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Analyses

Economic Crisis Unleashes Deep Recession in Austria – Stabilization Expected at Year-End

Economic Outlook for Austria from 2009 to 2011 (June 2009)

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1 Summary: Deep Recession in 2009

According to the June 2009 economic outlook of the Oesterreichische Nationalbank (OeNB), the Austrian economy is projected to enter a deep recession in 2009 owing to the global slump in growth, with real GDP set to shrink by 4.2%. After further declining by a modest 0.4% in 2010, positive real annual GDP growth of 1.2% will re-emerge only in 2011.

Compared with the OeNB December 2008 economic outlook, growth expectations for 2009 and 2010 were downgraded by 3.9 and 1.2 percentage points respectively. This major revision reflects the steep slump in the demand for exports and investment – unparalleled in the post-war period. The current downturn is so pronounced that GDP levels seen in 2007 will not return until 2011. HICP inflation will ease from 3.2% in 2008 to a mere 0.4% in 2009 and rise modestly to 1.1% and 1.2% in 2010 and 2011 respectively.

The global crisis, which was unleashed by financing difficulties in the U.S. real estate market, increasingly visibly spilled over into the real economy in the course of 2008, causing a global recession in 2009. In the euro area, real GDP growth slowed to 0.7% in 2008. Some euro area countries such as Germany, Italy and Spain were affected by the crisis at an earlier stage

Chart 1

Growth of Real GDP (Seasonally and Working-Day Adjusted)

Quarterly and annual changes in %

Source: Eurostat, OeNB.

and significantly worse than Austria, which still registered real GDP growth of 1.7% in 2008. In recent years, the Austrian real economy outperformed the euro area average in relative terms, posting higher GDP growth, lower unemployment rates and, owing to steadily improving international competitiveness, growing current account surpluses. As a result, Austria was better positioned at the start of the crisis, but eventually also started to feel the impact of external developments.

Preliminary signs of the crisis in the real economy were therefore also evident in Austria in 2008. Since the second quarter of 2008, exports have declined in quarterly terms as has investment since the third quarter of 2008. In the fourth quarter of 2008, real GDP shrank on the previous quarter for the first time since 2001 – compared with other euro area countries, however, the decline by 0.4% was still relatively small.[2] In the first quarter of 2009, however, the crisis dealt a major blow to the Austrian real economy. GDP contracted by 2.8% on a quarterly basis, as did exports and investment by 4.4% each.

The projected recession in Austria will be driven primarily by a further slide in exports, which is also reflected in a decline in investment. While exports were the engine of economic growth these past few years, they will plummet by 8.9% in 2009. The last time Austria registered negative – albeit by a relatively small margin – export growth was in 1993. Despite similarly falling imports, net exports will make a negative growth contribution to real GDP of 1.8 percentage points.

The decline in gross fixed capital formation (−9.5%), which was fueled by a huge implosion of investment in equipment (−15.3%), commenced as early as the second half of 2008 and accelerated in the first quarter of 2009. Not only weakening exports but more difficult financing conditions (availability and risk premiums) prompted companies to curtail investment.

Although private consumption (−0.3%) will have a stabilizing effect in 2009, domestic demand (excluding inventory changes) will make a negative growth contribution of 2.3 percentage points. Despite anticipated negative labor market developments, real disposable household income will grow by a further 0.3% in 2009 owing to high wage settlements and low inflation. In 2010, however, a further rise in unemployment and expected low wage settlements will precipitate a 0.5% decline in real disposable household income. In 2009, the saving ratio will continue to increase to some 12½% owing to precautionary saving motives before decreasing slightly to 12.3% in 2010.

From 2009, the labor market situation is set to deteriorate significantly. In 2009, employment growth will shrink by 1.3% while the number of unemployed will climb by a total of some 132,000 in 2009 and 2010. The (seasonally-adjusted) unemployment rate (Eurostat definition) will increase to 5.3% (2009) and 6.5% (2010) – an unusually steep rise following the low of 3.6% in May 2008. By international standards, however, Austria's jobless rate will remain comparatively low.[3]

Following the historical increase in HICP inflation in 2008, the drop in

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[2] In the fourth quarter of 2008, real GDP in the euro area shrank by 1.6% and in Germany by 2.2% on a quarterly basis. This outlook is based on preliminary GDP data for the first quarter of 2009 ("Q1 Flash").

[3] According to both the European Commission economic outlook (May 2009) and the IMF World Economic Outlook (April 2009), Austria will have the euro area's third-lowest and fourth-lowest unemployment rate in 2010 and 2011 respectively.

