the full loan amount. Our data indicate that most indebted households that hold repayment vehicles rely primarily on capital market investment to achieve their returns: 60% have a life insurance policy, 38% hold a mutual fund policy, and 4% hold stocks. Building and loan contracts (9%) and savings books (4%) play only a minor role as repayment vehicles.³⁵ This is why repayment vehicles involve the same risk as other types of security speculation: the higher the expected return, the greater the associated risk.

The average amount repaid in 2007 was EUR 7,883. Repayment amounts were especially high among university graduates (EUR 11,207), self-employed persons/business owners and civil servants (EUR 10,787 and EUR 10,077, respectively) as well as among households from Tyrol, Upper Austria and Vorarlberg (EUR 14,334, EUR 10,299 and EUR 9,969, respectively). The breakdown by households' loan portfolios in table A5 shows that repayment

³³ We developed risk aversion indicators based on the households' financial investment portfolios and included them as regressors. The impact of these variables on the likelihood of variable rate debt was, however, always insignificantly different from zero.

³⁴ The results for households that have bullet loans are not very robust, though, as the sample included only few such households.

³⁵ All figures in this sentence refer to households that hold at least one such instrument.

obligations are particularly high for households that have a foreign currency loan (EUR 9,594 per year), even though this group also has an above-average share of bullet loans. The longer the average residual maturity of a loan was (based on 2007 data), the higher the annual repayment amounts.

3.8 Loan-to-Value Ratio³⁶

The trend toward longer loan terms and new types of credit that allow for delaying repayment has led to a rise in the ratio of housing loans to housing wealth in the euro area. In 2007, this loan-to-value (LTV) ratio was on average 51% for Austrian households.³⁷ While households with a high LTV ratio can use a relatively larger share of their income for consumption, high LTV ratios also exacerbate potential wealth effects on consumption (e.g. through changes in real estate or security prices), which would eventually amplify the influence interest rate changes have on aggregate demand.

Table A4 shows that LTV ratios are higher the younger a household with outstanding debt is (74% in the youngest age group). It is the other way round with income: The higher household income, the lower the LTV ratio. While the LTV ratio is 68% for indebted households in the lowest income group, it is just 42% for those in the highest. The highest LTV ratios are reported for Vorarlberg (85%) and Vienna (60%), the lowest for Carinthia (37%), Burgenland (40%) and Lower Austria (42%).

The breakdown by loan types in table A5 shows that especially households with foreign currency loans or bank loans tend to have above-average LTV ratios (68% and 61%, respectively). The lower the average interest rate households pay for their loans, the higher their LTV ratio (64% in the lowest interest quartile).

4 Alternative Forms of Housing Finance³⁸

Taking out a loan is not the only way to finance real estate – people can make an inheritance or receive financial support from family or friends. These alternative forms of housing finance are important insofar as they are loan substitutes: If the amounts thus obtained make up a substantial share of housing finance, households will take out smaller loan amounts (if at all), household debt will be lower (as people do not have to pay back any money), and the households' sensitivity to changes in interest rates and income levels will decline. In this section, we focus exclusively on primary homeowners, as no data on alternative forms of housing finance are available for the other households.

Two-thirds of all homeowners in our data set had to rely on third-party financing³⁹ to purchase their primary residence. Around one-half of them financed their homes through credits alone, while the other half (at least also) used alternative forms of finance (40% received financial sup-

³⁶ In this section, we refer to all indebted households (including those who have taken out a housing loan to finance a housing association deposit or to purchase a second property).

³⁷ This share covers the entire stock of outstanding housing loans, not only new loans. According to the OeNB's housing finance survey, LTV ratios were between 70% and 96% for bank loans taken out in Austria in 2007.

³⁸ Our analysis of the variables presented in sections 4 and 5 (loan taken out, inheritance, inter vivos gift from family or friends and government-subsidized housing loan) is based on values at the time of the real estate purchase and not on values as of December 31, 2007, like in the previous sections. The data on sociodemographic characteristics, however, refer to the time of the interview. Our results should be interpreted in this light.

³⁹ This includes loans, inheritances or money received as an inter vivos gift from family or friends.

Table 2

Share of Different Financing Forms in the Primary Residence Purchase Price¹

	Mean	Median
	% of the purchase price	
Repayment required:		
Loan financing	96	61
of which:		
Government-subsidized housing loans	72	29
Loans granted by households ²	55	39
No repayment required:		
Inheritance	83	43
Inter vivos gifts from family or friends (money)	46	16

Source: OeNB 2008 HSHW.

¹ Only households that have purchased their primary residence.

² Number of households <50.

port from family or friends, 15% made an inheritance). The characteristics of households that rely at least partly on alternative forms of housing finance are very similar to those that use loans only (see table A6 for details).⁴⁰ The few differences refer e.g. to age (households that use alternative forms of housing finance tend to be younger) and use (they tend to use their primary residence for professional purposes). No clear pattern is observed for income. A breakdown by provinces shows that an above-average share of these households live in Carinthia and Upper Austria. In addition, households with high-value homes (measured by the estimated sales price) make up an especially large share of this group.

Table 2 shows the contribution of each form of financing to the purchase price of the primary real estate. Among home loan borrowers, loan financing accounted for the bulk of the purchase price paid for the primary residence (median: 61%). Among those who used an inheritance to finance their homes, this form of financing covered almost one-half of the purchase price (median: 43%). The households that received

financial support from family or friends reported that this money covered only a small portion of the purchase price (median: 16%).

The remaining third of Austrian homeownership households did not require third-party financing. As expected, these are primarily households that received the property as an inheritance or inter vivos gift. This group is characterized by a low educational level of the household head or a low household income, which indicates low creditworthiness. A breakdown by regions shows that no third-party financing is required above all by households living in small municipalities or rural areas and those living in Styria and Lower Austria.

5 Taxes and Subsidies in the Real Estate Sector

Regulation helps smooth price fluctuations in the real estate market. Several economic policy tools and measures can be used to promote residential construction investment and affordable homeownership. The range of regulatory measures at the international level includes income-tax deductibility of interest payments or mortgage loan subsi-

⁴⁰ The values for the second group represent the complementary set of the first group's values (table A6, columns 3 and 4 as well as 7 and 8).

dies for households. Direct housing subsidies can be capital grants or lump sum exemptions from interest payments. Other measures taken by governments to promote nonprofit residential construction include financing or subsidizing housing construction. The question whether national differences in tax relief and housing assistance schemes are responsible for the substantial differences in homeownership ratios across Europe is frequently addressed in the literature. In 2007, homeownership ratios were highest at above 75% in Cyprus, Spain, Greece, Ireland or Sweden, in the mid-range between 55% and 60% in Austria, France, Finland and the Netherlands, and at the lower end of the spectrum at 43% in Germany (ECB, 2009). The question whether mortgage interest tax relief stimulates owner-occupied housing is often discussed in the literature. In an analysis of the relevant features of the Dutch tax system, Swank et al. (2002) find that both starters and movers benefit from tax relief for higher income groups. Tax breaks for homeowners, however, tend to favor the emergence of real estate bubbles (especially if interest rates are low and LTV ratios are high). The authors come to the conclusion that the efficiency of implicit tax subsidies for homeowners depends critically on the price elasticity of demand for newly built dwellings. Flevotomou and Matsaganis (2007) show for the Netherlands, Sweden, Finland, Italy and Greece that the distributional effects of tax deductibility of interest payments are regressive: Higher-income groups account for a disproportionately large share of those who benefit from mortgage interest tax relief in all countries under review.

In the OeNB's HSHW, 25% of all respondents (homeowners and tenants)

stated that the actual housing costs were higher than they had expected when moving in.

The survey results indicate that in 2007, 12% of tenants received rent subsidies from the provincial government. As expected, these were above all households with low income and education levels – the share of recipients is highest in the income group up to EUR 1,432 and among those who completed only compulsory schooling or an apprenticeship. According to the survey respondents, rent subsidies were between EUR 120 and EUR 4,200 for the whole year (with 28% of recipients receiving less than EUR 1,000).

The Austrian housing assistance schemes (*Wohnbauförderung*) are another economic policy tool for providing direct subsidies. While the concrete arrangements and subsidy amounts differ across the Austrian provinces, housing assistance funds (like, of course, the capital available for down payments) generally play an important role in a bank's assessment of housing loan applications. As many as 42% of primary homeowners received funds from a housing assistance scheme when they purchased or built their home. These funds account for a considerable

Chart 3

Housing Assistance Recipients by Income Groups



Source: OeNB 2008 HSHW.

share of the primary residence purchase price (mean: 72%, median: 29%; see table 2). Interestingly, the share of housing assistance recipients increases with rising income (chart 3). 64% of the assistance provided was loans, 33% was (repayable or nonrepayable) interest or repayment subsidies.

Public housing is another key area of housing subsidies in Austria. 12% of respondents live in a public housing apartment⁴¹ (*Gemeindewohnung*). The households' income background seems to play only a minor role in this context: As many as 18% of public housing tenants were from the highest income group.

Nonprofit housing construction (*gemeinnütziger Wohnungsbau*) is another

means of providing direct housing construction subsidies. In 2006, nonprofit housing associations managed some 22% of all apartments in Austria. This share has increased steadily over the past decades – 30 years ago, it was only around 10%. 17%⁴² of the surveyed households stated that they were housing association tenants.⁴³ Households with mid-level incomes make up the majority of housing association tenants – 27% of them have a monthly net income between EUR 796 and EUR 1,432, and another 31% receive between EUR 1,433 and EUR 2,388 (table 3).

The share of housing association tenants is smaller in the other income

Table 3

Tenants of Subsidized Apartments by Income Category

	Monthly net income				
	Up to EUR 795	EUR 796 to EUR 1,432	EUR 1,433 to EUR 2,388	EUR 2,389 to EUR 3,185	EUR 3,186 EUR and above
	% of households				
Public housing apartment	8	35	25	14	18
Housing association apartment	9	27	31	16	17
Loan to finance the deposit required for the housing association apartment	3	15	37	20	25
	Size of the deposit made when moving in				
Up to EUR 1,000	13	33	34	12	8
EUR 1,001 to EUR 2,000	8	44	32	6	10
EUR 2,001 to EUR 10,000	8	27	27	23	15
EUR 10,001 to EUR 20,000	4	18	39	18	21
EUR 20,001 to EUR 40,000	17	21	23	15	24
EUR 40,001 to EUR 60,000	6	28	38	15	13

Source: OeNB 2008 HSHW.

⁴¹ Public housing apartments are owned by the respective municipality, which is the developer and landlord of these traditionally very affordable apartments. For a small share of these apartments (mainly new dwellings), the municipality can demand that tenants make a down payment for construction costs in addition to paying rent.

⁴² 17% of the surveyed households are housing association tenants – the 22% mentioned above refer to housing association apartments.

⁴³ Eligibility criteria for housing association tenants differ across the Austrian provinces. In general, tenants must be citizens of Austria or an EU Member State, and household income must not exceed a specified limit. The apartment must not be used as a second home or sublet to a third party. Another potential barrier for housing association tenants is the deposit they need to pay upon conclusion of the rental agreement. The amount of the deposit depends on when the apartment was built, where it is located and what size it is. Upon termination of the rental agreement, tenants receive back the deposit they paid made minus 1% per year.

categories. 62% of these tenants completed an apprenticeship or graduated from vocational school. The share of housing association tenants is highest in the youngest age group, and it drops significantly among households aged 50+.

25% of housing association tenants took out at least one loan to finance the deposit they had to make to the housing association. It is noteworthy, though, that while 9% of housing association tenants are in the lowest income group, only 3% of those tenants who took out a loan to finance the deposit are in the lowest income group. This goes to show, once again, that higher income earners find it easier to obtain a loan. 11% of housing association tenants did not have to make a deposit at all when moving in, and for another 40% the amount was below EUR 5,000. Higher income households tended to pay higher amounts than lower income groups.

Thus, we find differences in the extent to which each income group benefits from the various housing subsidy schemes: While direct housing subsidies seem to benefit higher income earners more than lower income groups (chart 3), the latter receive support in the form of rent subsidies and government-subsidized housing (table 3).

6 Summary and Conclusions

This study presents a first overview of the results of the OeNB's HSHW in Austria.

22% of Austrian households had outstanding housing loans in 2007. Loan-to-value ratios, loan amounts and loan types are highly heterogeneous across household characteristics: Socio-demographic factors (e.g. age), socio-economic factors (e.g. income) and geographical factors (e.g. province) seem to play an important role.

Homeowners in the age group 18 to 39 years are significantly more likely to

hold housing loans, and their debt levels tend to be higher than in the other age groups. Purchasing the primary residence (homeowners) or financing the housing association deposit (tenants) are the main reasons for this age group to take out a housing loan. Higher-risk financing, e.g. foreign currency loans, mortgage equity withdrawals, variable rate loans or high LTV ratios, is more common in this group than in the others. At the same time, these borrowers hold an above-average share of guarantor loans, the loans' residual maturities tend to be longer, and many of these borrowers also rely on alternative forms of financing (money they do not have to pay back, e.g. inheritance, financial support from family or friends). By contrast, older homeowners tend to take out loans to purchase a second property, which most of them use for themselves (e.g. vacation home, usable space). Austrians rather rarely purchase homes to rent them out or as an investment. Households in these age groups tend to avoid taking out bank loans, relying on loans granted by the province or public institutions or loans granted by employers or households instead. An above-average share of primary home buyers in this age group do not need third-party funds (be it loans, an inheritance or support by family or friends).

A breakdown by income groups reveals that a disproportionately large share of low-income households did not take out a housing loan at all, which points to a limited propensity or possibility to borrow. It seems that low-income households with outstanding housing debt are especially vulnerable, given that their LTV ratios and their debt-servicing ratios in relation to income are disproportionately high. The median share in disposable income used to pay back primary residence loans is

50% in the lowest income quartile, but only 12% in the highest one. As the lowest-income households account for only 10% of all outstanding housing loans, the associated risks to financial stability are limited, though. When low-income households incur debt, they tend to additionally use alternative forms of financing they do not have to pay back (inheritance, financial support by family or friends) or take out an interest-free loan or a loan granted by their employer (e.g. advances on salary) or by other households (e.g. family or friends). High-income households, by contrast, are significantly more likely to hold debt, and the amounts taken out are higher. An above-average share of them use the money to purchase a second property. Higher-risk financing, e.g. foreign currency loans, bullet loans linked to repayment vehicles or mortgage equity withdrawals, is also more common in this income group than in others. Such higher-risk financing and the fact that high-income households tend to take out variable rate loans expose them more to interest rate risk than other households. However, as LTV and debt-servicing ratios decline with rising income, the risk potential of households in the highest income quartile seems manageable from a financial stability perspective.

There are substantial regional differences in the type and amount of debt incurred. Certain loan characteristics, e.g. debt amounts, seem to follow a west-east pattern (with the exception of Salzburg): While average household debt for housing comes to as much as EUR 161,455 in the west of the country (Vorarlberg), this amount is EUR 98,568 in Upper Austria and only EUR 53,084 in the east (Lower Austria). A similar picture emerges for guarantor loans: They are disproportionately common in the west (Vorarlberg) but rather rare

in the east (Vienna). Another west-east pattern can be observed for LTV ratios (except for Vienna): This ratio is 85% for the median household in Vorarlberg, but only 40% in Burgenland and 42% in Lower Austria. We identified a number of other prominent loan characteristics for the individual provinces. A case in point is foreign currency loans: A disproportionately large share of households from Vorarlberg have taken out foreign currency loans, which likely reflects the geographical proximity to Switzerland and the Swiss franc. Another case in point is the purpose of the loan: We found that very many Viennese households are second home borrowers, many households from Carinthia (and Vienna) have taken out a loan to finance deposits to the housing associations, and very many households from Vorarlberg are primary residence borrowers. Loans granted by the government are especially common in Burgenland and Lower Austria; fixed rate loans are also very customary in Lower Austria.

This survey for the first time provides us with Austrian data on loans granted to households by employers (e.g. advances on salary) and other households (e.g. family or friends). It turns out that Austrian households hardly ever use these types of loans: They account for no more than 4% of the total volume of outstanding household loans for housing, while bank loans make up 79% and loans granted by the government account for 17%.

Alternative forms of financing that do not have to be paid back (e.g. inheritance, inter vivos gifts by family or friends) must be considered in our analysis, as they play a significant role in the field of housing finance. Households that receive such funds can take out smaller loans, if any. For the median borrower, loans accounted for 61% of

the purchase price. For the median heir, the inheritance made up 43%, and for the median recipient of inter vivos gifts from family or friends, this type of financing accounted for 16% of the purchase price.

The survey results also show that Austria has a strong rental market that is mainly based on subsidized housing: 50% of all Austrian households rent their primary homes, and 60% of these properties are housing association or public housing apartments. The fact that the rental market is strongly subsidized seems to have contributed to the rather low homeowner ratio by European standards: Homeowning households mainly use their property for residential purposes and not so much as an investment. Among second home borrowers, 52% use the property for residential or similar purposes, while only 26% rent them out and the remaining households (roughly one-quarter) use them as an investment.

In addition, the Austrian housing assistance schemes – which are less vulnerable to cyclical developments than tax-based systems are – seem to be one of the reasons for the moderate

development of real estate and rent prices. These schemes have led to varying effects of each housing subsidy instrument on the different income groups: While direct housing subsidies seem to benefit higher income earners more than lower income groups, the latter receive support in the form of rent subsidies and government-subsidized housing.

The differences in the structure of Austrian households' housing finance suggest that the impact of monetary policy on wealth (and hence on household consumption and savings) will also differ markedly. Changes in the regulation of the housing finance market have an impact not only on households' behavior, but also on financial stability and the effectiveness of the monetary transmission mechanism, and thus also on the development of other macroeconomic variables. Last, but not least, the survey data show that there is still some leeway for economic policymakers to optimize the specific design of the housing assistance framework and the range of available housing finance instruments.

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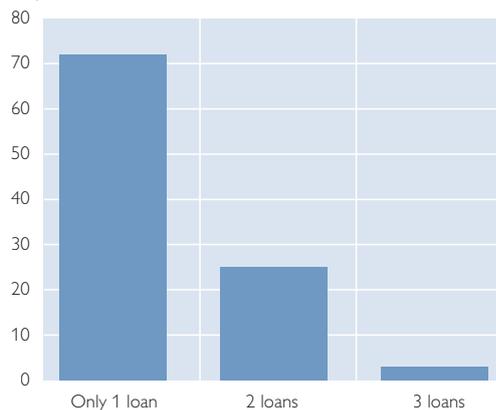
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Annex

Chart A1

Number of Outstanding Housing Loans

% of indebted Austrian households



Source: OeNB 2008 HSHW.

Note: Only primary residence debt.