OeNB June 2009 Outlook for Austria − Key Results[1]

	2008	2009	2010	2011
Economic activity	*Annual change in % (real)*			
Gross domestic product	+1.7	−4.2	−0.4	+1.2
Private consumption	+0.9	−0.3	+0.0	+0.5
Government consumption	+2.0	−0.1	+0.3	+0.9
Gross fixed capital formation	+0.9	−9.5	−3.0	+1.1
Exports of goods and services	+2.5	−8.9	−0.7	+3.5
Imports of goods and services	+1.3	−6.8	−1.0	+2.8
Contribution to real GDP growth	*Percentage points of GDP*			
Private consumption	+0.5	−0.2	+0.0	+0.3
Government consumption	+0.4	+0.0	+0.1	+0.2
Gross fixed capital formation	+0.2	−2.1	−0.6	+0.2
Domestic demand (excluding changes in inventories)	+1.0	−2.3	−0.6	+0.7
Net exports	+0.8	−1.8	+0.1	+0.5
Changes in inventories (including statistical discrepancy)	−0.1	−0.1	+0.0	+0.0
Prices	*Annual change in %*			
Harmonised Index of Consumer Prices (HICP)	+3.2	+0.4	+1.1	+1.2
Private consumption expenditure (PCE) deflator	+2.9	+0.5	+0.9	+1.2
GDP deflator	+2.3	−0.2	+0.6	+1.4
Unit labor costs in the total economy	+2.9	+4.9	−1.0	+0.0
Compensation per employee (at current prices)	+3.0	+2.1	+0.3	+1.1
Productivity (whole economy)	+0.1	−2.7	+1.3	+1.1
Compensation per employee (real)	+0.1	+1.6	−0.6	−0.2
Import prices	+3.6	+0.6	+0.3	+1.2
Export prices	+1.2	−0.4	+0.6	+1.2
Terms of trade	−2.4	−0.9	+0.2	+0.0
Income and savings				
Real disposable household income	+2.0	+0.3	−0.5	+0.8
	% of nominal disposable household income			
Saving ratio	12.4	12.6	12.3	12.4
Labor market	*Annual change in %*			
Payroll employment	+1.9	−1.3	−1.6	+0.1
	% of labor supply			
Unemployment rate (Eurostat definition)	3.8	5.3	6.5	6.6
Budget	*% of nominal GDP*			
Budget balance (Maastricht definition)[2]	−0.4	−5.0	−6.3	−6.2
Government debt	62.5	72.2	79.1	83.3

Source: 2008: Eurostat, Statistics Austria; 2009 to 2011: OeNB June 2009 outlook.

[1] The outlook was drawn up on the basis of seasonally adjusted and working-day adjusted national accounts data. Therefore, the historical values for 2008 may deviate from the nonadjusted data released by Statistics Austria.

[2] The OeNB expects a deficit-increasing one-off effect of 0.3 percentage points for 2009 as a result of the EU's own resources decision of June 2007.

energy and commodity prices will temporarily induce negative inflation in the second half of 2009 and very low inflation of 0.4% for the year as a whole. Despite falling manufacturing and service prices, inflation will climb back up to a modest 1.1% in 2010. In 2011, it is projected to rise marginally to 1.2%

The general government budget deficit (Maastricht definition) will deteriorate by 4.6 percentage points to

−5.0% of GDP[4] in 2009 and to −6.3% (−6.2%) of GDP in 2010 (2011). As a result, fiscal policy will markedly mitigate the repercussions of the recession in Austria. The OeNB June 2009 economic outlook includes all measures that had been approved by the cutoff date for data (May 22, 2009) for this publication.

2 Assumptions: Sharply Falling Money Market Rates, Lower Euro Exchange Rate and Oil Price

This forecast is the OeNB's contribution to the Eurosystem's June 2009 staff projections. The forecast horizon ranges from the second quarter of 2009 to the fourth quarter of 2011. May 13, 2009, was the cutoff date for the assumptions on global growth as well as interest rates, exchange rates and crude oil prices. The OeNB used its macroeconomic quarterly model to prepare the projections for Austria.[5]

The key data source comprised seasonally and working day-adjusted national accounts data computed by the Austrian Institute for Economic Research (WIFO), which were fully available to the fourth quarter of 2008. The GDP flash estimate is available for the first quarter of 2009 but covers only part of the national accounts aggregates.