Housing Debt Rates and Housing Debt Amounts by Households' Characteristics

	Number of households surveyed	Share of indebted households ¹	Debt amounts (if the household is indebted)			Number of households surveyed	Share of indebted households ¹	Debt amounts (if the household is indebted)	
			Mean	Median				Mean	Median
			EUR					EUR	
	%				%				
All households	2,081	22	77,514	42,944					
Gender									
Male	981	24	75,456	40,000	Holds bonds				
Female	1,100	21	79,609	50,000	No	1,942	21	74,239	40,000
					Yes	139	36	104,880	80,000
Age					Holds stocks				
18 to 29 years	285	15	72,426	40,000	No	1,847	21	79,110	42,327
30 to 39 years	382	33	86,314	65,434	Yes	234	32	69,068	44,240
40 to 49 years	491	32	82,828	36,000	Holds mutual fund shares				
50 to 59 years	384	21	69,023	40,000	No	1,991	22	75,661	41,475
60 to 69 years	310	14	63,196	29,403	Yes	90	34	103,411	84,191
70 years and older	229	6	42,292	24,330	Holds equity investment				
					No	2,052	22	77,427	42,176
Highest educational level completed					Yes	29	44	80,905	86,040
Compulsory education (maximum)	356	10	71,501	32,000	Does not hold any investment instruments				
Apprenticeship, vocational school, intermediate or higher technical/vocational school	1,191	23	74,859	41,458	No	1,917	23	77,570	42,944
Academic secondary school, higher-level technical/vocational school	319	24	69,029	41,967	Yes	164	13	76,444	40,532
College, university, academy	215	38	96,539	56,089	Owns the primary residence				
					Yes, purchased	614	48	92,275	66,850
Marital status					Yes, inherited	281	14	70,883	31,554
Single	489	15	60,397	39,280	Yes, inter vivos gift	125	26	84,094	30,000
Married	1,141	31	85,715	50,000	Yes, combination of several factors	31	34	139,875	129,262
Divorced	276	17	64,410	35,000	Yes, other	34	15	154,072	50,000
Widowed	175	6	26,534	24,330	No, tenant who paid a deposit	293	20	16,067	7,965
					No, tenant who did not pay a deposit	703	5	43,986	23,010
Occupational status / work generating the household's main income					Purchased at least one property				
Liberal professions, business owners	109	30	130,194	88,446	Yes, at least partly	768	46	86,439	55,363
Employees	614	28	70,901	39,901	No, other form of financing	501	16	76,416	30,000
Civil servants	117	39	79,052	41,508	No, tenant who paid a deposit	247	18	13,914	7,262
Farmers	56	11	66,856	47,271	No, tenant who did not pay a deposit	565	0	0	0
Workers	329	27	82,640	51,177	Inherited at least one property				
Other	81	23	79,606	55,000	Yes, at least partly	446	17	91,132	55,000
Pensioners	553	11	61,160	30,000	No, other form of financing	823	43	83,114	50,000
Nonemployed	222	15	76,951	42,082	No, tenant who paid a deposit	247	18	13,914	7,262
					No, tenant who did not pay a deposit	565	0	0	0
Total monthly net income					Housing wealth quartile				
Up to EUR 795	173	10	72,807	56,185	Up to EUR 109,571	79	25	45,079	26,930
EUR 796 to EUR 1,432	472	9	67,713	27,109	EUR 109,572 to EUR 200,000	128	36	80,058	50,000
EUR 1,433 to EUR 2,388	598	24	74,717	40,000	EUR 200,001 to EUR 310,691	118	40	83,570	60,000
EUR 2,389 to EUR 3,185	373	31	69,064	40,241	EUR 310,692 and above	113	35	119,478	77,659
EUR 3,186 and above	464	34	90,170	55,000					
Interviewer's impression of the apartment or house									
Very exquisite and luxurious	53	43	100,388	50,000					
Rather high standard of living	494	36	87,000	61,105					
Good, medium standard of living	1,053	22	69,244	32,613					
Rather basic standard of living	416	7	74,409	50,000					
Poor standard of living	65	3	48,802	53,939					
Province									
Vorarlberg	79	32	161,455	118,924					
Tyrol	164	22	116,131	101,037					
Salzburg	134	25	50,848	41,458					
Upper Austria	326	24	98,568	55,000					
Carinthia	140	11	69,103	31,360					
Styria	295	17	71,559	50,000					
Burgenland	72	31	61,476	40,000					
Lower Austria	420	27	53,084	26,615					
Vienna	451	20	64,775	27,986					

Source: OeNB 2008 HSHW.

¹ Refers to the share of indebted households in each category.

Table A2

Housing Debt Amounts by Households' Loan Characteristics¹

	Number of households surveyed	Debt incurred to purchase the primary residence			Number of households surveyed	Debt incurred to purchase the primary residence	
		Mean	Median			Mean	Median
		EUR				EUR	
All households	360	91,279	61,434				
Sales price quartiles (based on the estimated sales price of the primary residence)				At least one loan granted by the government			
Up to EUR 120,000	75	58,950	44,609	No	224	103,678	80,000
EUR 120,001 to EUR 200,000	107	85,099	59,945	Yes	136	70,932	40,960
EUR 200,001 to EUR 300,000	101	97,868	90,000	At least one loan granted by the employer or by another household			
EUR 300,001 and above	76	123,985	79,818	No	347	89,987	60,044
				Yes	13	122,447	105,151
Debt amount quartiles (only debt incurred for purchasing the primary residence)				At least mortgage equity withdrawal			
Up to EUR 25,492	94	13,451	12,000	No	229	85,650	56,485
EUR 25,493 to EUR 61,434	88	42,010	40,000	Yes	131	101,347	75,000
EUR 61,435 to EUR 127,779	89	92,077	92,296	At least one guarantor loan			
EUR 127,780 and above	89	217,842	189,927	No	199	82,207	57,618
At least one foreign currency loan				Yes	161	102,955	71,028
No	258	76,879	50,000	At least one variable rate loan			
Yes	102	127,351	97,925	No	128	70,720	35,000
At least one loan from a building and loan association				Yes	232	101,909	80,000
No	153	77,149	38,028	At least one bullet loan			
Yes	207	101,825	78,216	No	317	79,123	50,432
At least one government-subsidized housing loan				Yes	43	180,692	170,000
No	188	103,834	74,125	Average LTV ratio in quartiles			
Yes	172	77,362	50,000	Up to 12%	94	20,289	14,667
At least one bank loan				13% to 31%	90	55,360	41,475
No	87	55,476	28,140	32% to 60%	90	114,492	99,508
Yes	273	102,250	78,402	60% and above	86	175,300	151,765

Source: OeNB 2008 HSHW.

¹ This table refers only to households that took on debt to purchase their primary residence.

Determinants of Housing Debt

Binomial logit estimation or OLS estimation of the determinants of ...

Variables	Housing debt rate (Logit)	Logarithmized housing debt amounts (OLS)	Foreign currency housing loan (Logit)	Variable rate housing loan (Logit)
Household net income	2e-04*** (-7.29e-05)	-7.83e-06 (3.13e-05)	1.43e-04** (0.032)	-0.001* (0.000)
Household net income²	-1.13e-08** (4.33e-09)			
Age	0.0708** (0.0323)	-0.0314 (0.0360)	-0.014 (0.078)	0.071 (0.072)
Age²	-1.06e-03*** (3.6e-04)	1.95e-04 (3.79e-04)	-4.91e-04 (0.001)	-0.001 (0.001)
Highest educational level completed (categories) Reference: compulsory schooling (maximum)				
Apprenticeship, vocational school, intermediate or higher technical/vocational school	0.568** (0.221)	-0.0997 (0.233)	1.871** (0.757)	-1.707 (0.967)
Academic secondary school, higher-level technical/vocational school	0.878*** (0.267)	0.0898 (0.267)	1.477* (0.840)	-1.660 (1.195)
College, university, academy	1.428*** (0.281)	0.267 (0.269)	1.701** (0.835)	-1.213 (1.271)
Interaction term education*income Reference: compulsory schooling (maximum)*income				
Apprenticeship, vocational school, intermediate or higher technical/vocational school*income				0.001* (0.000)
Academic secondary school, higher-level technical/vocational school* income				0.001 (0.000)
College, university, academy*income				0.001* (0.000)
Have you ever inherited a property? Reference: Yes				
No	0.363** (0.167)			
Number of household members	0.0797 (0.0605)		0.021 (0.129)	
Number of children		0.0992 (0.0701)		
Number of adults		0.0178 (0.0915)		
Year the household moved in/year the loan was taken out				-0.068*** (0.019)
Year the household last moved into a property/year the household last took out a housing loan		-0.0242*** (0.00808)		
Gender Reference: Male				
Female	-0.0716 (0.128)	0.0662 (0.141)	0.208 (0.317)	-0.262 (0.292)
Occupational status Reference: Liberal profession, business owner				
Employees	0.294 (0.259)	-0.311 (0.246)	-1.228** (0.543)	0.224 (0.638)
Civil servants	0.524 (0.318)	-0.387 (0.292)	-1.651** (0.728)	-0.644 (0.775)
Farmers	-0.589 (0.603)	0.794 (0.768)		-0.621 (1.113)
Workers	0.298 (0.285)	-0.333 (0.273)	-0.651 (0.564)	-0.0108 (0.655)
Other	0.102 (0.367)	-0.538 (0.386)	-1.049 (0.950)	-0.208 (0.840)
Pensioners	0.360 (0.330)	-0.263 (0.381)	0.045 (0.768)	0.643 (0.813)
Nonemployed	-0.227 (0.346)	-0.624* (0.353)	-1.456** (0.743)	0.396 (0.780)
Occupational status of the respondents' partners Reference: No paid work				
No partner		-0.0185 (0.330)		
Partner is engaged in paid work		0.0111 (0.216)		
Marital status Reference: Single				
Married	0.860*** (0.200)	0.131 (0.248)	0.881 (0.571)	-0.121 (0.436)
Divorced	0.259 (0.250)	0.193 (0.250)	1.207* (0.704)	-1.063* (0.552)
Widowed	0.114 (0.426)	0.163 (0.527)	2.937*** (0.989)	0.265 (0.880)

Source: OeNB 2008 HSHW.

Note: *** p<0.01, ** p<0.05, * p<0.1. Standard errors are indicated in brackets.

Sample size for debt rate: all 2,081 households surveyed; for debt amounts all 483 indebted households; for foreign currency and variable rate loans all 360 households that took on debt to purchase their primary residence.

The sample size also varies depending on the imputation data set. The numbers of observations indicated in the table refer to the lowest figure of the five data sets used in the multiple imputations.

(continued) Table A3

Binomial logit estimation or OLS estimation of the determinants of ...

Variables	Housing debt rate (Logit)	Logarithmized housing debt amounts (OLS)	Foreign currency housing loan (Logit)	Variable rate housing loan (Logit)
Currently attending school or university				
<i>Reference: Yes</i>				
No	1.040** (0.446)	-0.2 (0.468)	-0.542 (0.909)	
Province				
<i>Reference: Vorarlberg</i>				
Tyrol	-0.518 (0.341)	-0.407 (0.355)	-3.342*** (0.827)	-0.637 (0.676)
Salzburg	-0.166 (0.351)	-1.067*** (0.354)	-2.142*** (0.749)	-0.280 (0.738)
Upper Austria	-0.442 (0.302)	-0.702** (0.280)	-0.479 (0.544)	-0.423 (0.609)
Carinthia	-1.291*** (0.427)	-1.197** (0.439)	-1.300 (0.850)	-0.408 (0.881)
Styria	-0.674** (0.327)	-0.857** (0.320)	-0.784 (0.589)	-0.533 (0.673)
Burgenland	-0.0719 (0.392)	-0.949** (0.374)	-0.814 (0.722)	-0.211 (0.819)
Lower Austria	-0.118 (0.298)	-1.179*** (0.286)	-2.269*** (0.635)	-1.311** (0.629)
Vienna	-0.395 (0.333)	-0.949** (0.397)	-1.613** (0.661)	-0.120 (0.807)
Interviewer's assessment of the type of building				
<i>Reference: Residential farm building</i>				
Detached (single-family) house	0.438 (0.324)	0.763* (0.408)	0.984 (1.536)	
Row house or duplex	0.696** (0.346)	0.725 (0.434)	1.424 (1.521)	
Apartment block <9 apartments	-0.0121 (0.356)	0.274 (0.430)	0.904 (1.592)	
Apartment block with 10 to 19 apartments	-0.00997 (0.369)	0.246 (0.465)	1.398 (1.624)	
Apartment block >20 apartments	-0.242 (0.395)	0.287 (0.486)	1.936 (1.656)	
Residential building for community living	0.975 (0.656)	0.7 (0.788)	x	
Have you ever owned an apartment/house before becoming the owner of this place?				
<i>Reference: No</i>				
Yes	0.377** (0.159)		-0.102 (0.374)	
Acquired through an inheritance				
<i>Reference: acquired in another way</i>				
At least part of the property was acquired through an inheritance		-0.0684 (0.163)		
Tenant who paid a deposit for a housing association apartment		-1.503*** (0.293)		
Has to limit spending to afford housing costs				
<i>Reference: Yes</i>				
No				-0.570* (0.302)
Size of the municipality				
<i>Reference: Up to 2,000 inhabitants</i>				
Up to 5,000 inhabitants				-0.300 (0.400)
Up to 20,000 inhabitants				-0.392 (-0.418)
Up to 50,000 inhabitants				-0.651 (0.641)
More than 50,000 inhabitants				-0.701 (0.657)
Constant	-5.131*** (0.856)	12.56*** (1.217)	-0.866 (2.707)	2.368 (-2.031)
Number of observations	2,081	479	352	360

Housing Loan Features by Households' Characteristics¹

	Type of loan		Lender			Purpose			
	Foreign currency loan	Loan granted by building and loan association	Bank loan	Government loan	Loan granted by employer/household	Loan to finance deposit	Loan to purchase primary residence	Loan to purchase second property	Mortgage equity withdrawal (at least once)
Share									
%									
All households	29	57	77	38	4	12	74	17	24
Gender									
Male	25	59	77	43	3	10	72	20	25
Female	32	55	77	33	5	13	76	14	22
Age									
18 to 29 years	42	89	100	19	0	6	57	6	51
30 to 39 years	32	59	83	29	4	5	78	12	33
40 to 49 years	31	58	73	41	4	3	80	12	28
50 to 59 years	16	46	73	47	1	1	70	31	21
60 to 69 years	23	54	70	50	6	1	72	27	11
70 years and older	17	17	34	47	20	0	62	38	0
Highest educational level completed									
Compulsory schooling (maximum)	11	41	70	54	0	20	78	2	9
Apprenticeship, vocational school, intermediate or higher technical/vocational school	34	59	76	37	2	13	74	16	25
Academic secondary school, higher-level technical/vocational school	24	61	75	41	6	6	75	20	26
College, university, academy	23	55	81	29	9	10	72	21	26
Marital status									
Single	19	61	84	24	1	18	74	13	27
Married	31	57	76	42	4	10	75	18	25
Divorced	27	54	78	23	13	13	67	21	22
Widowed	42	52	48	86	0	21	79	0	10
Occupational status / work generating the household's main income									
Liberal professions, business owners	43	72	85	23	7	4	78	25	24
Employees	26	58	78	36	1	13	75	14	27
Civil servants	19	41	55	67	12	11	60	29	21
Farmers	0	35	89	37	14	0	100	0	28
Workers	40	67	87	34	2	18	74	10	32
Other	26	75	85	22	6	2	83	15	43
Pensioners	25	44	68	42	7	4	77	24	10
Nonemployed	22	48	67	46	5	18	71	14	31
Total monthly net income									
Up to EUR 795	13	48	81	36	9	9	80	18	30
EUR 796 to EUR 1,432	32	64	66	38	16	21	68	17	12
EUR 1,433 to EUR 2,388	26	52	81	32	3	15	74	12	21
EUR 2,389 to EUR 3,185	24	62	76	43	4	12	74	16	27
EUR 3,186 and above	35	58	75	40	1	5	75	23	28
Interviewer's impression of the apartment or house									
Very exquisite and luxurious	44	71	94	15	5	5	73	21	41
Rather high standard of living	29	54	76	37	3	6	82	15	24
Good, medium standard of living	28	59	74	43	4	17	68	18	24
Rather basic standard of living	16	51	82	28	4	6	81	17	13
Poor standard of living	57	100	100	0	57	0	100	0	36
Province									
Vorarlberg	64	76	100	15	0	0	100	0	27
Tyrol	7	57	86	32	8	2	88	12	28
Salzburg	19	51	67	49	0	12	81	6	39
Upper Austria	46	72	85	35	6	2	82	18	20
Carinthia	31	58	77	30	10	30	61	9	12
Styria	32	58	86	18	4	0	89	17	22
Burgenland	30	49	68	65	4	12	82	10	13
Lower Austria	13	41	53	62	1	13	82	8	31
Vienna	26	63	90	15	7	28	37	37	7
Holds bonds									
No	29	57	76	37	3	13	74	15	23
Yes	27	62	78	43	10	0	74	32	28
Holds mutual fund shares									
No	27	57	76	38	4	12	75	16	23
Yes	60	65	93	30	4	3	66	31	27
Holds equity investment									
No	28	57	76	38	4	12	74	16	23
Yes	49	69	81	19	10	0	66	34	36
Does not hold any investment instruments									
No	29	57	76	38	4	11	74	17	23
Yes	16	59	90	29	0	22	72	6	31

Source: OeNB 2008 HSHW.

¹ All households still indebted for the purchase of their primary residence, with the exception of the columns "Purpose" and "LTV ratio" (all households with any housing debt) as well as "Mortgage equity withdrawal" (all households indebted for the purchase of the primary residence at any point in the past, even if already repaid).

Note: Share refers to the share of households in the respective household category.

Collateralization		Maturity		Interest rate					Repayment		LTV ratio (in % of housing wealth)
Guarantor loan	Mortgage loan	Residual maturity of the loan with the shortest maturity	Residual maturity of the loan with the longest maturity	Fixed rate loan	Variable rate loan	Interest- free loan	Interest rate of the lowest- rate loan (if not interest- free)	Interest rate of the highest- rate loan (if not interest- free)	Bullet loan	Repay- ment amounts	
		Mean		Share			Mean		Share	Mean	
		years		%					%	EUR	%
44	90	14	16	36	66	6	2.8	3.3	12	7,883	51
37	91	13	15	41	66	5	2.8	3.4	12	7,631	43
50	90	15	16	31	66	7	2.7	3.2	12	8,124	60
58	97	19	20	36	75	0	2.8	3.5	5	7,972	74
17	87	16	18	30	72	5	2.7	3.2	15	7,908	69
49	91	13	15	37	61	7	2.7	3.2	14	8,439	49
37	91	10	12	44	67	2	2.8	3.3	10	6,617	36
19	93	9	11	42	60	13	2.9	4.0	2	8,242	28
0	90	15	15	24	44	32	4.3	4.3	17	6,446	14
45	95	12	13	39	62	3	2.6	3.4	11	6,736	57
49	90	14	15	34	64	8	2.8	3.2	14	7,611	52
42	91	14	17	52	61	2	2.7	3.4	8	5,926	46
27	88	14	16	26	79	7	2.7	3.4	10	11,207	50
36	85	14	16	31	72	5	2.8	3.4	4	6,214	46
50	92	14	15	36	68	7	2.8	3.3	14	8,624	47
17	82	14	15	48	46	6	2.7	3.1	12	5,871	91
19	100	18	18	30	57	13	3.6	4.4	0	6,674	17
38	90	15	18	30	73	4	1.9	2.3	15	10,787	56
48	89	15	16	39	66	4	2.8	3.2	14	6,814	58
40	90	12	14	52	56	9	2.5	3.4	5	10,077	45
40	100	14	15	82	43	14	2.2	3.4	0	4,996	23
48	93	13	14	34	67	5	2.8	3.3	14	7,916	54
43	88	14	16	29	72	6	3.5	4.1	18	8,040	72
26	88	11	13	31	63	13	3.4	4.1	12	8,303	29
55	95	14	17	22	72	9	2.0	3.0	0	7,943	42
55	89	13	17	37	60	16	1.8	2.9	0	5,348	68
46	96	14	18	37	54	14	2.9	3.2	8	10,013	74
40	84	14	15	35	67	6	3.0	3.5	13	7,877	56
38	93	14	15	32	71	6	3.0	3.6	8	7,065	45
49	93	14	15	40	65	4	2.5	2.9	17	8,247	42
39	86	16	17	40	69	5	2.7	2.8	19	11,038	43
50	89	14	16	35	64	9	2.6	3.2	13	8,583	42
43	94	13	15	37	66	5	2.9	3.4	11	7,257	59
21	79	15	16	27	79	4	3.3	3.9	9	5,845	50
0	100	8	13	100	57	0	3.1	3.2	0	9,721	51
83	91	17	17	30	74	1	2.3	2.8	38	9,969	85
38	86	14	16	26	71	15	2.7	3.1	8	14,334	51
41	96	15	15	30	68	6	3.4	3.8	6	7,668	47
56	95	12	15	42	70	4	3.2	4.0	16	10,299	50
69	100	10	11	42	65	10	3.4	3.4	10	5,225	37
42	79	15	16	26	70	4	2.9	3.0	8	5,777	44
34	86	12	15	37	77	1	2.5	3.6	32	5,358	40
34	93	13	14	48	47	10	2.5	3.0	6	4,371	42
21	87	16	19	24	82	3	2.3	3.0	3	9,072	60
46	90	14	16	37	65	6	2.8	3.3	12	7,353	50
28	95	12	15	25	71	10	3.0	3.5	16	12,314	55
43	91	14	16	37	65	6	2.8	3.3	10	7,865	48
55	82	16	16	27	76	10	2.6	2.7	42	8,157	86
44	90	14	16	37	65	6	2.8	3.3	12	7,845	49
27	88	19	20	8	92	10	3.7	3.7	27	9,526	105
44	90	14	16	36	66	6	2.8	3.3	12	7,918	51
47	88	12	14	30	59	9	2.3	3.0	11	7,180	46