The underlying short-term interest rate is based on market expectations for the three-month EURIBOR. It is set at 1.4% (2009), 1.6% (2010) and 2.5% (2011) respectively. Long-term interest rates reflect market expectations for ten-year government bonds and are set at 4.2% (2009), 4.6% (2010) and 5.0%

(2011) respectively. Corporate loan spreads are implemented in this outlook on a time-varying basis and amount to around 25 basis points.[6] The USD/EUR exchange rate is assumed to remain at USD/EUR 1.34. The projected trend in crude oil prices is based on futures prices. For 2009, we assume oil prices of USD 54.5 per barrel (Brent) and, for 2010 and 2011, USD 65.5 and USD 70.3 per barrel (Brent) in each successive year. This signifies a revision of USD −12.8 (2009) and USD −11.1 (2010), compared with the OeNB December 2008 economic outlook. The prices of commodities excluding energy are also based on futures prices over the forecast horizon. Market participants expect commodity prices to increase over the forecast horizon as a whole. The budget forecast includes only those measures that had been agreed and suitably specified at the time the current OeNB outlook was prepared.

3 World Economy in Recession in 2009

The world economy will contract sharply in 2009 as a result of the global economic and financial crisis. The global recession was unleashed by the financial crisis arising from the U.S. real estate market. Loss of confidence in the financial sector led to major refinancing problems in the interbank market, which was countered via a generous injection of liquidity from central banks. The low capital ratio of many financial institutions prompted emergency sales of securities and induced dramatic price slumps. A number of financial institutions became insolvent or

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[4] The OeNB expects a deficit-increasing one-off effect of 0.3 percentage points for 2009 as a result of the EU's own resources decision of June 2007.

[5] For a description of the OeNB's macromodel, see Schneider and Leibrecht (2006).

[6] The spread on corporate loans is defined as the difference between the average interest rate on corporate loans and the interest rate on ten-year government bonds.

were rescued only thanks to government measures. The peak of this development was marked by the weeks following the collapse of the formerly fourth-largest U.S. investment bank Lehman Brothers in September 2008. This event significantly accelerated the global downturn already underway. World trade then slumped sharply at the turn of 2008/09.[7] Export-led economies such as Japan and Germany were directly affected. Of the new EU Member States, the Baltic countries were particularly badly hit by the crisis. According to current analysis, the global slump reached a low in the first quarter of 2009 and should slow significantly from the second quarter of 2009. The world economy is expected to grow modestly in the second half of 2009.

3.1 Industrialized Countries to Experience Deep Recession in 2009

The *U.S.A.* suffered significant economic contraction in both the fourth quarter of 2008 (−6.3%) and the first quarter of 2009 (−6.1%).[8] Since the U.S.A. has a relatively small degree of openness compared to other countries, the trade crisis — exports slumped by 30% in the first quarter of 2009 — is having a comparatively small impact on aggregate growth.[9] At the same time, the U.S.A. was relatively badly affected by the financial crisis. As a result, fixed capital formation contracted by 37.9% in the first quarter of 2009. In this case, fixed capital formation comprised investment in equipment (−34%), as well as both commercial construction investment (−44%) and residential con-

struction investment (−38%). Growth in new orders as well as both sentiment and residential construction indicators currently suggest that the investment slump is bottoming out. Private consumption unexpectedly grew by +2.2% in the first quarter of 2009 (fourth quarter of 2008: −4.3%). Not least owing to swift and comprehensive economic policy measures, the U.S. economy is projected to recover in the second half of 2009. From 2009 to 2011, fiscal measures will amount to some USD 663 billion, or 4.6% of GDP. The Fed reacted by cutting the key policy rate to 0.25% and introducing extensive quantitative easing measures totaling around USD 1,500 billion.

Non-Japan Asia could not avoid the economic crisis either. Owing to their large degree of openness, small open economies such as Singapore or Hong Kong have been as severely affected as emerging economies (e.g. Thailand or South Korea). China countered the economic downturn by swiftly introducing government support measures. Although growth is below potential — proven by the rise in unemployment — China is now seen as an engine of economic growth amid hope for a swift global recovery. By contrast, *Japan's* economic performance in the first quarter of 2009 contracted by as much as 4.0% on a quarterly basis (fourth quarter of 2008: −3.8%). This makes Japan the country hardest hit in the world by the trade crisis. Japanese GDP fell to its 2003 levels. Exports plummeted by 26% in the first three months of 2009 compared with the fourth

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[7] Monthly data for world trade are provided by CPB Netherlands Bureau for Economic Policy Analysis (www.cpb.nl/eng/research/sector2/data/trademonitor.html). World trade volumes (seasonally adjusted) registered the following growth on a monthly basis: 10/08: +0.3%; 11/08: −6.6%; 12/08: −5.8%; 01/09: −5.9%; 02/09: +1,1%; 03/09: −0.5%.