Credit Portfolio of Indebted Households in Austria¹

	Type of loan		Lender			Purpose			
	Foreign currency loan	Loan granted by building and loan association	Bank loan	Government loan	Loan granted by employer/household	Loan to finance deposit	Loan to purchase primary residence	Loan to purchase second property	Mortgage equity withdrawal (at least once)
Share									
%									
All households	29	57	77	38	4	12	74	17	24
Sales price quartiles (primary residence)									
Up to EUR 120,000	25	60	75	34	4	0	92	11	18
EUR 120,001 to EUR 200,000	29	60	78	39	4	0	96	7	23
EUR 200,001 to EUR 300,000	31	59	76	40	1	0	96	5	27
EUR 300,001 and above	28	47	77	37	7	0	93	12	25
Debt amount quartiles (only debt incurred for purchasing the primary residence)									
Up to EUR 25,492	14	36	57	52	3	0	100	1	30
EUR 25,493 to EUR 61,434	18	59	74	41	4	0	100	4	37
EUR 61,435 to EUR 127,779	41	72	88	30	2	0	100	6	35
EUR 127,780 and above	42	62	87	29	7	0	100	2	42
Foreign currency loan									
No	0	46	68	45	4	15	67	20	20
Yes	100	85	98	21	3	0	100	4	42
Loan granted by building and loan association									
No	10	0	50	55	6	20	55	27	15
Yes	43	100	96	25	2	0	100	3	40
Government-subsidized housing loan									
No	43	82	94	6	3	18	60	24	19
Yes	13	30	57	73	5	0	100	4	35
Bank loan									
No	2	9	0	95	11	27	40	35	12
Yes	37	72	100	20	2	0	100	3	38
Government loan									
No	36	69	98	0	4	16	64	22	20
Yes	15	37	41	100	3	0	100	4	36
Mortgage equity withdrawal (at least once)									
No	26	53	74	38	6	16	65	23	0
Yes	33	65	81	38	0	0	100	0	100
Guarantor loan									
No	23	56	74	39	6	17	62	23	17
Yes	36	59	80	36	2	0	100	3	43
Mortgage loan									
No	29	0	89	7	7	35	22	44	8
Yes	28	63	75	41	4	0	100	3	37
Average residual maturity per household in quartiles									
Up to 9 years	18	54	78	38	2	0	100	2	30
10 to 15 years	31	62	76	42	6	0	100	6	28
16 to 20 years	41	60	84	25	3	0	100	2	40
21 years and longer	26	59	75	41	6	0	100	3	49
Variable rate loan²									
No	21	43	56	47	7	23	49	29	14
Yes	32	65	87	33	3	0	100	5	38
Average interest rate per household in quartiles									
Up to 1.1%	27	48	72	31	4	0	100	5	38
1.2% to 2.8%	42	63	76	48	3	0	100	4	35
2.9% to 4.4%	32	59	84	43	2	0	100	2	40
4.5% and higher	21	73	91	23	3	0	100	3	33
Bullet loan									
No	23	57	74	39	4	13	72	18	22
Yes	73	61	95	29	1	0	100	5	48
Repayment amounts in 2007 in quartiles									
Up to EUR 2,940 EUR	10	32	49	57	3	0	100	2	28
EUR 2,941 to EUR 6,000	30	63	81	39	2	0	100	4	45
EUR 6,001 to EUR 10,034	30	68	86	28	3	0	100	4	35
EUR 10,035 and above	44	66	90	27	8	0	100	4	36
Average LTV ratio in quartiles									
Up to 12%	15	34	56	52	3	0	100	2	31
13% to 31%	21	61	79	38	4	0	100	5	33
32% to 60%	36	70	86	32	5	0	100	4	37
60% and above	42	64	86	29	5	0	100	2	42
At least one alternative form of financing									
No	30	60	79	38	3	0	94	9	22
Yes	26	54	72	38	5	0	96	8	27
Tenants	x	x	x	x	x	54	0	47	x

Source: OeNB 2008 HSHW.

¹ All households still indebted for the purchase of their primary residence, with the exception of the columns "Purpose" and "LTV ratio" (all households with any housing debt) as well as "Mortgage equity withdrawal" (all households indebted for the purchase of the primary residence at any point in the past, even if already repaid).

Note: Share refers to the share of households in the respective household category.

Collateralization		Type of interest rate					Repayment		LTV ratio (in % of housing wealth)
Guarantor loan	Mortgage loan	Fixed rate loan	Variable rate loan	Interest- free loan	Interest rate of the lowest- rate loan (if not interest- free)	Interest rate of the highest- rate loan (if not interest- free)	Bullet loan	Repay- ment amounts	
					Mean		Share	Mean	
								EUR	%
44	90	36	66	6	2.8	3.3	12	7,883	51
24	87	35	67	7	2.9	3.4	4	5,801	104
47	92	40	65	4	2.6	3.1	10	7,307	48
50	92	37	66	5	2.9	3.6	16	7,411	37
51	90	30	66	10	2.7	3.1	17	11,438	25
46	87	50	47	8	2.7	3.1	3	3,143	10
38	93	37	65	6	2.7	3.2	2	5,659	28
40	94	31	78	4	2.9	3.6	12	8,320	67
51	87	26	74	8	2.7	3.3	31	14,423	111
39	90	40	62	8	2.9	3.4	5	7,199	46
55	90	27	75	3	2.6	3.1	31	9,594	68
42	77	39	55	11	2.5	2.8	11	6,781	49
45	100	34	74	3	3.0	3.6	13	8,705	53
41	82	27	70	3	3.1	3.3	15	8,493	54
47	100	46	61	11	2.4	3.3	8	7,206	46
37	95	45	37	19	2.2	2.3	2	5,372	34
46	89	33	75	3	2.9	3.5	15	8,652	61
45	85	26	71	3	3.1	3.3	14	8,738	57
42	98	53	58	12	2.3	3.3	9	6,479	36
39	88	37	63	8	2.8	3.3	10	8,095	48
52	94	34	71	3	2.7	3.3	16	7,503	58
0	89	35	66	7	2.9	3.5	7	7,824	53
100	92	38	66	5	2.6	3.1	19	7,958	47
35	0	27	72	6	2.9	3.2	27	7,401	53
45	100	37	65	6	2.8	3.3	10	7,934	50
30	93	49	52	5	2.9	3.3	7	7,597	53
48	93	37	71	10	2.8	3.3	9	7,496	40
43	83	21	80	6	2.8	3.4	14	7,626	57
47	91	27	75	5	2.5	3.1	13	9,403	74
44	92	77	0	15	2.5	2.8	7	6,399	44
44	89	15	100	2	2.9	3.5	15	8,650	57
45	88	33	59	3	1.1	1.1	7	8,312	64
46	92	44	68	2	1.6	2.2	15	7,758	57
53	93	38	78	1	3.2	4.2	21	7,609	54
32	88	31	76	7	5.3	5.8	7	9,174	47
40	92	38	64	7	2.8	3.3	0	7,668	47
69	78	19	81	4	2.8	3.3	100	9,460	90
42	90	53	41	6	2.5	2.7	5	1,477	26
42	91	32	73	6	2.9	3.5	13	4,534	40
42	87	30	73	5	2.9	3.5	13	8,133	77
49	93	30	77	8	2.8	3.4	16	17,681	76
46	89	47	45	10	2.7	3.0	3	4,264	6
41	93	39	70	4	2.9	3.5	7	6,211	20
44	92	33	75	4	2.9	3.6	15	9,715	45
43	87	25	73	8	2.7	3.2	23	11,355	145
36	90	32	70	7	2.9	3.5	12	8,334	52
55	90	42	59	6	2.6	3.1	12	7,207	51
x	x	x	x	x	x	x	x	x	43

Alternative Forms of Housing Finance by Households' Characteristics¹

	No third-party funds required		At least partly financed the primary residence through alternative forms of finance (if third-party funds were required)			No third-party funds required		At least partly financed the primary residence through alternative forms of finance (if third-party funds were required)	
	Number of households	Share in %	Number of households	Share in %		Number of households	Share in %	Number of households	Share in %
	1	2	3	4		5	6	7	8
All households	1,085	32	740	49					
Age									
18 to 29 years	48	31	35	55					
30 to 39 years	159	21	126	56					
40 to 49 years	302	27	220	53					
50 to 59 years	246	30	172	45					
60 to 69 years	210	40	128	44					
70 years and older	120	51	59	40					
Highest educational level completed									
Compulsory education (maximum)	165	44	89	46					
Apprenticeship, vocational school, intermediate or higher technical/vocational school	655	34	442	48					
Academic secondary school, higher-level technical/vocational school	141	24	107	56					
College, university, academy	124	18	102	50					
Marital status									
Single	162	40	98	65					
Married	722	28	522	46					
Divorced	106	34	68	53					
Widowed	95	45	52	44					
Occupational status / work generating the household's main income									
Liberal professions, business owners	73	32	50	55					
Employees	285	24	220	49					
Civil servants	74	20	60	49					
Farmers	54	61	21	65					
Workers	140	25	106	48					
Other	40	19	32	70					
Pensioners	335	41	202	42					
Nonemployed	84	41	49	56					
Total monthly net income									
Up to 795	65	51	33	63					
EUR 796 to EUR 1,432	189	45	100	52					
EUR 1,433 to EUR 2,388	321	31	220	44					
EUR 2,389 to EUR 3,185	212	26	160	47					
EUR 3,186 and above	298	24	227	52					
Province									
Vorarlberg	46	21	37	42					
Tyrol	103	29	76	51					
Salzburg	75	29	55	32					
Upper Austria	203	24	157	59					
Carinthia	59	32	39	66					
Styria	187	43	106	40					
Burgenland	59	22	46	53					
Lower Austria	265	41	157	50					
Vienna	88	22	67	46					
Primary residence used for professional purposes									
No	913	32	628	47					
Yes	172	35	112	62					
Have you ever inherited real estate in your life?									
No	795	28	577	45					
Yes	290	46	163	64					
How was the primary residence acquired?									
Purchase	614	18	505	43					
Inheritance	281	52	139	62					
Inter vivos gift	125	50	62	59					
Combination	31	27	23	87					
Other	34	69	11	64					
Sales price quartiles (primary residence)									
Up to EUR 120,000	267	37	170	47					
EUR 120,001 to EUR 200,000	303	31	210	47					
EUR 200,001 to EUR 300,000	269	28	198	46					
EUR 300,001 and above	246	34	162	59					
No third-party funds required to purchase the primary residence									
No	740	0	740	49					
Yes	345	100	0	0					

Source: OeNB 2008 HSHW.

¹ All households that own their primary residence.

Note: Share refers to the share of households in the respective household category.

EU Representation at the IMF – A Voting Power Analysis

Peter Brandner,
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To analyze the consequences of a hypothetical consolidated EU representation at the IMF, we regroup the 27 EU Member States into a euro area EU constituency and a non-euro area EU constituency (based on the IMF's new quota formula) and calculate voting power measures as proposed by Penrose-Banzhaf (PBI) and Shapley-Shubik (SSI). For theoretical reasons and reasons of empirical plausibility, we favor the results based on the SSI. Concerning the Executive Board, our results confirm the PBI-based evidence in the literature, as we find that the two large constituencies (U.S.A and euro area) would have more voting power than their voting shares indicate. Above majority thresholds of 67%, the PBI and SSI results become increasingly divergent, with the difference being most pronounced at the majority threshold of 85%, at which the PBI has already plunged dramatically whereas the SSI remains more or less constant. Concerning the Board of Governors, we find that voting power depends on both EU-related decision rules and the power measure used. If decision-making within the group is based on EU Council votes, smaller EU Member States tend to gain voting power and would hence have an incentive to push EU consolidation. By contrast, most of the larger EU Member States tend to lose voting power and might consequently be inclined to retain the status quo. However, above all by bundling individual euro area concerns, a consolidated euro area representation would act as a booster for the euro area as a whole.

JEL classification: C71, D71

Keywords: IMF, EU, voting power analysis

The global financial crisis creates feelings of déjà vu: Most of the conclusions at which international policymakers have arrived lately were already listed in the *Report on the international monetary system – how to make it work better and avoid future crisis*, submitted by the Committee on Economic and Monetary Affairs of the European Parliament in 2001. In particular, with reference to EU representation at the IMF, the report – with strong rhetoric – states that

To counterbalance the invasive influence of the United States, EU Member States would do well to bring Europe's weight in the world to bear in the IMF. That would mean insisting on an intelligent realignment of the different 'constituencies', in particular those on which some EU States are somewhat isolated.

The discussion on consolidating representation of EU Member States at the IMF has a long tradition and has only gained additional momentum in the current global financial crisis. As pointed out by Bini Smaghi (2006a), Europe has been slow to improve its external representation in the field of international economic policy for two reasons. First, the degree of European integration varies considerably across countries with regard to structural and financial policies; moreover, the fact that only 16 of 27 EU Member States have the same currency is an added complication. Second, joint representation presupposes giving up a certain number of seats in international forums, a fact that some Member States might see as a loss in international prestige. With international representation

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being fragmented, the EU arguably exerts much less influence on international policy issues than it might do given its economic weight.

Referring to the external representation of the EU, Almuña (2009, p. 5) stated that

... *The Commission has long called for a consolidation of European representation on the boards of the IFIs. In the case of the IMF, the argument for a single consolidated euro-area chair is quite obvious. Yet, Member States concerned jealously guard their seats ...*

When discussing EU representation at the IMF, it is important to focus not only on technical issues such as the number of seats on the Board or the size of IMF quotas assigned to individual countries, but also on the implications of those conditions for actual power. Political power depends not only on a member's share in the votes, but also on its *a priori* voting power, i.e. its ability to cast decisive votes under majority voting rules. In an organization, members with a large voting share may have even greater voting power at the expense of members with smaller voting shares, whereas other members might have no voting power at all, notwithstanding their nominal voting shares.² Individual voting power is closely linked to the voting power of all other members and to the voting or majority rules. In fact, a country may have the incentive to join a group as the loss of individual power would be outweighed by the gain achieved as a member

of a more powerful group. In this respect, the political discussion on consolidating EU representation at the IMF seems to ignore that a priori voting powers are not identical with voting shares within a weighted-voting system, as evidenced by IMF-related empirical analysis (Leech, 2002a; Bini Smaghi, 2006b).

According to the IMF's Articles of Agreement, which also provide the legal basis for the IMF's voting system, a member's voting power should reflect its financial contribution. Therefore, IMF decision-making should be built on voting weights that confer adequate voting power in line with original intentions. Following an overview of the current governance structure of the IMF (sections 1 and 2), we analyze the voting power implications of consolidating EU representation at the IMF Executive Board and at the Board of Governors. On the basis of the new quota formula, agreed upon in 2008 and still to be ratified by many IMF member countries, we calculate voting power indices to compare the distribution of voting power under the *current* structure with a *reorganized* structure based on *consolidated/fully-fledged EU membership* (sections 3 and 4).

In particular, we look deeper into the difference between nominal voting shares and a priori voting power and evaluate whether individual EU Member States gain or lose voting power in our proposed structure as compared to the status quo with the new quota formula.³

² *The voting power of Luxembourg in the EEC Council of Ministers before 1973 is an often-cited classic example. Although formally having one vote, Luxembourg did not have the power to swing decisions in the Council given the prevailing majority rules and distribution of votes – i.e. Luxembourg's voting power was actually zero.*

³ *Leech (2002a) calculates the voting weights that should be assigned to IMF member countries to align the distribution of voting power with the distribution of IMF quotas. However, this study does not deal with the issue of how to reduce the gap between voting shares and voting power.*

1 Overview of Governance Structures at the IMF

1.1 Representation at the IMF under the IMF’s Articles of Agreement

The IMF was established in 1944 at the Conference of Bretton Woods, with the number of founding members totaling 44 states. At that time, membership in most international organizations was traditionally based on statehood. Article II, Section 1 (Original members) of the Articles of Agreement stipulates that

The original members of the Fund shall be those of the countries represented at the United Nations Monetary and Financial Conference whose governments accept membership before December 31, 1945.

Section 2 (Other members) of the Articles of Agreement adds:

Membership shall be open to other countries at such times and in accordance with such terms as may be prescribed by the Board of Governors. These terms, including the terms for subscriptions, shall be based on principles consistent with those applied to other countries that are already members.

However, according to Gold (1974), a former legal IMF counsellor, the IMF should not preclude from membership a single entity in international law having the scope of a country.

Hornig (2005) analyzes the legal and institutional implications of IMF membership for the ECB and assesses the relevant provisions of the EC Treaty and the Articles of Agreement. He basically acknowledges that the IMF is a state-based institution, but mentions that in the Balance of Payments Statistics (IMF, 2000), the term “country”

... does not in all cases refer to a territorial entity that is a state as understood by international law and practice; the term also covers some non sovereign territorial entities, for which statistical data are maintained and provided internationally on a separate and independent basis ...

A frequently cited legal difficulty for consolidating EU representation at the IMF concerns Article XII, Section 3,⁴ which stipulates that

(a) The Executive Board shall be responsible for conducting the business of the fund, and for this purpose shall exercise all the powers delegated to it by the Board of Governors.

(b) The Executive Board shall consist of Executive Directors with the Managing Director as chairman. Of the Executive Directors:

(i) five shall be appointed by the five members having the largest quotas; and

(ii) fifteen shall be elected by the other members.

For the purpose of each regular election of Executive Directors, the Board of Governors, by an eighty-five majority of their total voting power, may increase or decrease the number of Executive Directors.

Under Article XII, the five countries holding the largest IMF quotas must appoint an Executive Director, and they must not form a joint representation (*Constituency*) with other member countries at the Executive Board. Hence, consolidation of EU representation which affects any of these five countries would only be feasible under an amendment of the Articles of Agreement. According to Article XXVIII (a), this amendment would need to be agreed upon by three-fifths of the members and 85% of the total voting share.

⁴ *The second amendment of the Articles of Agreement in 1978 set the size of the Executive Board at 20 Directors, however with the proviso that “... for the purpose of each regular election of Executive Directors, the Board of Governors, by an eighty-five percent majority of the total voting power may increase or decrease the number of elected Directors.” (Van Houtven, 2002).*

The formation of constituencies is not formally guided by the Articles of Agreement. In the past, formal rules (*Decisions*) have been passed to safeguard some equality of power between constituencies, but over time these rules have gradually lost effectiveness and are not applied any more. According to Martin and Woods (2005), elected directors were originally supposed to have a minimum voting power of 19% and a maximum voting power of 20%. By 1970 the margins had been altered to 6% and 13%. The maximum percentage of votes to be wielded by an elected Director is currently 9%. At present, 15 Executive Directors represent constituencies whose voting share is below 4%.