[8] All values for the U.S.A. represent annualized quarterly growth rates. The annualized figure of 6.3% is approximately equal to a change in quarterly growth of 1.6%.

[9] Imports are down by as much as 34%, resulting in net exports making a positive contribution to GDP growth.

Table 2

Underlying Global Economic Conditions

	2008	2009	2010	2011
Gross domestic product	*Annual change in % (real)*			
World GDP growth outside the euro area	+3.5	−1.6	+2.1	+3.6
U.S.A.	+1.1	−3.3	+0.3	+1.6
Japan	−0.7	−6.5	−0.9	+1.0
Asia excluding Japan	+6.8	+2.8	+5.8	+6.8
Latin America	+4.1	−2.8	+1.6	+3.1
United Kingdom	+0.7	−4.1	+0.2	+1.5
New EU Member States[1]	+4.1	−3.0	+0.2	+2.7
Switzerland	+1.6	−2.5	+0.3	+1.6
Euro area[2]	+0.6	−5.1 to −4.1	−1.0 to +0.4	×
World trade (imports of goods and services)				
World economy	+3.3	−13.3	+0.8	+4.2
Non-euro area countries	+4.2	−14.0	+1.4	+4.7
Real growth of euro area export markets	+3.7	−13.0	+1.0	+4.1
Real growth of Austrian export markets	+2.5	−12.4	+0.1	+3.6
Prices				
Oil price in USD/barrel (Brent)	97.7	54.5	65.5	70.3
Three-month interest rate in %	4.6	1.4	1.6	2.5
Long-term interest rate in %	4.4	4.2	4.6	5.0
USD/EUR exchange rate	1.47	1.33	1.34	1.34
Nominal effective exchange rate (euro area index)	113.03	112.35	112.49	112.49

Source: Eurosystem.

[1] *Member States that joined the EU in 2004 and 2007 and have not yet introduced the euro: Czech Republic, Hungary, Poland, Romania, Bulgaria, Estonia, Latvia, Lithuania.*

[2] *Results of the Eurosystem's June 2009 projections. The ECB presents the result in ranges based upon average differences between actual outcomes and previous projections.*

quarter of 2008. In addition, negative growth stimuli came from domestic demand (investment: −8.0%, private consumption: −4.0%) in the first quarter of 2009.

The *United Kingdom* has been in recession since mid-2008, which further deepened in 2009. At the same time, both hard facts such as industrial production and soft facts such as the purchasing managers' index (EMI) point to a recovery as early as the second half of 2009. *Switzerland*, too, could not decouple itself from the global economic crisis: its economy is set to shrink in 2009 and stagnate in 2010.

The GDP growth outlooks of *EU Member States* which acceded in 2004 and 2007 and have not yet introduced the euro (Czech Republic, Hungary, Poland, Romania, Bulgaria, Estonia, Latvia, Lithuania) have gradually been revised down sharply in the past months. While on a cumulated basis, these countries will still have a positive growth differential vis-à-vis the euro area, individual trends and, in particular, risk assessments vary widely across countries. While the Baltic countries are already in deep recession and Hungary and Romania are set to enter major recessions, Poland and the Czech Republic are expected to suffer only a comparatively weak recession in 2009. For the region as a whole, nevertheless, a relatively swift recovery is anticipated in 2011.
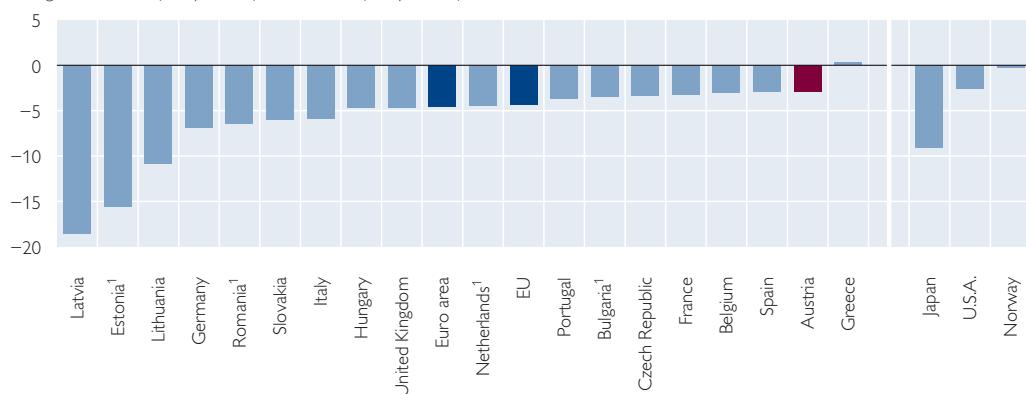
3.2 Economic Performance Down More Sharply in the Euro Area than in the U.S.A.