Elected Executive Directors serve for a two-year term. In a number of constituencies, the Executive Director is selected by the country with the highest voting share within the constituency, in others there are rotation arrangements. Each constituency defines its own *modus operandi* (*Constituency Agreement*), which determines the rules of appointment and representation. For instance, the Constituency Agreement between Austria, Belarus, Belgium, the Czech Republic, Hungary, Kazakhstan, Slovakia, Slovenia and Turkey covers a period of ten years.

1.2 The System of IMF Constituencies

Table 1 shows the current representation of the 27 EU Member States at the Executive Board, based on the old quota formula. EU Member States are represented in ten (out of the total of 24) constituencies, three single-state (Germany, France, United Kingdom) and seven mixed-state constituencies. Presently, EU Member States hold eight chairs, with euro area Member States accounting for six chairs (Germany,

France, Italy, Netherlands, Belgium, Spain) and non-euro area EU Member States for two (United Kingdom, Sweden). The two other mixed-state constituencies with an EU Member State are chaired by Canada and Switzerland. In sum, EU Member States have an aggregate voting share of 32.1% (euro area Member States: 22.9%; non-euro area EU Member States: 9.2%).

Within the seven mixed-state constituencies, there are five constituencies which are dominated by one country, namely Italy (77.8% of the constituency's total voting shares), Netherlands (49.0%), Belgium (40.6%), Canada (79.3%) and Switzerland (56.3%). The two other mixed-state constituencies are more balanced; Spain – with a relative voting share of 31.2% – chairs the South-American constituency, followed by Venezuela (27.2%) and Mexico (32.2%). Finland currently chairs the Nordic constituency under a biannual rotation scheme, with a relative voting share of 16.9%. In the same constituency, Sweden has a relative voting share of 31.7% and Norway of 22.2%.

The dispersion of EU Member States across constituencies complicates the pursuit of a common strategy at the IMF. Phillips (2006) argues that EU Member States are simply incapable of following a common position given the mixed nature of their constituencies. In the present situation, this is likely to be most difficult for Spain, Poland and Ireland, which are the sole EU Member States in their respective constituencies.

McNamara and Meunier (2002) argue that, given the single monetary policy, it would be reasonable for the euro area countries to reorganize themselves at the IMF as a more coherent and streamlined grouping. However, the larger euro area countries would

prefer to keep the status quo, since unlike within the EU, where they may well remain dominant players even as euro area members, they are unlikely to influence decisions in international organizations such as the IMF to a similar extent otherwise. Smaller EU Member States, by contrast, would be more inclined to pool representation at the IMF, although Belgian and Dutch policymakers could be reluctant to give up their chairs.

In the past, countries have changed constituencies quite often. The search for a more influential role within a constituency (Director, Alternate Director, Senior Advisor, Advisor) and geographical considerations seemed to play major roles. For example, in the 1950s Indonesia joined the Italian-chaired constituency, then switched to a constituency of Islamic countries with North-African countries and Malaysia, before it eventually formed a more geographically motivated constituency with countries such as Korea, the Philippines and Vietnam in 1972. Switzerland became a member of the IMF in 1992 and was accepted as head of a constituency with CEE and a few CIS countries.⁵ Spain, Poland and Greece used to be members of a constituency chaired by Italy. Spain left the constituency in 1978 to become a member of a Central-American constituency, holding the chair in turn with Mexico and Venezuela. Poland decided to join the

Swiss-headed constituency to hold the position of Alternate Executive Director. Greece joined the Iran-chaired constituency to obtain the position of Alternate Executive Director but switched back to the Italian-headed constituency when Spain vacated the Alternate chair.

The five IMF members with the highest quotas used to be the U.S.A., the United Kingdom, China, France and India. In 1944, the U.S.A. insisted that the quota share of the British Commonwealth must not exceed the U.S. share (36.2%), so that the U.K., per se, received a starting quota of 17.1%. In 1958, Syria and Egypt informed the Management of the IMF about their intention to become a single member with a single quota.⁶ The two individual quotas were aggregated; their basic votes, however, were reduced to the scope of a single member. At the end of 1961, the United Arab Republic was split again at the request of Syria. When the Treaty of Rome entered into force in 1958, the six founding members of the European Economic Community (EEC) held 15.75% of the IMF's total voting shares, compared with 25.78% held by the U.S.A. at the time.⁷ In 1960, Germany replaced the Republic of China (Taiwan) and in 1970 Japan replaced India in the group of the Directors to be appointed. In 1978, the size of the Board was raised to 21, when Saudi Arabia received the right to ap-

⁵ Azerbaijan, the Kyrgyz Republic, Poland, Serbia and Montenegro, Tajikistan, Turkmenistan and Uzbekistan.

⁶ The Executive Board deemed neither an amendment of the Articles of Agreement nor a specific resolution by the Board of Governors as necessary. According to Mathieu et al. (2003), the Executive Board did not see any reason "to adopt a membership resolution establishing terms that had been laid down already and requiring actions, such as the payment of subscriptions and the agreement on par value that had been taken already." Gold (1974) states that the IMF continued "to hold the currencies of the two regions, have separate depositories in Cairo and Damascus for the two currencies, deal through two fiscal agencies, make separate calculations of monetary reserves."

⁷ Since then, the size of the U.S. voting share has declined further, mainly as a result of the increase in member countries, to currently 16.78%. As already mentioned, by comparison, the aggregated EU share is 32.1% and the aggregated euro area voting share 22.9%.

Table 1

EU Constituencies at the IMF Executive Board

EU Member States						Other countries			Executive Board chairs		Voting share in the IMF / in the constituency
Euro area			Non-euro area						Executive Director	Alternate Executive Director	
Country	Voting share		Country	Voting share		Country	Voting share				
	IMF	Constituency		IMF	Constituency		IMF	Constituency			
%											
Germany	5.88								Germany	Germany	5.88
France	4.86								France	France	4.86
			United Kingdom	4.86					United Kingdom	United Kingdom	4.86
Italy	3.20	77,84				Albania	0.03	0.81	Italy	Greece	4.10
Portugal	0.40	9,81				San Marino	0.02	0.46			
Greece	0.38	9,32				Timor-Leste	0.01	0.36			
Malta	0.06	1,40									
Netherlands	2.34	48,97	Romania	0.48	9.96	Ukraine	0.63	13.19	Netherlands	Ukraine	4.78
Cyprus	0.07	1,55	Bulgaria	0.30	6.28	Israel	0.43	9.00			
						Croatia	0.18	3.68			
						Bosnia-Herzegovina	0.09	1.83			
						Georgia	0.08	1.65			
						Moldova	0.07	1.40			
						Armenia	0.05	1.10			
						Macedonia, FYR	0.04	0.89			
Belgium	2.09	40.63	Hungary	0.48	9.33	Turkey	0.55	10.67	Belgium	Austria	5.14
Austria	0.86	16.65	Czech Republic	0.38	7.41	Belarus	0.19	3.61			
Slovak Republic	0.17	3.36				Kazakhstan	0.18	3.43			
Luxembourg	0.14	2.67									
Slovenia	0.12	2.25									
Finland	0.58	16.90	Sweden	1.09	31.73	Norway	0.77	22.24	Sweden ¹	Norway ¹	3.44
			Denmark	0.75	21.87	Iceland	0.06	1.87			
			Lithuania	0.08	2.22						
			Latvia	0.07	1.99						
			Estonia	0.04	1.18						
Spain	1.39	31.16				Venezuela	1.21	27.21	Spain ²	Mexico ²	4.45
						Mexico	1.43	32.21			
						Guatemala	0.11	2.38			
						Costa Rica	0.09	1.92			
						El Salvador	0.09	1.99			
						Honduras	0.07	1.57			
						Nicaragua	0.07	1.57			
Ireland	0.39	10.71				Canada	2.89	79.30	Canada	Ireland	3.64
						Jamaica	0.13	3.70			
						Barbados	0.04	1.15			
						Antigua and Barbuda	0.02	0.48			
						Belize	0.02	0.54			
						Dominica	0.01	0.41			
						Grenada	0.02	0.46			
						St. Kitts and Nevis	0.02	0.42			
						St. Lucia	0.02	0.50			
						St. Vincent and the Grenadines	0.02	0.41			
			Poland	0.63	22.55	Switzerland	1.57	56.34	Switzerland	Vacant	2.79
						Uzbekistan	0.14	4.86			
						Azerbaijan	0.08	3.01			
						Kyrgyz Republic	0.05	1.84			
						Tajikistan	0.05	1.81			
						Turkmenistan	0.05	1.62			
Total	22.92			9.15							43.95

Source: IMF (voting shares as at June 30, 2009). ¹ Chair rotates every two years. ² Chair rotates between Spain, Mexico and Venezuela.

point an Executive Director by itself, reflecting the fact that in the two preceding years the Saudi riyal had been one of the two most frequently used currencies in IMF transactions. In 1980, the People's Republic of China assumed representation and its quota was augmented to an extent that permitted China to elect an Executive Director by itself. In 1981, the quota of Saudi Arabia was raised in an ad hoc manner so that Saudi Arabia could also elect an Executive Director. In the wake of the dissolution of the Soviet Union, the size of the Board was raised to 24. Ex-Soviet Union Member States and some other formerly centrally planned economies joined various constituencies, and Russia, because of the scope of its quota, was entitled to elect an Executive Director.

1.3 Decision-Making

The IMF is governed by two decision-making bodies: the Board of Governors and the Executive Board. The Board of Governors is the highest decision-making body of the IMF. It consists of one Governor and one alternate Governor for each member country. While the Board of Governors has delegated most of its powers to the IMF's Executive Board, it retains the right to approve quota increases, special drawing right (SDR) allocations, the admittance of new members, the compulsory withdrawal of members, and amendments to the Articles of Agreement and By-Laws. The Board of Governors also elects or appoints Executive Directors and is the ultimate arbiter on issues related to the interpretation of the IMF's Articles of Agreement. The Board of Governors is advised by the International Monetary and Financial Committee (IMFC). The IMFC has 24 members, drawn from the pool of currently 186 Governors. Its structure

mirrors that of the Executive Board and its current 24 constituencies. The IMFC discusses matters of common concern affecting the global economy and also advises the IMF on the direction of its work. The second decision-making body is the Executive Board, which takes care of the daily IMF business. For this purpose, the Executive Board exercises all the powers delegated to it by the Board of Governors.

IMF decisions are taken by weighted voting. The individual voting share depends on the quota and the number of basic votes assigned to each member country. According to Article XII, Section 5(a), each IMF member has 250 basic votes plus one additional vote for each SDR 100,000 of quota. Section 5(c) stipulates that all decisions of the IMF shall be made by a majority of the votes cast.

However, decisions are generally not taken by formal voting but by consensus at the Board of Governors and the Executive Board. This is a long-standing tradition. When the IMF was founded with the U.S.A. and the U.K. as the two dominant countries in terms of voting and political power, the view prevailed that – because of the variety in membership – decision-making had to be conducted in a consensual way. A cooperative decision-making framework evolved that generally led to middle-of-the-road solutions where differing interests of the member countries had to be reconciled and, in particular, the interests of developing countries need to be protected (Van Houtven, 2002).

This cooperative decision-making framework is reflected in the By-Laws, Rules and Regulations (IMF, 2006). Referring to the Board of Governors, the *By-Laws of the International Monetary Fund*, state in Section 11 (*Voting*) that

Except as otherwise specifically provided in the Articles of Agreement, all decisions of the Board of Governors shall be made by a majority of the votes cast. At any meeting the Chairman may ascertain the sense of the meeting in lieu of a formal vote but he shall require a formal vote upon request of any Governor. Whenever a formal vote is required the written text of the motion shall be distributed to the voting members.

As regards the Executive Board, the *Rules and Regulations of the Monetary Fund* stipulate in Section C that:

C-10. The Chairman shall ordinarily ascertain the sense of the meeting in lieu of a formal vote. Any Executive Director may require a formal vote to be taken with votes cast as prescribed in Article XII, Section 3(i), or Article XXI (a) (ii).

C-11. There shall be no formal voting in committees and subcommittees. The Chairman of the committee and subcommittee shall determine the sense of the meeting (including alternative points of view) which shall be reported.

The “*sense of the meeting*” is generally regarded as a position that would have sufficient votes to come to a decision if a vote were taken. Although “*consensus*” normally means “*unanimity*,” a large majority is generally regarded as sufficient for many decisions. However, this does not necessarily mean that voting shares are irrelevant. Formal voting shares exert a substantial influence on the de facto decision-making process.⁸

If complex issues are on the table, the Chairman of the Executive Board⁹

urges the Board to consider matters at least until a broad majority has emerged on the issue under discussion. It is a generally accepted principle that “*nothing will be decided until everything is agreed upon.*” This principle, which equals a de facto potential veto power for smaller countries, ensures that – even without a formal vote – minority views are protected in important decisions where special majority thresholds are formally needed.¹⁰

Board discussions on tricky issues such as surveillance and general policy formulation generally end with a *Chairman’s Summing Up* or *Chairman’s Concluding Remarks*. While the *Chairman’s Concluding Remarks* aim to capture, for instance, the progress of a policy debate in a more tentative sense, thereby suggesting how the debate can be moved on, the *Chairman’s Summing Up* comprises the main differences of opinion between Executive Directors during a Board discussion as well as differences between the Board’s views and the position of the staff.¹¹ The parts of a *Summing Up* that mirror the *sense of the meeting* have the character and the effect of a Board decision. However, decisions which require a special voting majority of 70% or 85% are submitted by the Chairman to the Board for a straight up-or-down vote before the meeting is closed (Van Houtven, 2002). Hence, in practice, IMF decisions are rarely brought to a vote. As Leech

⁸ The impact Executive Directors can have on IMF decision-making is nevertheless contingent not only on their voting share but also on their persuasiveness, technical expertise, diplomatic skills and period of service. This phenomenon can also be observed in the Governing Council of the ECB or the Council of Ministers at the EU level.

⁹ According to the Articles of Agreement, Article XII Section 4 (a), “The Managing Director shall be chairman of the Executive Board, but shall have no vote except a deciding vote in case of an equal division. He may participate in meetings of the Board of Governors, but shall not vote at such meetings.”

¹⁰ Decision-making at the Board is, however, not 100% consensual. For instance, when the Board approved Mexico’s request for a Stand-by Agreement on February 1, 1995, several Board members from Western European countries abstained for various reasons.

¹¹ If the members of a constituency cannot reach a common understanding on the opinion the Executive Director may express at the meeting of the Board, the Executive Director can request the different views to be mentioned in the minutes of the meeting and remain free to abstain from or object to a particular decision.

(2002a, p. 379) notes, formal voting is impeded with the intent “to avoid the element of confrontation associated with a contested vote.”

Ordinary decisions, which are the bulk of decisions taken by the Executive Board, require a simple (weighted) majority of the votes cast. There are several other cases, specified in the Articles of Agreement, which are subject to special majorities. The reason for the existence of special majorities is mainly historical: At the Bretton Woods conference, the U.S.A. aimed to reserve the right to exercise a veto over the most important decisions and proposed a special majority of four-fifths for major decisions. The British delegation under John Maynard Keynes argued – for various reasons – against special majorities, bringing forward the argument that higher majority rules would also limit the influence of the U.S.A. on important decisions, since a smaller group of countries would be able to block U.S. initiatives. However, the U.S. view prevailed and the original Articles of Agreement foresaw several special majorities for nine categories of decisions. The number was increased to 21 on the occasion of the first amendment of the Articles (taking effect on July 28, 1969), raised further to over 50 in the second amendment (taking effect on April 1, 1978) and increased by one in the third amendment (taking effect on November 11, 1992). In the second amendment, the number of special majorities was simplified and reduced to the current special majority rules of 70% and 85%.

Rapkin and Strand (2006) mention that the emergence of special majorities in the decision-making process of international organizations frequently dis-

criminate against developing countries and propose that the current special majority provisions be rationalized. They also argue that the U.S.A. exerts a disproportionately large 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 its direct transmission of U.S. concerns to the IMF management/staff and to individual members. This is called the *Treasury effect* (Evans and Finnemore, 2001). A possible solution to avoid the dominance of one country would be to determine special majorities just above a country’s total vote or to wait until the voting share of the U.S.A. falls below 15%. This scenario would occur in the event of future general quota increases if the U.S.A. were to agree to its nominal voting share not being increased.

Decisions which require special majorities range from cases that occur only on rare occasions, for instance the suspension of voting rights or a country’s compulsory withdrawal, to more frequently occurring cases: These – highly sensitive – decisions (13 categories) are to be taken by the Board of Governors and cannot be delegated to the Executive Board. The Executive Board, as the main decision-body of the IMF in day-to-day work, can decide upon around 40 categories of decisions requiring special voting majorities. 16 categories fall under the 85% majority rule; the remaining categories, which refer mainly to financial and operational issues, have a majority rule of 70%.¹²

With a voting share of 16.78%, the U.S.A. is the only country able to veto major decisions. However, as Leech

¹² For special majority rules in the context of financial operations see, for instance, IMF (2001, p. 172).

and Leech (2005) point out, the veto power does not necessarily mean that the U.S.A. would be able to control the IMF. The 85% majority threshold would rather tend to balance voting power to a considerable extent. Indeed, it gives the U.S.A. the power to prevent action/hinder initiatives by other countries but also restricts the U.S.A.'s power to initiate action, since a group of countries with a sufficient voting share would be able to block any U.S. effort.

2 External Representation of the EU and EU Representation at the IMF

The idea of consolidating EU representation at the IMF has been launched several times in the past. For instance, Ahearne and Eichengreen (2007) recommend consolidating Europe's representation at the IMF by creating either a single chair for the EU as a whole or a pair of chairs, one for the euro area Member States and one for the other EU Member States. They argue that a single EU seat or even a pair of seats would make the EU, with its cohesive block of votes, a key swing voter. Eurodad (2006) argues along the same lines. Truman (2006) mentions that under EU consolidation, Europe would be better able to speak with one voice and could potentially exert greater influence. He puts forward a four-step procedure under which the EU Member States would be grouped into two constituencies (euro area Member States and the remaining EU Member States) and eventually form a single combined EU constituency. The remaining chairs currently held by EU Executive Directors could go to new constituencies, or

the overall size of the Executive Board could be reduced.

2.1 The EU's External Representation according to the EC Treaty

The legal basis for the external representation of the EU is Article 111(4) of the EC Treaty, stating that

... the Council [in composition of Member States without a derogation] shall, on a proposal from the Commission and after consulting the ECB, acting by a qualified majority decide on the position of the Community at international level as regards issues of particular relevance to economic and monetary union and on its representation, in compliance with the allocation of powers laid down in Articles 99 and 105.¹³

Reference to Article 99 means that – where economic policies are concerned – EU external representation should reflect the obligation of Member States to regard their economic policies as a matter of common concern and to coordinate these policies within the Council (Horng, 2005). The reference to Article 105 means that the ECB has to be involved when monetary and foreign exchange operations are discussed. According to the Treaty of Nice, which entered into force on February 1, 2003, the Council is entitled to define arrangements on the external representation more precisely by qualified majority voting. In brief, the Council, the Commission and the ECB are involved in various aspects of external representation, whereby the Commission and the ECB have the right to initiate on the one hand the formulation of exchange rate agreements regarding the euro in relation to non-Community currencies and on the other hand the

¹³ Amended by Article 2(6) of the Treaty of Nice, OJ C 80/1/2001.

formulation of general exchange rate policies with third countries.¹⁴ In addition to the aforementioned Article 111, the EC Treaty contains several other specific provisions which stipulate that EU Member States are obliged to closely cooperate in international forums. This close cooperation, however, is not intended to prevent individual Member States from assuming international rights and obligations such as membership of the IMF¹⁵ as long as they gear their external obligations towards the Community framework. In this context, the European Court of Justice¹⁶ states that

... when it appears that the subject matter of an international convention falls in part within the competence of the community and in part within that of Member States, it is important that there is a closer association between the institutions of the community and the Member States both in the process of negotiation and conclusion and in the fulfilment of the obligations entered into. This duty of cooperation ... results from the requirement on unity in the international representation of the community ...