Chart 2 shows real GDP growth in EU countries and selected peer countries within the previous 12 months (between the first quarter of 2008 and the

Chart 2

Real GDP Growth

Change between the first quarter of 2008 and the first quarter of 2009 in %

Source: Eurostat, OeNB.

[1] Basis: Nonseasonally-adjusted data.

first quarter of 2009). The source of the economic crisis was in the Anglo-American area. However, as chart 2 illustrates, in the first quarter of 2009 export-led countries were hit more severely by the crisis than the countries where the crisis had originated.

A comparison of the three largest economic areas reveals that the contraction in economic performance in 2008 was most pronounced in Japan, followed by the euro area (and the EU) and the U.S.A. A very heterogeneous picture also emerges within Europe, with Ireland and Germany affected to an above-average extent. Like Spain, Ireland also witnessed the bursting of a home-grown real estate bubble. Austria and Greece have so far been least affected by the slowdown in growth.

The global trade shock is giving rise to a similar picture in almost all export-led countries. In *Germany*, real GDP, after falling sharply by 2.2% in the fourth quarter of 2008 (on a quarterly basis), declined by a further hefty 3.8%

in the first quarter of 2009. As a result, Germany, a strongly export-led country, is particularly suffering from the impact of the trade crisis. During the previous boom (between the second quarter of 2003 and the first quarter of 2008), GDP growth was some 10½%. Net exports and gross fixed capital formation contributed 6 percentage points and some 3¾ percentage points respectively to GDP growth, with private consumption and government consumption sharing the remaining percentage points.[10] Net exports' contribution to growth has however reversed in recent quarters: while exports fell by more than 23% year on year in January and February 2009, imports were down by no more than 17%. The slump in exports resulted in a record underutilization of production capacity, which fell by 14 percentage points to an all-time low of 71.8% in the fourth quarter of 2008 and the first quarter of 2009. Aggravated by negative sales prospects, this underutilization of pro-

[10] *By contrast, Austria generated growth of around 14¾% in the same period, with net exports, gross fixed capital formation and private consumption accounting for 3½ percentage points, 3 percentage points and more than 5 percentage points respectively.*

duction capacity resulted in a marked decline in investment activity, which was further accelerated in the construction industry by unfavorable weather conditions. Only consumption served as a pillar of economic activity despite its basically weak growth. In the first quarter of 2009, however, consumption was fueled by high wage settlements, the continued robust labor market driven by a generous regulation governing short-time working, and a car-scrappage scheme. After the current wage settlements and the car-scrappage scheme have come to an end, labor market developments will however have a comparatively larger influence on private consumer demand, which therefore represents the largest forecast risk. Two key indicators currently offer hope of a swift end to this crisis: industrial production and the ifo business expectations. After already bottoming out, both signal a marked improvement in the second half of 2009.

Italy – Austria's second-largest trading partner – is also currently in a deep recession, which commenced as early as in the first half of 2008. Owing to various structural problems (low productivity growth, flagging competitiveness and high public debt), the recession will persist until mid-2010. Unlike in Germany, real GDP growth in *France* is relatively strongly driven by domestic demand. However, France cannot avoid the global economic crisis either. The French economy has been shrinking since the second quarter of 2008. According to recent industrial production data, France too is in deep recession in 2009.

The Eurosystem anticipates GDP growth will slump to –5.1% to –4.1% in 2009 and range between –1.0% and +0.4% in 2010.

4 Austria Cannot Avoid Recession

4.1 Austrian GDP Growth Plummets in the First Quarter of 2009

Thanks to its excellent position at the start of the crisis compared with its international peers, Austria was affected by the global economic crisis only at a relatively late stage. Compared with the euro area, Austria registered higher than average real GDP growth, lower unemployment and (for years) steadily increasing current account surpluses as a result of improving international competitiveness. On the expenditure side, private consumption is being fueled by relatively high wage settlements in 2008 and by the numerous tax measures and government transfers aimed at increasing disposable household income. In addition, low inflation is boosting real disposable household income. On the output side, particularly benign winter tourism (from October 2008 to March 2009, bed nights rose by +2.8% on a seasonally-adjusted basis) and the healthy construction industry (8% of value added) made an impact. In addition, stimuli fuelling economic activity came from retail sales in January (+2.0%) and March 2009 (+1.0%).