It is, however, clear that EU Member States would need a strong common political consensus to set the process of consolidating IMF representation in motion. At the December 1998 European Council in Vienna, the heads of state or government agreed

... that, while trying to reach early solutions pragmatically with international partners, these solutions should be further developed over time adhering to the following principles:

- the Community must speak with one voice;*
- the Community shall be represented at the Council/ministerial level and at the central banking level;*
- the Commission will be involved in the Community external representation to the extent required to enable it to perform the role assigned to it by the Treaty ...*

On this basis, the Council agreed on concrete arrangements related to the G-7 and the IMF:

... The President of the ECOFIN Council, or if the President is from a non-euro area Member State, the President of the Euro 11, assisted by the Commission, shall participate in meetings of the G7 (Finance) (Annex 2). The ECB, as the Community body competent for monetary policy, should be granted observer status at the IMF board. The views of the European Community/EMU on other issues of particular relevance to the EMU would be presented at the IMF Board by the relevant member of the Executive Director's office of the Member State holding the euro Presidency, assisted by a representative of the Commission. The European Council invites the Council to act on the basis of a Commission proposal incorporating this agreement ...

Moreover, according to the Presidency Conclusions, Annex 2: “Report to the European Council on the state of preparation for Stage 3 of EMU, in particular the external representation of the Community,” as regards the representation at the IMF:

... The Council considers that pragmatic solutions for presenting issues of particular relevance to EMU may have to be sought which do not require a change in the Articles of Agreement of the IMF: A first neces-

¹⁴ As the short discussion above shows, the division of power and responsibility between EU institutions is rather complex. A thorough legal analysis, though, is clearly beyond the scope of this paper, hence we refer to more comprehensive surveys, such as Steinki (2003) or Herrmann (2002).

¹⁵ According to Article 111(5), “Without prejudice to Community competence and Community agreements as regards economic and monetary union, Member States may negotiate in international bodies and conclude international agreements.”

¹⁶ ECJ Opinion 2/91 [1993] ECR I – 1061, paragraphs 36 and 37.

sary step has already been taken; the IMF Executive Board agreed to grant the ECB an observer position at that Board; secondly, the views of the European Community/EMU would be presented at the IMF Board by the relevant member of the Executive Director's office of the Member State holding the Euro 11 Presidency, assisted by a representative from the Commission ...

In sum, from a legal point of view, even if all EU Member States were to join the same IMF constituency, each Member State would retain its own rights and responsibilities according to the Articles of Agreement. The Executive Director would then cast the vote for the constituency as a whole. Alternatively, the EU or the euro area could also become a fully-fledged IMF member in its own right. This, however, would not only change the composition of the Executive Board and the Board of Governors, it would deeply affect the governance structure of the IMF in many other respects, for instance in terms of surveillance under Article IV or balance of payments support, since funds could then only be transferred to the new legal entity instead of individual countries.

Mathieu et al. (2003) cite two possibilities of setting up a single quota. In the first scenario, EU Member States would join a single EU constituency while either maintaining individual quotas, or following the example of the United Arab Republic, aggregating individual quotas to a single quota. In the second scenario, the EU would become a fully fledged single member with a new quota¹⁷ that would, however, be

smaller than the sum of the individual quotas, but still considerably higher than the current U.S. quota. The authors doubt whether an EU quota that is nearly twice the size of the U.S. quota would be politically feasible. This would endow the EU, for instance, with the power to veto major IMF decisions, even for 70% majority votes.¹⁸

2.2 Intra-EU Coordination at the IMF

In principle, coordination of EU positions at the IMF takes place at the *EURIMF*, an informal group of representatives of EU Member States in Washington D.C., which comprises Executive Directors, alternates and counsellors. Moreover, a representative from both the Commission Delegation and the ECB, each seated in Washington, participate in *EURIMF* meetings. An additional forum in Washington is the so-called *mini EURIMF*, which includes only the Executive Directors of EU Member States. Another formal coordination mechanism is the *SCIMF* (*Sub-Committee on IMF-related issues*), established in 2001 as a substructure to the *EFC* (*Economic and Financial Committee*), which prepares the meetings of the Ecofin Council (the EU Council meeting in the composition of economic and finance ministers). In the end, according to Article 111 of the EC Treaty, the Ecofin Council is formally in charge of major IMF issues. For a detailed discussion of the *EURIMF* and the *SCIMF* see, for instance, Eurodad (2006).

¹⁷ In this case, the newly calculated EU quota does not correspond to the aggregated individual quotas, since intra-EU trade in particular would have to be eliminated.

¹⁸ A 70% majority is for instance required for many financial and operational decisions and the suspension of voting rights.

3 Voting Power Analysis and Consolidating EU Representation

3.1 Voting Power Analysis

Voting power analysis is useful for understanding decision-making processes in collective bodies that are governed by voting rules, as it provides measures of players' *a priori* voting power. A priori voting power is a component of the actual (or *a posteriori*) voting power that voters derive solely from the voting rule itself. Thus, it is computed without regard to (or in ignorance of) information about the voters (preferences, complex interaction of real-world factors, etc.) and the nature of the issues put up for a vote (Felsenthal et al., 2003).

Power index methodology is widely used in social sciences to measure the *a priori* voting power of members of a committee. As Felsenthal and Machover (2004) observe, the Penrose-Banzhaf index and the Shapley-Shubik index are by far the most important measures of *a priori* voting power, and hence are also the most widely used. Penrose (1946, 1952) proposed a probabilistic measure of *a priori* voting power, to be interpreted as the probability that the given voter can be decisive (or critical in terms of achieving a majority). Banzhaf (1965) took the same approach as Penrose, but focused on the relative power of each voter (as compared with Penrose's absolute measure). Originally, the Shapley and Shubik (1954) measurement of voting power was derived from the theory of cooperative games with transferable utility.

Power measurement theory and its game-theoretic extensions rely either on an axiomatic approach or on a probabilistic approach.

In an axiomatic approach, each power index is interpreted as a unique measure embodying a set of properties that

characterizes it. While this approach has attracted much attention in the literature, it has been criticized for its abstract nature: Axiomatizations may give plausible conditions for the outcome prediction, but they pay little attention to the meaning of the axioms in terms of the voting situation that underlies simple games.

In a probabilistic approach (Niemi and Weisberg, 1972; Straffin, 1977, 1988), the concepts underlying the power indices have a direct probabilistic interpretation, an interpretation disregarded in the game-theoretic literature: Paterson (2006), building on the work of Straffin (1977), demonstrated that if the *number of members voting in favor of (or against) the issues discussed is equally likely* – i.e. the uniform distribution on $\{0, 1, \dots, n\}$ – then the voting power of individual members corresponds to the Shapley-Shubik index. If the members of the voting body each vote with a *probability of 0.5 for – and against – regardless of the issue discussed*, then the voting power of individual members corresponds to the Penrose-Banzhaf index. In other words, the Penrose-Banzhaf measure assumes that all coalitions are equally likely, whereas the Shapley-Shubik index assumes that all sizes of coalition are equally likely.

Laruelle and Valenciano (2001) developed a more general measure of voting power as a probability of the corresponding voter becoming crucial in a precise sense. Their general concept of voting power measurement takes both the voting rule and the probability distribution over the voting configurations as inputs and is not limited to any particular power index or measure in the traditional sense (Laruelle and Valenciano, 2004).

A similar definition of voting power that also encompasses the two major

power indices of Shapley-Shubik and Penrose-Banzhaf was developed by Paterson (2006). He regarded the output of a yes/no voting process in terms of the number (or percentage) of participants who vote in favor of the proposition put up for a vote (“voting poll”). Paterson (2006) then defines the voting power of a voting body member as the expected decisiveness of his/her vote for a given distribution of the voting poll; the Shapley-Shubik and Penrose-Banzhaf indices are uniquely defined by their corresponding poll distributions.

Recently, Turnovec (2007) showed that both the Shapley-Shubik and Penrose-Banzhaf index could be successfully derived as cooperative game values, and at the same time both of them can be interpreted as probabilities of being in some decisive position (pivot, swing – see below) without using cooperative game theory at all.

3.2 Measuring Voting Power

Formally, decision-making at the IMF (as a voting body) can be thought of as a weighted voting game, which is a subclass of simple games. A simple game, introduced by Von Neumann and Morgenstern (1944), is a n person cooperative game (N, v) where the n members of the voting body are represented by a finite set $N = \{1, \dots, n\}$ and a characteristic function $v: 2^N \rightarrow \{0, 1\}$ such that $v(\emptyset) = 0$ and $v(S) \leq v(T)$ whenever $S \subseteq T$, the subsets S and T representing coalitions of members (a voting configuration). A coalition wins if $v(S) = 1$, and loses if $v(S) = 0$; let W denote the set of all winning coalitions. The weighted voting game is represented by $[q; w_1, \dots, w_n]$ with $0 < w_i < q$ for all i where w_i represents the voting weight of member i and q is the quota needed to win. Now the characteristic function is defined

by $v(S) = 1$ if $w(S) \geq q$, and $v(S) = 0$ otherwise, where $w(S) = \sum_{i \in S} w_i$.

A power index is defined in terms of the number of times that a player can “swing” the decision by transferring his/her vote to a coalition that would lose without – but win with – his/her vote. A (negative) swing for voter i is defined as a pair of voting configurations $(S_i, S_i \setminus \{i\})$ such that S_i wins but $S_i \setminus \{i\}$ loses. In terms of voting weight, S_i is a swing if $w(S_i \setminus \{i\}) < q \leq w(S_i)$. A voter i is pivotal in a sequence of one of the $n!$ possible orderings of the n voters if he/she casts the vote that puts the total vote at or over the required quota.

The Penrose index (PI) (or absolute/non-normalized Penrose-Banzhaf index) for voter i is the proportion of votes which are swings for voter i and is defined as

$$\beta_i = \frac{1}{2^{n-1}} \sum_{S \subseteq N, i \in S} (v(S) - v(S \setminus \{i\}))$$

The Shapley-Shubik index (SSI) for voter i is the probability that voter i is pivotal and is defined as

$$\varphi_i = \sum_{S \subseteq N, i \in S} \frac{(s-1)!(n-s)!}{n!} (v(S) - v(S \setminus \{i\}))$$

Both indices measure the absolute power of each voter i as a probability. Since $\sum_{i=1}^n \varphi_i = 1$, the SSI may itself also be treated as defining a probability distribution over all voters: the power index is then a probability of a voter being critical for the outcome of the voting decision. A corresponding statement is not true for the PI, as it does not in general sum to unity (Paterson, 2006). Normalizing the PI with the total number of swings for all voters yields the Penrose-Banzhaf index (PBI, or normalized Banzhaf index). The PBI is interpreted as the share of voter i in the power of all voters to influence decisions by means of a swing.

With the probabilistic interpretation in mind, what is the difference between PI (PBI) and SSI? The answer can be found by examining the voting poll distributions. Following Paterson (2006), the *decisiveness* d_i of a voter i for a particular poll (with $0 \leq s \leq n$ votes in favor, $s = |S|$) is the potential of his/her vote (for/against) to be critical for the outcome of the voting decision. Considering voting configurations S , i.e. voting coalitions that have exactly s members who vote in favor, and the configuration S_i^*

$$S_i^* = \begin{cases} S \setminus \{i\} & \text{if } i \in S \\ S \cup \{i\} & \text{if } i \notin S \end{cases}$$

then decisiveness is defined as

$$d_i(s) = \sum_{S \in \mathcal{S}_s} |v(S) - v(S_i^*)| / \binom{n}{s}$$

Decisiveness $d_i(s)$ is thus the share of voting configurations (coalitions) that are (positive or negative) swings for each voter i , and depends only on the parameters represented by voting weights and the threshold that defines a winning coalition or majority. It does not itself depend on any probabilistic aspects – and it is identical for the Shapley-Shubik or the Penrose-Banzhaf approaches.

Paterson (2006) defines expected decisiveness δ_i of voter i for a poll distribution $p(s)$ as

$$\delta_i = \sum_{s=0}^n d_i(s) \cdot p(s)$$

This makes it possible to differentiate between SSI and PBI voting power indices solely in terms of the poll distribution. He shows that for the SSI,

$$p_{SSI}(s) = 1/(n+1), \quad s = 0, \dots, n$$

i.e. a uniform or “random” distribution of poll outcomes on $\{0, \dots, n\}$, and for the PI (absolute PBI),

$$p_{PI}(s) = \binom{n}{s} / 2^n, \quad s = 0, \dots, n$$

i.e. the binomial distribution on $\{0, \dots, n\}$ with probability $1/2$.

We prefer the SSI as opposed to the PBI. Our preference is based on the analysis of Paterson (2006). Paterson provides evidence on the consequences of the underlying poll distributions (uniform versus binomial distribution); the binomial distribution leads to voting results that hover around 50% when the number of voters is increased, whereas the uniform distribution does not influence the probability of poll outcomes with an increasing number of voters.

In order to obtain our empirical results we used the software by Leech and Leech (www.warwick.ac.uk/~ecaae/).

3.3 Consolidating EU Representation at the Executive Board

In order to conduct the empirical analysis, we adapt the current constituency structure and establish EU constituencies:¹⁹

Kenen (2007) argues that an Executive Board with “... *only twenty members may be too large for the efficient conduct of business, and one with twenty-four is surely too large. It would be difficult, however, to reduce the size of the Board, even, to return to twenty members without unifying EU representation.*” He proposes reorganizing the 27 EU Member States into six constituencies (one each for Germany, France, and the

¹⁹ In this paper we do not elaborate a “constituency agreement” for the euro area constituency. We explicitly do not address issues such as procedures for decision preparation, reporting, etc. Also, we do not make any suggestions on distributing the chair or other posts within the constituency, although we are well aware that this will be a major issue/obstacle in forming a euro area constituency. Dealing with these primarily political questions is beyond the scope of this paper.

United Kingdom, and three multi-country constituencies). Under this proposal, the total number of constituencies would only be reduced by one, from 24 to 23.

We, however, follow suggestions made by Eurodad (2006), Truman (2006), Bird and Rowlands (2006) and Ahearne and Eichengreen (2007), among others, and establish two EU constituencies, a euro area EU constituency (EAC), which consists of the 16 EU Member States that form the euro area, and a non-euro area EU constituency (NonEAC), which comprises the 11 remaining Member States that have not yet adopted the euro. Apart from necessary changes implied by the withdrawal of EU Member States from their current constituencies, we aim at keeping the current constituency structure unchanged to the highest extent deemed appropriate.

Under our approach, the five countries with the highest calculated quotas that are entitled to appoint an Executive Director are the U.S.A., Japan, China, Saudi Arabia and Canada, with the latter three countries replacing Germany, France and the United Kingdom as they move to the two new EU constituencies.

In the current structure of the Executive Board, three countries (China, Saudi Arabia and Russia) are considered large enough to elect an Executive Director. On the basis of the

size of the quota we replace China and Saudi Arabia, which are now among the five countries that may elect an Executive Director, with India and Brazil. Russia remains the third single-country constituency. Moreover, we reduce the size of the Executive Board from 24 to 20 seats, acting on a proposal that has often been put forward as one way to increase efficiency in IMF decision-making.

As a result of our proposed Board composition, a number of countries have to change constituency. First, we regroup these countries geographically and, second, make an effort to balance the size of the constituencies in terms of voting shares. For technical purposes, the chairs of the constituencies are allotted to the countries with the highest calculated quota within the constituency. This purely technical assumption only serves the envisaged consolidation of EU Member States and is not intended to propose a new country-specific structure of the Executive Board.²⁰

However, though this is not the main focus of this paper, we also pay due attention to the current discussion on increasing the representation of emerging market economies and developing countries at the IMF.²¹ For instance, according to the G-20 (2009),²² as one of the most recent contributions, “... *emerging and developing economies, including the poorest, should have greater voice and representation and the next review of IMF quotas should be concluded by*

²⁰ As already mentioned earlier, the formation of constituencies is at the discretion of IMF member countries and not subject to any provisions of the Articles of Agreement.

²¹ The efforts of emerging market economies to gain a higher share in IMF decision-making are also fuelled by a shift of quotas that was largely felt inadequate by many emerging market economies in 2008. In spring 2008 the IMF changed the quota formula and adopted a new quota formula, which entailed a shift in calculated quotas of 1.8% from “advanced economies” to “emerging market and developing countries.” This was well below the expectations of many emerging market economies, which would rather have seen a shift of around 4%. In sum, the total of quotas was increased by 11.5%, and 54 countries received an increase in their quota shares on an ad hoc basis. The ad hoc quota increase for these countries amounted to a shift of total quota shares of 1.1% and voting shares of 2.7% from “advanced economies” to “emerging market and developing countries.”

²² G-20 Communiqué Meeting of Finance Ministers and Central Bank Governors, United Kingdom, March 14, 2009.

January 2011 ...” Accordingly, in their official Statement which was prepared in addition to the aforementioned G-20 document, the BRIC countries (Brazil, China, Russia and India) called for

... urgent action with regard to voice and representation in the IMF, in order that they better reflect their real economic weights. In the Fund, a significant realignment of quota should be complemented not later than January 2011. This is necessary to enable members more equitable and fuller participation in the Fund’s efforts to play its mandate role. A rebalancing of representation on the Executive Board and DVIFC would lead

to a more equitable representation on the membership ...²³

For illustrative purposes, table 2 shows the current and the proposed composition of the Executive Board, regrouping the chairs of the constituencies into advanced countries, emerging market economies and developing countries. We present figures (in absolute values and percentage shares) of the current number of chairs, calculated quotas (on the basis of the new quota formula) and voting shares. It should be noted that the proposed composition leads to a loss of (nominal) influence of the advanced economies and a strong increase (31%)

Table 2

IMF Executive Board: Current and Proposed Composition

	Executive Board chairs		Calculated quotas ¹		Votes	
	number	%	absolute	%	absolute	%
<i>Current composition</i>						
Advanced economies	12	50.0	160,190.0	67.4	1,655,150.0	65.8
Emerging market economies	8	33.3	56,513.2	23.8	601,132.0	23.9
Developing countries	4	16.7	21,125.1	8.9	258,501.0	10.3
Total	24	100.0	237,828.3	100.0	2,514,783.0	100.0
<i>Memorandum:</i>						
U.S.A.	1	4.2	42,122.4	17.7	421,974.0	16.8
EU (euro area)	6	25.0	55,125.5	23.2	563,255.0	22.4
EU (non-euro area)	2	8.3	20,844.7	8.8	216,697.0	8.6
<i>Proposed composition</i>						
Advanced economies	8	40.0	162,961.6	68.5	1,587,929.0	63.1
Emerging market economies	10	50.0	66,614.7	28.0	793,387.0	31.5
Developing countries	2	10.0	8,252.0	3.5	133,468.0	5.3
Total	20	100.0	237,828.3	100.0	2,514,784.0	100.0
<i>Memorandum:</i>						
U.S.A.	1	5.0	42,122.4	17.7	421,974.0	16.8
EU (euro area)	1	5.0	55,125.5	23.2	421,974.0	16.8
EU (non-euro area)	1	5.0	20,844.7	8.8	224,546.0	8.9

Source: Authors’ calculations.

Note: differences may be due to rounding.

¹ Based on the new quota formula adopted in April 2008, which is currently being ratified.