However, Austria cannot avoid the global downturn either. The crisis affected the country with a time lag in the first quarter of 2009. As in other export-led countries, the crisis of negative global demand resulted in a sharp collapse in export demand[11] and in a huge underutilization of production capacity. Aggravated by negative corporate sales expectations and difficult financing conditions, investment activity is also declining rapidly. The decline in employment and rapidly rising unemployment are dampening growth in

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[11] *For further information, see also Ragacs and Vondra (2008).*

Box 1

When will the Turning Point in the Economy Be Reached?

The euro area has been in recession since mid-2008 and the pace of economic downturn has accelerated further over the last six months. In light of growing signs of economic recovery in the past few weeks, the exact timing of the turning point in the economy is currently being hotly discussed. Since the definition and identification of economic cycles vary in economic literature, the definitions of a turning point are commensurately different and diverse. According to the simplest definition, turning points in the economy describe the transition from boom to bust or from depression to recovery. In the current economic debate, however, turning points in the economy are frequently defined differently. According to this definition, turning points in the economy are reached in quarters with the most negative quarterly growth rate.[1] This definition, however, implies a false picture of the business cycle since the GDP level will continue to fall after the current turning point is reached according to this outlook. In fact, only the tempo of the recession will slow down.

In this article, a turning point in the economy (to recovery) is defined as the first of two successive quarters with a positive quarterly growth rate following a recession (i.e. at least two quarters of negative quarterly growth). Specifying the exact timing of the turning point continues to be problematic. While some euro area countries (e.g. Germany, Italy and Spain) were already in recession in 2008, Austria still registered mildly positive growth up to (and including) the third quarter of 2008. This delay is explicable by various factors: Austria's higher pre-crisis growth rates, its positive balance of trade, low unemployment, early adoption of fiscal measures etc. All in all, the country was better positioned at the outbreak of the crisis. It is also important to note that the source of this crisis is external. Thus, the recovery of the Austrian economy will not occur with a time lag like the slump did but in line with international developments.

The turning point in the economy is expected in early 2010 (for further details, see also chart 1 on quarterly growth trends of the current outlook). So-called green shoots – economic indicators signaling recovery – have been evident for Austria since mid-May 2009. These green shoots include:

– *the bottoming out of new orders and industrial production according to Statistics Austria up to (and including) March 2009,*
– *the bottoming out of the Economic Sentiment Indicator (ESI) in May 2009,*
– *the Purchasing Managers' Index of Bank Austria and most of this indicator's subindices,*
– *the ESI component of export volume expectations in manufacturing industry,*
– *the expectations component of the Federation of Austrian Industry's economic barometer, and*
– *the performance of the Wiener Börse Index since early March 2009.*

External green shoots are even more important than their Austrian counterparts. Their number has increased significantly since mid-April 2009. These international indicators include certain hard facts such as new orders and industrial production but also various confidence indicators such as the ESI, the ifo business expectations and the Purchasing Managers' Index (PMI).

[1] *In most forecasts available, this point was reached in the first quarter of 2009.*

Austrian Green Shoots

Hard Facts

Annual change in %

Last observation: March

— Industrial production　— Order intake

Source: Statistics Austria.

Economic Sentiment Indicator

Last observation: May

Source: European Commission.

FAI Economic Barometer

Last observation: March

— Business situation in 6 months

Source: Federation of Austrian Industry (FAI).

ESI: Export Expectations

Last observation: April

Source: European Commission.

Bank Austria Purchasing Managers' Index

Last observation: April

Source: Bank Austria.

ATX

Last observation: end-May

Source: Wiener Börse.

household income and encouraging precautionary saving, thus driving down private consumption.

4.2 Exports Plummet in 2009

The slump in global demand triggered a marked acceleration in the decline of exports in January and February 2009. According to Statistics Austria, exports fell by 25% year on year in the first two months of 2009. Exports to Central, Eastern and Southeastern Europe (CE-SEE) as well as to Central Asia[12] were somewhat worse affected by the collapse in global demand (–29.1%; EU Member States which joined in 2004 and 2007: –29.2%) than exports to the euro area (–24.9%). On a working day-adjusted basis, nominal goods exports declined by about 20% year on year in January and February 2009 (Fenz and Schneider, 2009). On the basis of truck toll data provided by Austria's highway operator, ASFINAG, the OeNB forecasts a continued decline in nominal goods exports of around 20% (year on year) in both March and April 2009. Services exports will not sufficiently soften this setback. According to non-seasonally-adjusted national accounts data, goods and services exports plummeted by 18.9% in the first quarter of 2009. At the same time, imports were down by 17.8%, generating only a small net effect in Austria (in contrast to Germany). Although real exports data were revised downward in the seasonally-adjusted national accounts series, the