²³ See G-20 Information Centre, *Statement of the Finance Ministers of Brazil, China, Russia and India, March 14, 2009*. It is evident that emerging market economies are striving for more influence in the G-20 and the IMF. However, it is still a matter of fact that major decisions at the IMF are prepared by the G-7 countries.

of voting shares for the emerging market economies, which would then hold half of the chairs at the Executive Board.

4 Empirical Results

4.1 Voting Power Distribution within Constituencies

As mentioned above, in the past IMF Member States frequently changed constituencies for various reasons, e.g. greater influence in the constituency or the division of posts. Likewise, the formation of two EU constituencies leads to significant intra-constituency changes for all of the 27 EU Member States, in particular for EU Member States that currently have a chair/alternate chair in the Executive Board²⁴ or dominate their constituencies in terms of relative voting share.

In table 3 we display the hypothetical relative voting shares of all 27 EU Member States in the *current* constituency and the *proposed* constituency structure with two EU constituencies, the euro area EU constituency (EU EAC) and the non-euro area EU constituency (EU nonEAC).

The voting shares in the respective *current* constituencies are based on relative *IMF voting shares*. In the respective *proposed* constituencies, assumed relative voting shares are based on either *IMF voting shares* or *EU Council voting shares* following the Treaty of Nice. By comparison with our benchmark scenario (respective current constituency structure, intra-constituency decision rule: *IMF voting shares*) all EU Member States have a significantly lower relative voting share in the proposed two EU constituencies). The loss in relative voting shares is most pronounced for Germany, France, Italy, the Netherlands,

Belgium, Spain, U.K., Sweden and Denmark. These mostly large EU Member States lose even more relative voting share if the intra-constituency decision rule is based on *EU Council voting shares* rather than *IMF voting shares*.

In our voting power analysis – applying the Shapley-Shubik index – we differentiate between intra-constituency majority thresholds of 50%, 70% and 85%. Again, our benchmark scenario is the individual *current* constituency structure where we assume that intra-constituency decision-making is based on IMF voting shares. Most of the 27 EU Member States lose relative voting power in the proposed two constituencies. The only EU Member States that gain voting power are Ireland, Greece and Portugal in the EU EAC at majority thresholds of 50% and 70%, and Poland (50%) and Lithuania, Latvia and Estonia (all at 85%) in the EU nonEAC. These Member States have virtually no voting power at all in their current constituencies at the respective majority thresholds. It is also worth mentioning that when comparing the decision rule (*IMF* versus *EU Council voting shares*) in the *proposed* constituency structure, the larger EU Member States lose more relative voting power than the smaller EU Member States when *EU Council voting shares* are used. The reason is mainly the above described difference in voting shares.

To sum up, from the perspective of individual EU Member States (posts in the constituency, relative voting shares and voting power) with assumed pure national interest there are actually no incentives to consolidate EU representation at the IMF. However, this tentative conclusion does not preclude the possibility that – after having consoli-

²⁴ Germany, France, U.K., Italy, Greece, the Netherlands, Belgium, Austria, Sweden, Spain and Ireland.

Table 3

IMF Constituencies - Individual “Shapley-Shubik” Voting Power within the Constituency

%

	Current constituencies – decision rule within the constituency based on IMF voting shares				Proposed constituencies – decision rule within the constituency based on IMF voting shares				Proposed constituencies – decision rule within the constituency based on EU Council voting shares	
	relative voting shares	voting power			relative voting shares	voting power			relative voting shares	voting power
		majority threshold				majority threshold				
	50	70	85		50	70	85		73.9	
EU (euro area)										
Germany	100.00	100.000	100.000	100.000	25.99	29.957	28.914	24.594	13.88	14.94
France	100.00	100.000	100.000	100.000	19.20	19.032	19.641	24.594	13.88	14.94
Italy	74.13	100.000	100.000	64.286	14.13	14.073	12.700	16.426	13.88	14.94
Netherlands	45.96	69.788	54.873	30.930	9.30	8.441	8.803	7.859	6.22	5.91
Belgium	36.28	48.730	47.421	26.825	8.31	7.569	7.850	6.939	5.74	5.24
Spain	34.92	33.333	44.881	33.333	7.28	6.692	6.937	6.209	12.92	14.12
Austria	16.97	13.016	15.278	26.825	3.89	3.554	3.821	3.272	4.78	4.29
Finland	15.62	4.048	15.119	25.000	2.38	2.110	2.280	1.881	3.35	2.92
Ireland	14.67	0.000	0.000	41.667	1.96	2.110	2.259	1.875	3.35	2.92
Greece	10.96	0.000	0.000	17.619	2.37	1.845	2.057	1.751	5.74	5.24
Portugal	10.29	0.000	0.000	14.286	2.09	1.748	1.963	1.681	5.74	5.24
Slovak Republic	3.90	3.095	2.937	4.008	0.89	0.803	0.781	1.046	3.35	2.92
Luxembourg	3.83	3.095	2.937	4.008	0.62	0.803	0.751	1.027	1.91	1.74
Slovenia	2.71	3.095	2.937	0.833	0.41	0.564	0.545	0.447	1.91	1.74
Cyprus	2.05	1.507	1.548	2.474	0.31	0.380	0.391	0.227	1.91	1.74
Malta	1.65	0.000	0.000	0.952	0.88	0.324	0.310	0.173	1.44	1.19
EU (non-euro area)										
United Kingdom	100.00	100.000	100.000	100.000	49.90	81.818	58.658	32.709	21.32	24.40
Sweden	28.82	37.381	34.167	25.000	11.40	1.818	10.364	17.312	7.35	7.30
Denmark	22.94	25.000	18.214	25.000	9.07	1.818	7.745	11.955	5.15	4.52
Poland	25.46	0.000	30.357	39.643	8.14	1.818	6.476	10.090	19.85	21.90
Hungary	8.63	6.270	6.349	8.373	5.14	1.818	4.015	6.678	8.82	8.33
Romania	9.70	4.538	8.269	11.789	5.10	1.818	4.015	6.678	10.29	9.44
Czech Republic	8.35	6.270	6.349	7.183	4.97	1.818	3.936	6.558	8.82	8.33
Bulgaria	6.28	4.538	5.116	7.896	3.30	1.818	2.349	3.582	7.35	7.30
Lithuania	3.02	2.143	4.643	0.000	1.19	1.818	0.999	1.836	5.15	4.52
Latvia	2.53	2.143	3.214	0.000	1.00	1.818	0.841	1.717	2.94	1.98
Estonia	1.97	2.143	3.214	0.000	0.78	1.818	0.603	0.884	2.94	1.98

Source: Authors' calculations.

¹ For euro area EU Member States equivalent to 154 out of 209 votes; for non-euro EU Member States equivalent to 101 out of 136 votes.

dated their representation – EU Member States would gain voting power at the Executive Board and the Board of Governors and hence profit from an (all the more important) EU perspective.

4.2 Voting Power Distribution at the Executive Board

In this section we analyze the voting power distribution of the 24 constitu-

encies at the Executive Board in the *current* composition (table 4) and in the *proposed* composition with 20 constituencies (table 5). We differentiate between majority thresholds of 50%, 70% and 85% and calculate the PBI and the SSI. In table 6 we compare the relative gain/loss in voting power of the 27 EU Member States when changing the constituency structure of the

Table 4

IMF Executive Board – Current Composition Voting Shares and Voting Power

Constituency/ chair	Number of member countries	Voting share (%) ¹	Voting power (%)					
			majority threshold					
			50		70		85	
			Penrose- Banzhaf	Shapley- Shubik	Penrose- Banzhaf	Shapley- Shubik	Penrose- Banzhaf	Shapley- Shubik
U.S.A.	1	16.78	20.93	18.55	11.02	19.24	6.33	19.51
Japan	1	6.24	5.95	6.25	6.55	6.22	5.76	6.27
Germany	1	5.82	5.54	5.80	6.14	5.77	5.60	5.81
France	1	4.30	4.09	4.21	4.60	4.20	4.76	4.17
United Kingdom	1	4.30	4.09	4.21	4.60	4.20	4.76	4.17
Belgium	10	5.13	4.88	5.08	5.45	5.04	5.28	5.08
Netherlands	13	4.53	4.30	4.44	4.83	4.42	4.94	4.47
Spain	8	4.67	4.44	4.59	4.98	4.58	5.01	4.57
Italy	7	4.27	4.06	4.18	4.56	4.17	4.74	4.14
China	1	3.82	3.63	3.72	4.10	3.70	4.39	3.67
Canada	12	3.61	3.43	3.52	3.87	3.49	4.21	3.45
Indonesia	13	3.94	3.75	3.85	4.23	3.83	4.49	3.79
Korea	13	3.47	3.29	3.37	3.73	3.35	4.08	3.32
Sweden	8	3.41	3.23	3.30	3.66	3.29	4.03	3.28
Egypt	13	3.23	3.07	3.13	3.47	3.11	3.86	3.08
Saudi Arabia	1	2.81	2.67	2.71	3.02	2.69	3.44	2.66
Sierra Leone	20	3.12	2.96	3.02	3.36	3.01	3.76	2.98
Switzerland	8	2.75	2.61	2.65	2.97	2.64	3.37	2.59
Russia	1	2.39	2.27	2.30	2.58	2.28	2.99	2.25
Iran	7	2.27	2.15	2.17	2.45	2.16	2.86	2.15
Brazil	9	2.81	2.67	2.71	3.03	2.70	3.44	2.67
India	4	2.81	2.67	2.71	3.03	2.70	3.44	2.67
Argentina	6	1.84	1.75	1.75	2.00	1.74	2.36	1.74
Rwanda	23	1.66	1.57	1.57	1.79	1.57	2.11	1.53

Source: Authors' calculations.

¹ Based on the new quota formula adopted in April 2008, which is currently being ratified.

Executive Board to the *proposed* composition.

Table 4 presents the voting power of all 24 constituencies under the current constituency structure; the voting shares are based on the new quota formula. With reference to the frequently mentioned dominance of the U.S.A. our results confirm the evidence in the literature (Bini Smaghi, 2006b; and Leech, 2002a) that the voting power of the U.S.A. is higher than its (nominal) voting share at a majority threshold of

50%. By contrast, the voting power of all other 23 constituencies is below their nominal voting shares. This result holds for both indices.²⁵

At majority thresholds of 70% and 85%, the results depend on the index used. When using the PBI, the U.S.A. loses and the other constituencies gain voting power, whereas when the SSI is applied, the U.S.A. gains and the other constituencies lose voting power as compared with their nominal voting share.²⁶

²⁵ The only exception is Japan, which slightly gains voting power under the SSI.

²⁶ With the exception of Japan at a majority threshold of 85%.

It is interesting to note that the difference in voting power becomes even more pronounced the higher the majority threshold. These findings provide new insights: Bini Smaghi (2006b) and Leech (2002a) do not include the SSI in their analysis; they draw their conclusions only from calculations with the PBI. Leech (2002a), for instance, concludes that a majority threshold of 85% tends to balance voting power to a large extent, which is – as already pointed out – in contradiction to calculations based on the SSI.

Table 5 displays the voting power results of the proposed constituency structure (two EU constituencies, reduced number of constituencies). As pointed out before, any consolidated

voting share of EU Member States which exceeds the voting share of the U.S. constituency (USC) does not seem to be politically feasible. Hence, we distribute the difference between the votes (in absolute numbers) of the EU EAC and the USC to the remaining constituencies in a uniform way. As a result, the EU EAC and USC have an equal voting share of 16.78% of total IMF votes. Note that under this redistribution schedule constituencies with a smaller voting share benefit more than constituencies with a higher share.

At a majority threshold of 50%, the two largest constituencies, the EU EAC and USC, gain voting power relative to their (nominal) voting shares at the expense of all other constituencies. This

Table 5

IMF Executive Board – Proposed Composition Voting Shares and Voting Power

Constituency/ chair	Number of member countries	Voting share (%) ¹	Voting power (%)					
			majority threshold					
			50		70		85	
		Penrose- Banzhaf	Shapley- Shubik	Penrose- Banzhaf	Shapley- Shubik	Penrose- Banzhaf	Shapley- Shubik	
U.S.A.	1	16.78	17.55	18.36	15.34	18.27	8.31	20.76
Japan	1	6.56	6.43	6.36	6.83	6.37	7.34	6.14
China	1	4.13	3.98	3.91	4.26	3.99	5.38	3.47
Saudi Arabia	1	3.12	3.02	2.93	3.23	2.93	4.22	2.64
Canada	1	2.87	2.79	2.70	2.98	2.71	3.89	2.44
India	1	2.66	2.58	2.49	2.77	2.49	3.60	2.25
Russia	1	2.71	2.63	2.54	2.82	2.53	3.68	2.30
Brazil	1	2.03	2.01	1.94	2.17	1.95	2.66	1.63
EU (euro area)	16	16.78	17.55	18.36	15.34	18.27	8.31	20.76
EU (non-euro area)	11	8.93	9.17	8.89	9.63	8.76	8.05	9.31
Norway	16	3.88	3.75	3.67	4.01	3.71	5.15	3.31
Mexico	7	3.35	3.23	3.14	3.48	3.19	4.49	2.82
Colombia	20	2.23	2.18	2.10	2.35	2.09	2.96	1.81
Indonesia	13	4.26	4.09	4.03	4.38	4.10	5.52	3.57
Australia	14	3.81	3.68	3.60	3.94	3.65	5.06	3.23
Kuwait	13	3.54	3.42	3.33	3.66	3.35	4.75	3.04
South Africa	20	3.43	3.31	3.23	3.56	3.26	4.61	2.94
Switzerland	10	3.53	3.41	3.32	3.65	3.34	4.72	3.02
Argentina	7	2.33	2.27	2.19	2.44	2.17	3.14	1.93
Algeria	27	3.08	2.98	2.90	3.19	2.88	4.18	2.62

Source: Authors' calculations.

¹ Based on the new quota formula adopted in April 2008, which is currently being ratified.

result holds for both the PBI and the SSI.²⁷ This finding is in line with the results of table 4, where the U.S. gains voting power under the *current* composition of the Executive Board.

Under majority thresholds of 70% and 85%, the EU EAC and USC lose and all other constituencies gain voting power when the calculations are carried out with the PBI. These results are in line with Bini Smaghi (2006b). However, when applying the SSI, a completely different picture arises, which mirrors the SSI results at a majority threshold of 50%: The USC and EAC still gain, whereas all other constituencies lose voting power.²⁸ As already observed in the results of the *current* constituency, the difference between the PBI and SSI values widens the higher the majority thresholds are. When applying the SSI, the EU EAC and USC – as compared with their voting share – gain even more voting power under the 85% majority threshold scenario than under the 50% scenario.

Another interesting aspect is to compare the voting power of those *current* single-chair constituencies that retain their status in the *proposed* composition of the Executive Board (U.S.A., Japan, China, Saudi Arabia and Russia). Note, however that the PBI has to be replaced by the PI, which measures absolute voting power. The PBI can only be used to compare the voting powers of several voters under the same voting rule (because of the normalization, which depends on the voting game). The SSI is still a valid concept here; it can be used to compare voting power independently of the voting rule, since

it is a probability of power and, hence, already measures absolute voting power. The calculations of the PI (not included in the tables) show that regardless of the majority threshold all five single-chair constituencies (U.S.A., Japan, China, Saudi Arabia and Russia) gain voting power.²⁹ A mixed picture arises if the SSI is taken for comparison.

In view of the differences in the results of the PBI (PI) and the SSI, the question arises as to which index should be used to measure voting power. Felsenthal and Machover (1998) note that in general the Shapley-Shubik and (normalized) Penrose-Banzhaf indices behave quite differently, although their values are often fairly similar. With the exception of Leech and Leech (2002b), the question of whether the PBI or the SSI is more adequate is not explicitly dealt with in the empirical literature, which therefore gives little guidance in this respect. Hence, where both indices are calculated, the results are presented without explicit comments on the differences. Leech (2002a), Leech and Leech (2005) build their analyses on the PBI and justify their preferences on the basis of Coleman (1971) and the empirical findings in Leech (2002b). Paterson (2006), however, presents convincing arguments in favor of the SSI.

In charts 1, 2 and 3 we plot the differences between the two indices. Chart 1 shows that the PBI of the two large equal constituencies (EU EAC and USC) remains constant until a majority threshold of 60% is reached. The PBI then starts to decline and gradually approaches the value of 5, which is the value for a unanimity rule ($1/n$), where

²⁷ The only exception is the EU nonEAC, which slightly gains under the PBI.

²⁸ The only exception here is the EU nonEAC, which loses voting power under the PBI and gains under the SSI at a majority threshold of 85%.

²⁹ U.S.A., Japan and China are an exception at a majority threshold of 50%.