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[12] *For a precise definition of regions, see Ragacs and Vondra (2009).*

Table 3

Growth and Price Development in Austria's External Trade

	2008	2009	2010	2011
Exports	*Annual change in %*			
Competitor prices in Austria's export markets	+2.4	−2.5	−0.1	+0.7
Export deflator	+1.2	−0.4	+0.6	+1.2
Changes in price competitiveness	+1.2	−2.1	−0.6	−0.5
Import demand in Austria's export markets (real)	+2.5	−12.4	+0.1	+3.6
Austrian exports of goods and services (real)	+2.5	−8.9	−0.7	+3.5
Market share	−0.1	+3.5	−0.7	−0.2
Imports				
International competitor prices in the Austrian market	+2.1	−2.5	−0.1	+0.7
Import deflator	+3.6	+0.6	+0.3	+1.2
Austrian imports of goods and services (real)	+1.3	−6.8	−1.0	+2.8
Terms of trade	−2.4	−0.9	+0.2	+0.0
	Percentage points of real GDP			
Contribution of net exports to GDP growth	+0.8	−1.8	+0.1	+0.5

Source: 2008: Eurostat; 2009 to 2011: OeNB June 2009 outlook, Eurosystem.

effects of this severe trade shock are still not evident to a corresponding degree. In the first quarter of 2009, real exports declined by some 4½% on a quarterly basis.

Following the export slump in early 2009, export growth expectations have been gloomy. In addition to the decline in exports in recent months, this gloom is primarily attributable to the development in new foreign orders. At –35%, the latter fell much more sharply in the first quarter of 2009 than domestic new orders (about –18%). However, a glimmer of hope came from export volume expectations in manufacturing industry, which are published on a quarterly basis as a component of the ESI. These expectations – which had deteriorated since the third quarter of 2007, thus signaling the crisis early on – improved for the first time in April 2009.

According to the OeNB, exports are projected to fall by 8.9% in 2009 and by a further 0.7% in 2010. Export volumes in 2010 will therefore only slightly exceed 2006 levels.

Table 4

Austria's Current Account

	2008	2009	2010	2011
	% of nominal GDP			
Balance of trade	4.7	2.5	3.5	4.2
Balance on goods	−0.1	−0.7	−0.2	0.3
Balance on services	4.8	3.2	3.6	3.9
Euro area	0.0	−1.0	−1.0	−0.6
Non-euro area countries	4.7	3.6	4.5	4.8
Balance on income	−0.8	−0.9	−0.8	−0.9
Balance on current transfers	−0.4	0.1	0.1	0.0
Current account	3.5	1.7	2.7	3.3

Source: 2008: Eurostat; 2009 to 2011: OeNB June 2009 outlook.

Fueled by private consumption, imports will shrink less sharply than exports in 2009 (–6.8%); owing to the slump in exports and investment, however, imports will also be down in 2010 as a whole (–1%). As a result, imports too will fall almost to 2006 levels.

In 2008, Austria generated a current account surplus of EUR 9.8 billion (+3.5% of nominal GDP). This surplus continued the growth trend which had persisted since 2005. Although the massive slump in exports in 2009 will interrupt this trend temporarily, the current account will still be in the black in 2009 according to the OeNB. The balance on both goods and services will deteriorate substantially, with the balance on goods even showing a deficit. The regional breakdown of the trade surplus is barely changed. While the trade balance with the euro area will be in the red, it will still be in surplus with countries outside the euro area. The long-term trend in the improving current account is expected to resume in 2010 and 2011, with the trade surplus with countries outside the euro area growing faster than the trade deficit with euro area countries decreases. The balance on income will barely change over the forecast horizon, while the balance on transfers should moderately improve in 2009, thereafter remaining almost unchanged.

4.3 Sharp Slump in Investment Activity

In its December 2008 outlook, the OeNB already anticipated a contraction in gross fixed capital formation in 2009. Since then, the external environment and the sales performance of Austrian exporters have deteriorated significantly. Investment demand depends heavily on export growth, however – according to an OeNB estimate, a 1 percentage point decline in export growth triggers a deterioration in investment growth of about 0.5 percentage points[13] – so that plummeting exports have triggered a sharp slump in investment activity. In the first quarter of 2009, investment shrank by 4.4%; according to a current national accounts' flash estimate (May 15, 2009), investment activity has been flagging since the third quarter of 2008 (third quarter of 2008: –0.9%, fourth quarter of 2008: –1.7%). In addition, sluggish consumption growth is dampening investment momentum. The continued contraction of domestic export markets in 2009 and falling domestic demand are inducing a marked drop in investment activity.