Chart 1

Penrose-Banzhaf Voting Power as a Function of the Majority Threshold

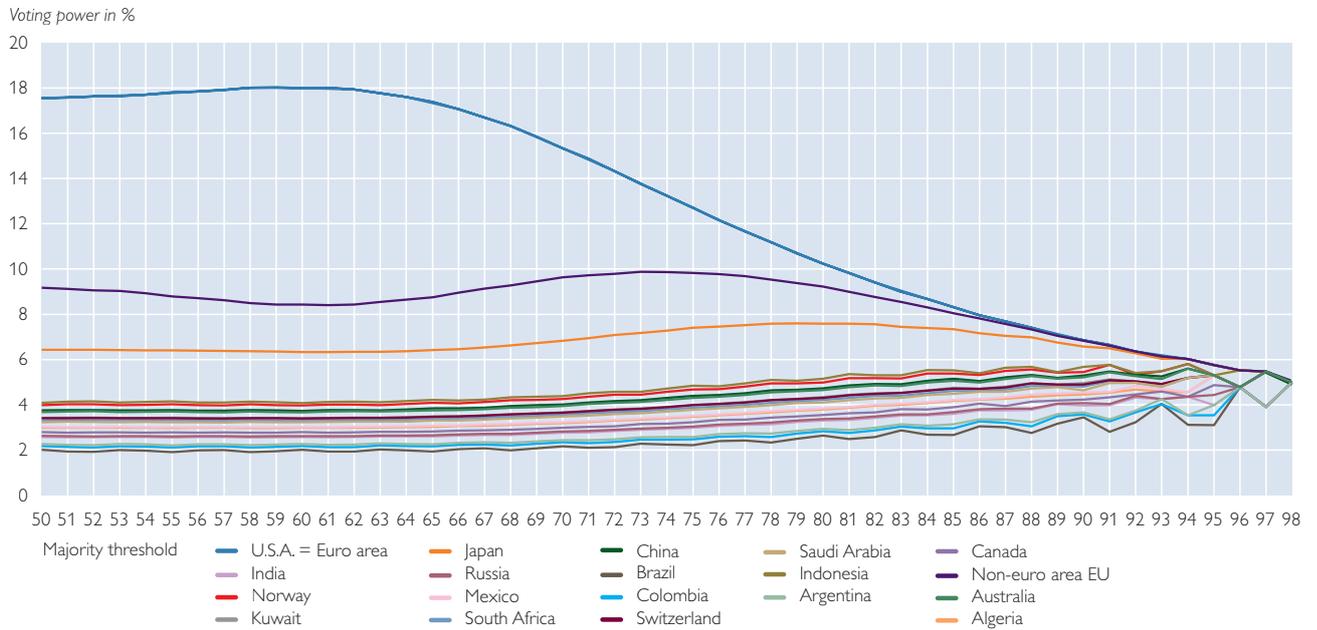
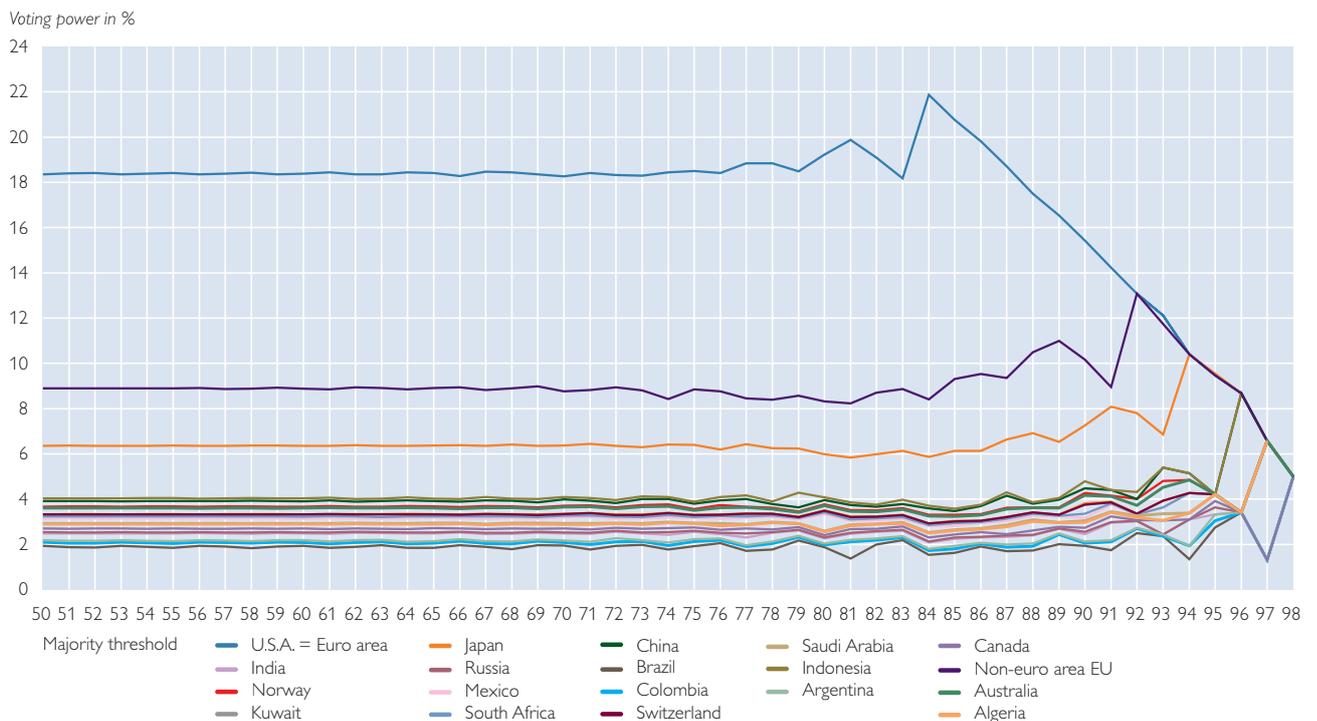
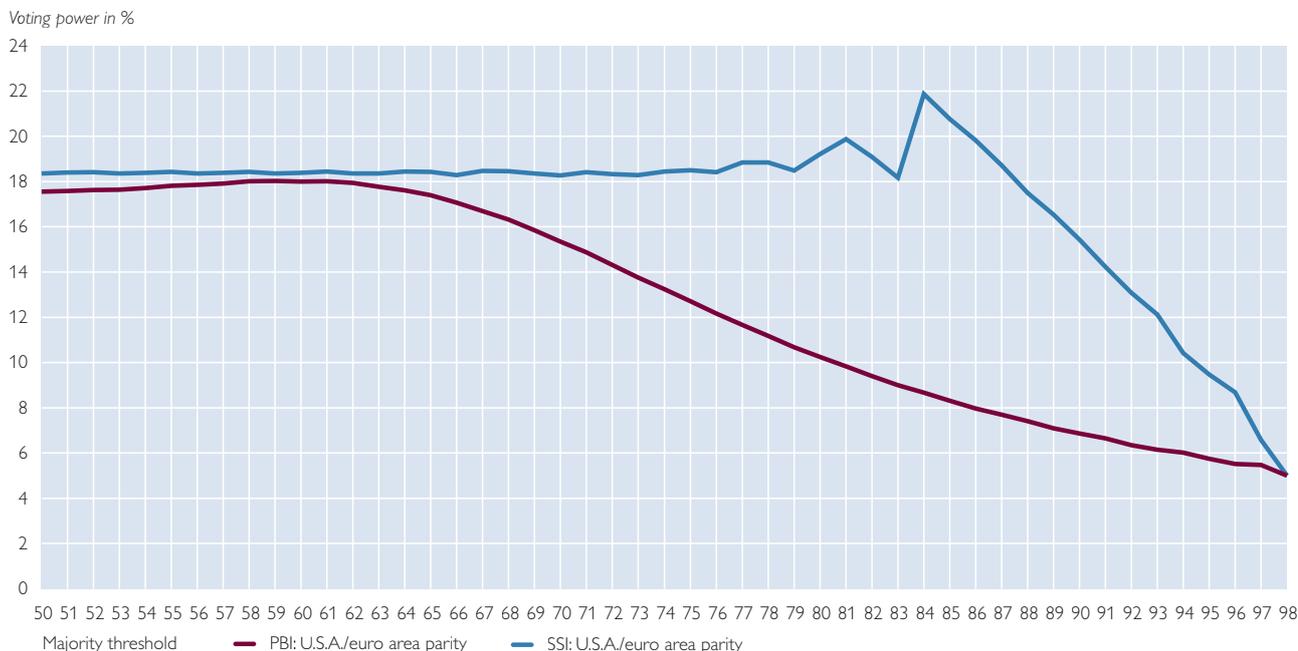


Chart 2

Shapley-Shubik Voting Power as a Function of the Majority Threshold



Penrose-Banzhaf vs. Shapley-Shubik Voting Power as a Function of the Majority Threshold



Source: Authors' calculations.

all constituencies have equal voting power. It is interesting to note that at an 85% majority threshold, the voting power of the EU EAC and the USC is just slightly above 8%. Based on these PBI-based results, Leech (2002a, p. 394) calculates that in order to equalize voting power to the (former U.S.) voting share of 17.55%, the voting share of the USC and the EU EAC would have to be raised to 67.45%, and the share of all other constituencies would have to be reduced substantially.

The SSI (chart 2) shows a different picture: The voting power of the EU EAC and USC remains constant at approximately 18% until a majority threshold of 84% is reached, then jumps to 22% and falls sharply to 5% (unanimity). Put differently, both constituencies have a fairly constant voting power for majority thresholds between 50% and 85%, which is marginally above their voting share. The respec-

tive voting power of the other 18 constituencies shows the opposite behavior to that of the EU EAC and USC.

The difference in the behavior of the PBI and SSI for the EU EAC (identical with USC under voting share parity) is explicitly displayed in chart 3. When calculating the SSI, the voting power is fairly constant between majority thresholds of 50% and 85%, whereas for the PBI, the voting power starts to increase already at fairly low threshold levels. In other words, for majority thresholds above 67% (including the special IMF majorities of 70% and 85%), under the PBI the two large constituencies have less voting power and the other constituencies more voting power than their voting share indicates. In contrast, however, under the SSI, the two large constituencies still have more voting power than voting shares and the other constituencies less voting power than voting shares.

Given the empirical plausibility and taking theoretical considerations (Paterson, 2006) into account, we prefer the SSI and hence favor the voting power results based on the SSI.

In a next step (table 6), we analyze the voting power changes (SSI only) for EU Member States on the Executive Board level for various thresholds when changing the constituency structure of the Executive Board to the *proposed* composition. We assume that decision-making within the EU EAC and EU nonEAC is based on IMF voting shares.

At majority thresholds of 50% and 70%, in the EU EAC larger EU Member States lose and smaller EU Member States gain voting power. In the EU nonEAC, the evidence is mixed and less clear-cut. At a majority threshold of 80% the picture changes; in the EU EAC, larger EU Member States gain and smaller EU Member States lose voting power. In the EU nonEAC, EU Member States mostly gain voting power.

To sum up the results of our voting power analysis on the Executive Board

Table 6

**IMF Executive Board (EB) - Individual “Shapley-Shubik” Voting Power
Decision Rule within Constituency Based on IMF Voting Shares**

	EB – current composition			EB – proposed composition ¹			Relative gain / loss in power		
	majority threshold			majority threshold			majority threshold		
	50	70	85	50	70	85	50	70	85
	%								
EU (euro area)									
Germany	5.802	5.769	5.806	5.501	5.282	5.106	-5.2	-8.4	-12.0
France	4.213	4.201	4.174	3.495	3.588	5.106	-17.0	-14.6	22.3
Italy	4.180	4.166	2.661	2.584	2.320	3.410	-38.2	-44.3	28.2
Netherlands	3.101	2.425	1.382	1.550	1.608	1.632	-50.0	-33.7	18.0
Belgium	2.473	2.389	1.362	1.390	1.434	1.441	-43.8	-40.0	5.8
Spain	1.530	2.054	1.523	1.229	1.267	1.289	-19.7	-38.3	-15.4
Austria	0.661	0.770	1.362	0.653	0.698	0.679	-1.2	-9.3	-50.1
Finland	0.134	0.497	0.819	0.387	0.416	0.390	189.6	-16.2	-52.3
Ireland	0.000	0.000	1.436	0.387	0.413	0.389	+ ∞	+ ∞	-77.4
Greece	0.000	0.000	0.729	0.339	0.376	0.364	+ ∞	+ ∞	-50.2
Portugal	0.000	0.000	0.591	0.321	0.359	0.349	+ ∞	+ ∞	-41.0
Slovak Republic	0.157	0.148	0.203	0.147	0.143	0.217	-6.1	-3.6	6.7
Luxembourg	0.157	0.148	0.203	0.147	0.137	0.213	-6.1	-7.3	4.8
Slovenia	0.157	0.148	0.042	0.104	0.100	0.093	-34.0	-32.7	119.5
Cyprus	0.067	0.068	0.111	0.070	0.072	0.047	4.1	4.5	-57.4
Malta	0.000	0.000	0.039	0.060	0.057	0.036	+ ∞	+ ∞	-8.7
EU (non-euro area)									
United Kingdom	4.213	4.201	4.174	7.274	5.138	3.044	72.7	22.3	-27.1
Sweden	1.235	1.123	0.819	0.162	0.908	1.611	-86.9	-19.1	96.8
Denmark	0.826	0.599	0.819	0.162	0.678	1.113	-80.4	13.4	35.9
Poland	0.000	0.803	1.028	0.162	0.567	0.939	+ ∞	-29.3	-8.6
Hungary	0.318	0.320	0.425	0.162	0.352	0.621	-49.2	10.0	46.2
Romania	0.202	0.365	0.527	0.162	0.352	0.621	-19.8	-3.7	17.9
Czech Republic	0.318	0.320	0.365	0.162	0.345	0.610	-49.2	7.8	67.4
Bulgaria	0.202	0.226	0.353	0.162	0.206	0.333	-19.8	-9.0	-5.5
Lithuania	0.071	0.153	0.000	0.162	0.088	0.171	128.3	-42.6	+ ∞
Latvia	0.071	0.106	0.000	0.162	0.074	0.160	128.3	-30.3	+ ∞
Estonia	0.071	0.106	0.000	0.162	0.053	0.082	128.3	-50.0	+ ∞

Source: Authors' calculations.

¹ Number of votes: U.S. constituency equals euro area constituency.

level, we point out that in the *proposed* composition of the Executive Board, the EU EAC and the USC both have the same voting share (16.78%) and both have a consistently higher voting power than voting share at all three majority thresholds. The EU nonEAC is the third-largest constituency with a voting share of 8.93%; its voting power is slightly below its voting share at majority thresholds of 50% and 70% and exceeds the voting share at a majority threshold of 85%. All other constituencies have less voting power than their voting share indicates in the *proposed* composition. This, however, generally corresponds to the *current* composition of the Executive Board, where only the U.S.A. has more voting power than its voting share indicates. Hence, from an EU perspective, it would definitely be in the interest of EU Member States to consolidate their representation at the Executive Board, since even the EU EAC alone would find itself in the same position as presently the U.S.A. and could block major IMF decisions at an 85% majority threshold. Moreover, like the U.S.A., the EU EAC would have a voting power that is well above its voting share. Furthermore, in a common understanding, the EU EAC and the USC would be able to veto 70% majority decisions and if, for instance, a third large country such as Japan were to join the common understanding, the three countries would also be able to determine IMF decisions with a 50% majority rule.

As regards the country specific-analysis, for ordinary decisions, which

are the bulk of IMF decisions, smaller EU EAC Member States could increase their voting power in the *proposed* composition as compared with the *current* composition. Note that these conclusions are based on calculations with the SSI, which is our preferred measure of voting power.

4.3 Voting Power Distribution at the Board of Governors

The changes in voting power at the Board of Governors have been analyzed in the empirical literature on several occasions, e.g. Ahearne et al. (2006a, 2006b) and Leech and Leech (2005). Leech and Leech (2005)³⁰ calculate voting power indices for a group of Euro-12 and EU-25 Member States. Each country's voting power is measured by its two-stage or indirect PI. For decision-making within the group they use various measures, including IMF voting shares with simple majority and the system of qualified majority voting of the Nice Treaty (EU-25). When IMF voting shares are used, all Euro-12 Member States and all EU-25 Member States gain voting power as compared with the status quo. When the EU Council votes are applied, larger EU-25 Member States lose substantially and smaller EU-25 Member States gain voting power. In brief, it is the decision-making system of the Nice Treaty that prevents all EU-25 Member States from gaining voting power at the IMF Board of Governors. Leech and Leech (2005, p. 268) argue that "*the countries that are currently most powerful in the IMF, all lose a lot of power.*"

³⁰ Leech and Leech (2005) and Ahearne et al. (2006a, 2006b) use the "old" quota formula with the current constituency structure of 24 seats. Furthermore, in order to avoid an unrealistic scenario of an EU voting weight in excess of the U.S. weight, they propose to redistribute the "excess" EU voting rights uniformly to all other IMF member countries. Under this "realistic" assumption the nominal total voting power of the EU Member States would be reduced by one-third in comparison with the current situation. Whether EU Member States, however, would be willing to accept such a dramatic cut in voting rights remains to be seen.

Ahearne et al. (2006a, 2000b) use the same voting power measure (PI) as Leech and Leech (2005) and, hence, argue along the same lines. According to their calculations – while decision-making within EU Member States is determined by the EU Council votes – a few larger and all the smaller EU Member States would

benefit from a single EU chair, whereas most of the larger and some medium-sized Member States would lose voting power.

In the following we present the results of our voting power analysis. We apply two different systems of decision-making, current IMF voting shares and the decision rules based on

Table 7

IMF Board of Governors (BoG) – Decision Rule within Group of EU Member States Based on IMF Voting Shares Individual Voting Shares and “Penrose-Banzhaf” Voting Power

	BoG – current composition 184 countries ¹				BoG – proposed composition 169 countries ²			Relative gain / loss in power	
	voting shares	voting power Penrose index			indirect voting power Penrose index			majority threshold	
		majority threshold			majority threshold				
		50	70	85	50	70	85	50	70
	%								
EU (euro area)	22.398								
Germany	5.822	0.162	0.039	0.000	0.303	0.062	0.000	86.4	56.8
France	4.300	0.122	0.031	0.000	0.185	0.052	0.000	51.4	66.4
Italy	3.164	0.090	0.023	0.000	0.146	0.034	0.000	61.8	46.7
Netherlands	2.083	0.060	0.016	0.000	0.086	0.022	0.000	43.8	38.3
Belgium	1.861	0.053	0.014	0.000	0.077	0.020	0.000	44.0	41.6
Spain	1.630	0.047	0.012	0.000	0.068	0.017	0.000	46.4	40.8
Austria	0.870	0.025	0.007	0.000	0.039	0.009	0.000	56.8	36.6
Finland	0.532	0.015	0.004	0.000	0.023	0.006	0.000	48.9	39.2
Ireland	0.530	0.015	0.004	0.000	0.023	0.006	0.000	49.5	38.3
Greece	0.468	0.013	0.004	0.000	0.020	0.005	0.000	46.3	39.9
Portugal	0.439	0.013	0.003	0.000	0.019	0.005	0.000	48.1	39.6
Slovak Republic	0.200	0.006	0.002	0.000	0.009	0.002	0.000	49.5	38.7
Luxembourg	0.196	0.006	0.001	0.000	0.009	0.002	0.000	52.2	38.0
Slovenia	0.139	0.004	0.001	0.000	0.006	0.001	0.000	40.1	36.3
Cyprus	0.093	0.003	0.001	0.000	0.004	0.001	0.000	50.9	41.6
Malta	0.070	0.002	0.001	0.000	0.003	0.001	0.000	71.7	36.1
EU (non-euro area)	8.617								
United Kingdom	4.300	0.122	0.031	0.000	0.295	0.095	0.000	141.5	207.7
Sweden	0.982	0.028	0.007	0.000	0.001	0.031	0.000	-98.0	321.0
Denmark	0.782	0.022	0.006	0.000	0.001	0.023	0.000	-97.4	291.7
Poland	0.701	0.020	0.005	0.000	0.001	0.020	0.000	-97.1	275.8
Hungary	0.443	0.013	0.003	0.000	0.001	0.013	0.000	-95.5	277.7
Romania	0.439	0.013	0.003	0.000	0.001	0.013	0.000	-95.4	280.6
Czech Republic	0.428	0.012	0.003	0.000	0.001	0.012	0.000	-95.3	282.1
Bulgaria	0.284	0.008	0.002	0.000	0.001	0.008	0.000	-92.9	250.2
Lithuania	0.103	0.003	0.001	0.000	0.001	0.003	0.000	-80.5	314.7
Latvia	0.086	0.002	0.001	0.000	0.001	0.003	0.000	-76.7	312.2
Estonia	0.067	0.002	0.001	0.000	0.001	0.002	0.000	-70.1	270.8

Source: Authors' calculations.

¹ 186 IMF Member States; excluding Zimbabwe and the Republic of Kosovo.

² Under the assumption that all 27 EU Member States are represented by two “fully-fledged” IMF members; a “euro area EU group” and “a non-euro area EU group.”

Table 8

IMF Board of Governors (BoG) – Decision Rule within Group of EU Member States Based on EU Council Voting Shares Individual Voting Shares and “Penrose-Banzhaf” Voting Power

	BoG – current composition 184 countries ¹				BoG – proposed composition 169 countries ²			Relative gain / loss in power	
	voting shares	voting power Penrose index			indirect voting power Penrose index				
		majority threshold			majority threshold				
		50	70	85	50	70	85	50	70
	%								
EU (euro area)	22.398								
Germany	5.822	0.162	0.039	0.000	0.055	0.021	0.000	-65.9	-45.8
France	4.300	0.122	0.031	0.000	0.055	0.021	0.000	-54.7	-31.4
Italy	3.164	0.090	0.023	0.000	0.055	0.021	0.000	-38.8	-9.3
Netherlands	2.083	0.060	0.016	0.000	0.027	0.010	0.000	-55.2	-34.5
Belgium	1.861	0.053	0.014	0.000	0.024	0.009	0.000	-54.1	-33.1
Spain	1.630	0.047	0.012	0.000	0.052	0.020	0.000	12.3	63.6
Austria	0.870	0.025	0.007	0.000	0.021	0.008	0.000	-16.3	21.4
Finland	0.532	0.015	0.004	0.000	0.014	0.006	0.000	-5.2	37.4
Ireland	0.530	0.015	0.004	0.000	0.014	0.006	0.000	-4.7	38.1
Greece	0.468	0.013	0.004	0.000	0.024	0.009	0.000	82.1	164.0
Portugal	0.439	0.013	0.003	0.000	0.024	0.009	0.000	94.0	181.1
Slovak Republic	0.200	0.006	0.002	0.000	0.014	0.006	0.000	152.6	265.9
Luxembourg	0.196	0.006	0.001	0.000	0.009	0.003	0.000	53.0	121.6
Slovenia	0.139	0.004	0.001	0.000	0.009	0.003	0.000	115.8	212.7
Cyprus	0.093	0.003	0.001	0.000	0.009	0.003	0.000	223.8	369.2
Malta	0.070	0.002	0.001	0.000	0.006	0.002	0.000	186.9	315.3
EU (non-euro area)	8.617								
United Kingdom	4.300	0.122	0.031	0.000	0.057	0.027	0.000	-53.2	-13.5
Sweden	0.982	0.028	0.007	0.000	0.023	0.011	0.000	-20.1	41.5
Denmark	0.782	0.022	0.006	0.000	0.015	0.007	0.000	-33.1	18.4
Poland	0.701	0.020	0.005	0.000	0.055	0.026	0.000	175.3	387.5
Hungary	0.443	0.013	0.003	0.000	0.027	0.013	0.000	113.5	277.7
Romania	0.439	0.013	0.003	0.000	0.031	0.015	0.000	147.1	337.2
Czech Republic	0.428	0.012	0.003	0.000	0.027	0.013	0.000	120.7	290.5
Bulgaria	0.284	0.008	0.002	0.000	0.023	0.011	0.000	175.7	387.7
Lithuania	0.103	0.003	0.001	0.000	0.015	0.007	0.000	407.8	798.4
Latvia	0.086	0.002	0.001	0.000	0.008	0.004	0.000	226.1	477.0
Estonia	0.067	0.002	0.001	0.000	0.008	0.004	0.000	319.1	641.6

Source: Authors' calculations.

¹ 186 IMF Member States, excluding Zimbabwe and the Republic of Kosovo.

² Under the assumption that all 27 EU Member States are represented by two “fully-fledged” IMF members, a “euro area EU group” and “a non-euro area EU group.”

EU Council votes according to the Treaty of Nice.³¹ Algaba et al. (2003) show that the triple-majority decision rules, adopted at the Nice Summit meeting, are almost equivalent to a

simple-majority decision rule with EU Council votes alone. In any case, the required population quota to adopt a decision does not change the voting power of the countries in practice.

³¹ The Nice European Council in December 2000 established two decision rules. The rules are contained in the “Treaty of Nice amending the Treaty on European Union, the Treaties establishing the European Communities and certain related Acts,” in particular in Section 21 “Declaration on the enlargement of the European Union and the Declaration on the qualified majority threshold and the number of votes for a blocking minority in an enlarged Union.” 2001.

Table 9

IMF Board of Governors (BoG) – Decision Rule within Group of EU Member States Based on IMF Voting Shares and “Shapley-Shubik” Voting Power

	BoG – current composition 184 countries ¹			BoG – proposed composition 169 countries ²			Relative gain / loss in power			
	voting power			indirect voting power						
	majority threshold			majority threshold			majority threshold			
	50	70	85	50	70	85	50	70	85	
	%									
EU (euro area)	22.398									
Germany	5.822	5.816	5.816	6.034	5.903	5.673	5.209	1.5	-2.5	-13.7
France	4.300	4.230	4.231	4.326	3.750	3.853	5.209	-11.3	-8.9	20.4
Italy	3.164	3.079	3.079	3.118	2.773	2.492	3.479	-9.9	-19.1	11.6
Netherlands	2.083	2.006	2.006	2.015	1.663	1.727	1.664	-17.1	-13.9	-17.4
Belgium	1.861	1.789	1.789	1.794	1.491	1.540	1.469	-16.6	-13.9	-18.1
Spain	1.630	1.563	1.563	1.565	1.319	1.361	1.315	-15.6	-12.9	-16.0
Austria	0.870	0.829	0.829	0.825	0.700	0.750	0.693	-15.5	-9.6	-16.0
Finland	0.532	0.506	0.506	0.502	0.416	0.447	0.398	-17.8	-11.5	-20.7
Ireland	0.530	0.503	0.503	0.500	0.416	0.443	0.397	-17.4	-11.9	-20.5
Greece	0.468	0.444	0.444	0.441	0.364	0.404	0.371	-18.1	-9.1	-15.9
Portugal	0.439	0.417	0.417	0.414	0.344	0.385	0.356	-17.4	-7.6	-13.9
Slovak Republic	0.200	0.189	0.189	0.188	0.158	0.153	0.221	-16.4	-19.0	18.1
Luxembourg	0.196	0.186	0.186	0.184	0.158	0.147	0.217	-14.9	-20.8	18.1
Slovenia	0.139	0.132	0.132	0.131	0.111	0.107	0.095	-15.6	-18.8	-27.4
Cyprus	0.093	0.088	0.088	0.087	0.075	0.077	0.048	-14.7	-12.4	-44.8
Malta	0.070	0.067	0.067	0.066	0.064	0.061	0.037	-4.1	-8.8	-44.3
EU (non-euro area)	8.617									
United Kingdom	4.300	4.230	4.231	4.326	7.468	5.261	3.247	76.5	24.4	-24.9
Sweden	0.982	0.937	0.937	0.933	0.166	0.930	1.719	-82.3	-0.8	84.2
Denmark	0.782	0.744	0.744	0.741	0.166	0.695	1.187	-77.7	-6.7	60.3
Poland	0.701	0.667	0.667	0.663	0.166	0.581	1.002	-75.1	-12.9	51.0
Hungary	0.443	0.420	0.420	0.417	0.166	0.360	0.663	-60.5	-14.3	59.0
Romania	0.439	0.417	0.417	0.414	0.166	0.360	0.663	-60.2	-13.6	60.2
Czech Republic	0.428	0.406	0.406	0.403	0.166	0.353	0.651	-59.2	-13.1	61.4
Bulgaria	0.284	0.270	0.270	0.267	0.166	0.211	0.356	-38.4	-21.8	33.1
Lithuania	0.103	0.097	0.097	0.097	0.166	0.090	0.182	70.4	-8.0	88.9
Latvia	0.086	0.082	0.082	0.081	0.166	0.075	0.170	103.1	-7.7	110.7
Estonia	0.067	0.064	0.064	0.063	0.166	0.054	0.088	161.4	-14.9	39.5

Source: Authors' calculations.

¹ 186 IMF Member States, excluding Zimbabwe and the Republic of Kosovo.

² Under the assumption that all 27 EU Member States are represented by two “fully-fledged” IMF members, a “euro area EU group” and “a non-euro area EU group.”

We consider three majority thresholds (50%, 70% and 85%) and calculate two different indices (PI (absolute PBI) and SSI). Our analysis, however, differs from the aforementioned papers in one important institutional aspect. We deem a consolidation of all 27 EU Member States in a group of (currently 16) euro area Member States and a group of (presently 11) non-euro area

EU Member States essential to take account of different inner EU interests.

Our results accomplished with the PI mirror the results of Leech and Leech (2005) and Ahearne et al. (2006a, 2006b); the results are displayed without any further comment in tables 7 and 8. We refer to the point made above that we prefer the SSI as the more adequate measure for voting

power changes and hence focus on describing the results achieved with the SSI (tables 9 and 10), which – in part – contradict the PI-based results of the aforementioned papers.

Table 9 shows the voting power results obtained under decision-making within the group of euro area Member States on the basis of IMF voting shares. Our benchmark scenario (*current composition*) is the Board of Governors with a number of 184³² members. The *proposed* composition of the Board of Governors comprises 169 members, the group of euro area Member States and the group of non-euro area Member States being fully-fledged IMF members. Overall, most of the 27 EU Member States lose voting power as compared with the current composition. Non-euro area EU Member States are the only exception worth mentioning; they mostly gain voting power at the 85% majority threshold.

Alternatively, we assume that the decisions within the two groups of EU Member States are determined by EU Council votes (table 10). In this case, the euro area Member States need 154 out of 209 EU Council votes, and the non-euro area EU Member States 101 out of 136 EU Council votes (equivalent to a majority threshold of 73.9%, respectively). As compared with the decision rule based on IMF voting shares, the results differ substantially: At all majority thresholds (50%, 70%, 85%), most of the larger euro area and non-euro area Member States lose, whereas all smaller EU Member States gain voting power.

To briefly sum up the results of the voting power analysis of the Board of Governors, there is clearly no incentive for all 27 EU Member States to consoli-

date their representation at the Board of Governors if decision-making within the group is based on IMF voting shares. In this case, all EU Member States would lose voting power compared with the status quo. If, however, decision-making within the group is based on EU Council votes, in particular smaller EU Member States would gain voting power. Yet this country-specific analysis should not blur the overall perspective that EU Member States would have a greater influence on IMF decision-making if they were to act in a consolidated bloc also in the Board of Governors.

5 Summary and Conclusions

We analyze the consequences of consolidated EU representation at the IMF. The 27 EU Member States are re-grouped into two constituencies, a euro area EU constituency (EU EAC) and a non-euro area EU constituency (EU nonEAC). For reasons of political feasibility, we downsize the voting share of the EU EAC to align it with that of the U.S. constituency (USC). In the voting power analysis we use Penrose-Banzhaf and Shapley-Shubik voting power measures. Our approach should not be taken too literally, given the consensus-oriented decision-making process at the IMF, which is also mirrored in the formal lack of intra-constituency decision rules.

In the empirical literature on IMF voting power analysis, the results concerning the Executive Board are primarily based on the PBI. Our results, which are based on the new quota formula and the EU-27, confirm the PBI-based evidence in the literature, where the voting power of the two large constituencies (USC and EAC)

³² The voting rights of Zimbabwe were suspended effective as of June 6, 2003. The Republic of Kosovo became the 186th member of the IMF on June 29, 2009.

Table 10

IMF Board of Governors (BoG) – Decision Rule within Group of EU Member States Based on EU Council Voting Shares Individual Voting Shares and “Shapley-Shubik” Voting Power

	BoG – current composition 184 countries ¹			BoG – proposed composition 169 countries ²			Relative gain / loss in power			
	voting power			indirect voting power						
	majority threshold			majority threshold			majority threshold			
	50	70	85	50	70	85	50	70	85	
	%									
EU (euro area)	22.398									
Germany	5.822	5.816	5.816	6.034	2.943	2.930	3.163	-49.4	-49.6	-47.6
France	4.300	4.230	4.231	4.326	2.943	2.930	3.163	-30.4	-30.7	-26.9
Italy	3.164	3.079	3.079	3.118	2.943	2.930	3.163	-4.4	-4.8	1.5
Netherlands	2.083	2.006	2.006	2.015	1.165	1.160	1.253	-41.9	-42.2	-37.8
Belgium	1.861	1.789	1.789	1.794	1.033	1.028	1.110	-42.3	-42.5	-38.1
Spain	1.630	1.563	1.563	1.565	2.782	2.770	2.990	78.0	77.2	91.1
Austria	0.870	0.829	0.829	0.825	0.846	0.842	0.909	2.0	1.6	10.1
Finland	0.532	0.506	0.506	0.502	0.575	0.572	0.618	13.7	13.2	23.0
Ireland	0.530	0.503	0.503	0.500	0.575	0.572	0.618	14.2	13.7	23.6
Greece	0.468	0.444	0.444	0.441	1.033	1.028	1.110	132.4	131.5	151.7
Portugal	0.439	0.417	0.417	0.414	1.033	1.028	1.110	147.7	146.6	168.2
Slovak Republic	0.200	0.189	0.189	0.188	0.575	0.572	0.618	203.8	202.5	229.5
Luxembourg	0.196	0.186	0.186	0.184	0.342	0.341	0.368	84.1	83.3	99.7
Slovenia	0.139	0.132	0.132	0.131	0.342	0.341	0.368	159.8	158.7	181.8
Cyprus	0.093	0.088	0.088	0.087	0.342	0.341	0.368	290.2	288.5	323.2
Malta	0.070	0.067	0.067	0.066	0.234	0.233	0.252	251.6	250.1	281.9
EU (non-euro area)	8.617									
United Kingdom	4.300	4.230	4.231	4.326	1.765	1.734	1.920	-58.3	-59.0	-55.6
Sweden	0.982	0.937	0.937	0.933	0.695	0.683	0.756	-25.8	-27.1	-19.0
Denmark	0.782	0.744	0.744	0.741	0.464	0.455	0.504	-37.7	-38.8	-31.9
Poland	0.701	0.667	0.667	0.663	1.712	1.682	1.861	156.6	152.1	180.7
Hungary	0.443	0.420	0.420	0.417	0.838	0.823	0.911	99.5	96.0	118.6
Romania	0.439	0.417	0.417	0.414	0.963	0.946	1.047	130.9	126.8	153.0
Czech Republic	0.428	0.406	0.406	0.403	0.838	0.823	0.911	106.2	102.6	125.9
Bulgaria	0.284	0.270	0.270	0.267	0.695	0.683	0.756	158.0	153.5	183.0
Lithuania	0.103	0.097	0.097	0.097	0.464	0.455	0.504	375.9	367.6	422.4
Latvia	0.086	0.082	0.082	0.081	0.250	0.245	0.271	205.5	200.1	235.5
Estonia	0.067	0.064	0.064	0.063	0.250	0.245	0.271	293.0	286.1	331.5

Source: Authors' calculations.

¹ 186 IMF Member States, excluding Zimbabwe and the Republic of Kosovo.

² Under the assumption that all 27 EU Member States are represented by two “fully-fledged” IMF members, a “euro area EU group” and “a non-euro area EU group.”

exceeds the corresponding voting shares. The other smaller constituencies, by contrast, have a voting power that is below their voting shares. For majority thresholds higher than 67%, the PBI and the SSI increasingly diverge. The difference is most pronounced at the qualified majority threshold of 85%, where the PBI has already plunged dramatically whereas the SSI remains more or less constant.

For theoretical reasons and reasons of empirical plausibility, we favor the SSI.

The voting power results concerning the Board of Governors depend both on decision rules among EU Member States and the power measure used. Under the PBI, our results confirm the evidence in the empirical PBI-based literature. However, applying the SSI produces quite a different picture. With this preferred voting power mea-

sure, if decision-making within the group is based on IMF voting shares virtually none of the 27 EU Member States has an incentive to consolidate EU representation at the Board of Governors. In this case all EU Member States would lose voting power as compared with the status quo. If, however, decision-making within the group is based on EU Council votes, in particular smaller EU Member States would gain voting power and hence have an incentive to push EU consolidation. By contrast, most of the larger EU Member States tend to lose voting power and might consequently be inclined to retain the status quo. This country-specific analysis, however, should not conceal the overall perspective that – in accordance with the analysis of the Executive Board – EU Member States would have a greater influence on IMF decision-making if they act in a consolidated bloc at the Board of Governors.

With a consolidated representation the euro area would be able to act as a second global player at the IMF, disposing of veto capabilities like the U.S.A.

The euro area voting power would also exceed its voting share even if its voting share were reduced to the voting share of the U.S.A. In particular, by bundling individual euro area concerns, a consolidated euro area representation would act as a booster for the euro area as a whole. A consolidation is more important than ever, since all constituencies involving EU (euro area and non-euro area) Member States currently have a voting power below their voting shares. Furthermore, because of the “mixed constituency” structure, the influence of EU (euro area and non-euro area) Member States on intraconstituency decision-making is heterogeneous, in some cases slight.

However, whether individual EU (euro area and non-euro area) Member States are willing to join a common IMF representation crucially depends on the (future) design of the decision-making process within EU constituencies. In this context, it could also become relevant to address the issue of veto power. This topic, however, is left to further research.

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Notes

Abbreviations

A-SIT	Secure Information Technology Center – Austria	IHS	Institut für Höhere Studien und Wissenschaftliche Forschung – Institute for Advanced Studies, Vienna
ASVG	Allgemeines Sozialversicherungsgesetz – General Social Security Act	IIF	Institute of International Finance
A-Trust	A-Trust Gesellschaft für Sicherheitssysteme im elektronischen Datenverkehr GmbH (accredited certification service provider)	IIP	international investment position
ATX	Austrian Traded Index	IMF	International Monetary Fund
BCBS	Basel Committee on Banking Supervision (BIS)	ISO	International Organization for Standardization
BIC	Bank Identifier Code	IWI	Industriewissenschaftliches Institut – Austrian Institute for Industrial Research, Vienna
BIS	Bank for International Settlements	JVI	Joint Vienna Institute
BOP	balance of payments	LIBOR	London Interbank Offered Rate
BSC	Banking Supervision Committee (ESCB)	M3	broad monetary aggregate M3
CACs	collective action clauses	MFI	monetary financial institution
CEBS	Committee of European Banking Supervisors (EU)	MRO	main refinancing operation
CEE	Central and Eastern Europe	MoU	memorandum of understanding
CEEC(s)	Central and Eastern European country (countries)	NACE	Statistical Classification of Economic Activities in the European Community
CESEE	Central, Eastern and Southeastern Europe	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	Österreichische Bundesfinanzierungsagentur – Austrian Federal Financing Agency
ECB	European Central Bank	ÖNACE	Austrian Statistical Classification of Economic Activities
Ecofin	Economic and Financial Affairs Council (EU)	POS	point of sale
EEA	European Economic Area	PRGF	Poverty Reduction and Growth Facility (IMF)
EFC	Economic and Financial Committee (EU)	R&D	Research & Development
EIB	European Investment Bank	RTGS	Real-Time Gross Settlement
EMS	European Monetary System	SDR	Special Drawing Right (IMF)
EMU	Economic and Monetary Union	SDRM	Sovereign Debt Restructuring Mechanism (IMF)
EONIA	Euro OverNight Index Average	SEPA	Single Euro Payments Area
ERM II	exchange rate mechanism II (EU)	SPF	Survey of Professional Forecasters
ERP	European Recovery Program	STEP2	Straight-Through Euro Processing system provided by the Euro Banking Association
ESA	European System of Accounts	STUZZA	Studiengesellschaft für Zusammenarbeit im Zahlungsverkehr G.m.b.H. – Austrian Society for Payment System Research and Cooperation
ESAF	Enhanced Structural Adjustment Facility (IMF)	S.W.I.F.T.	Society for Worldwide Interbank Financial Telecommunication
ESCB	European System of Central Banks	TARGET	Trans-European Automated Real-time Gross settlement Express Transfer
ESRI	Economic and Social Research Institute, Dublin	Treaty	Treaty establishing the European Community
EU	European Union	UCIT(s)	undertaking(s) for collective investment in transferable securities
EURIBOR	Euro Interbank Offered Rate	ULC	unit labor cost
Eurostat	Statistical Office of the European Communities	UN	United Nations Organization
FATF	Financial Action Task Force on Money Laundering	UNCTAD	United Nations Conference on Trade and Development
FDI	foreign direct investment	VaR	value at risk
Fed	Federal Reserve System (U.S.A.)	WBI	Wiener Börse Index (all-share index of the Vienna stock exchange)
FMA	Austrian Financial Market Authority	WEF	World Economic Forum
FOMC	Federal Open Market Committee (U.S.A.)	WIFO	Österreichisches Institut für Wirtschaftsforschung – Austrian Institute of Economic Research
FSAP	Financial Sector Assessment Program (IMF/World Bank)	wiiw	Wiener Institut für internationale Wirtschaftsvergleiche – The Vienna Institute for International Economic Studies
FWF	Fonds zur Förderung der wissenschaftlichen Forschung – Austrian Science Fund	WKÖ	Wirtschaftskammer Österreich – Austrian Federal Economic Chamber
GAB	General Arrangements to Borrow	WTO	World Trade Organization
GATS	General Agreement on Trade in Services		
GDP	gross domestic product		
GNP	gross national product		
GSA	GELDSERVICE AUSTRIA Logistik für Wertegestionierung und Transportkoordination GmbH (Austrian cash logistics company)		
HICP	Harmonised Index of Consumer Prices		
HIPC	Heavily Indebted Poor Countries		
HOAM.AT	Home Accounting Module Austria		
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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