This decline in investment is, however, also driven by rising financing costs and tightening financing conditions. Corporate *financing* has changed considerably since the outbreak of the financial crisis,[14] in the wake of which equity financing has come to a standstill. Bond-based financing continued to expand in an attenuated form. In the fall of 2008, however, yields on corporate bonds rose steeply and stabilized at a high level. Bank loans therefore became more important again in 2008, making a contribution to external financing of almost 73% in the second half of 2008 (first half of 2008: about 31%). Lending to nonfinancial corporations has so far continued to grow. In

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[13] As a result of the global trade shock, the current OeNB outlook on import demand of Austria's trading partners was downgraded by some 14 percentage points compared with the December 2008 economic outlook. A 1 percentage point contraction in Austrian export markets induces a decline in investment by approximately 0.4 percentage points. Owing to the repercussions of the trade shock, investment is down by some 5½ percentage points, thereby explaining some two-thirds of the downward revision of investment demand since the previous outlook.

[14] For further details, see Financial Stability Report 17 (OeNB, 2009).

Table 5

Investment Activity in Austria

	2008	2009	2010	2011
	Annual change in %			
Total gross fixed capital formation (real)	+0.9	−9.5	−3.0	+1.1
of which: Investment in plant and equipment (real)	*+2.3*	*−15.3*	*−7.4*	*+1.9*
Residential construction investment (real)	*−0.2*	*−0.6*	*−0.1*	*+0.2*
Nonresidential construction investment and other investment	*+2.9*	*−2.2*	*−0.7*	*+1.0*
Government investment (real)	*+2.1*	*+3.3*	*+1.8*	*+1.8*
Private investment (real)	*+0.8*	*−10.1*	*−3.3*	*+1.1*
	Contribution to total gross fixed capital formation growth in percentage points			
Investment in plant and equipment (real)	+0.9	−6.2	−2.8	+0.7
Residential construction investment (real)	+0.0	−0.1	+0.0	+0.0
Nonresidential construction investment and other investment	+1.2	−0.9	−0.3	+0.5
Government investment (real)	+0.1	+0.2	+0.1	+0.1
Private investment (real)	+0.8	−9.6	−3.1	+1.0
	Contribution to real GDP growth in percentage points			
Inventory changes (real)	−0.1	−0.1	+0.1	+0.0

Source: 2008: Eurostat; 2009 to 2011: OeNB June 2009 outlook.

March 2009, annual lending growth was 7.0%, still exceeding its pre-crisis levels (July 2007: +6.6%). Overall, external corporate financing was about one-third lower in 2008 than the previous year.

Corporate *financing costs* have fallen in recent months compared with the developments in the fourth quarter of 2008, as the banking sector passed on key policy rate cuts by the ECB (box 3). Nevertheless, banks' *credit standards* (required collateral etc.) have further tightened in recent months, which was partly also attributable to the deteriorated economic outlook and more cautious risk assessments and ratings.

As the most cyclically sensitive investment component, *investment in equipment* has been the most severely affected by the slump. The OeNB therefore expects a marked decline of 15.3% in 2009 and continued contraction of some 7½% in 2010. *Construction investment* is less cyclically sensitive than other types of investment. Compared with other sectors of the economy,

the construction industry for the time being still has a relatively healthy order book, which is supported by infrastructure measures adopted in two economic stimulus packages and by subsidies for energy efficiency renovation (box 3 and Köhler-Töglhofer and Reiss, 2009). Although confidence in the construction sector (WIFO survey for the ESI) continued to falter in March 2009, it has since stabilized at this level. In 2009 and 2010, however, only *government investment* will make a positive contribution to real GDP growth (0.2 and 0.1 percentage points, respectively). The OeNB expects *gross fixed capital formation* to shrink by 9.5% in 2009 and by 3.0% in 2010. Moderately positive growth in investment demand is expected to return only in 2011.

4.4 Consumption, Despite Slight Decline, Continues to Stabilize Economy

Compared with the December 2008 economic outlook, the revision of OeNB's growth forecast for private con-

Table 6

Determinants of Nominal Household Income in Austria

	2008	2009	2010	2011
	Annual change in %			
Employees	+1.9	−1.3	−1.6	+0.1
Wages per employee	+3.0	+2.1	+0.3	+1.1
Compensation of employees	+4.9	+0.8	−1.3	+1.2
Mixed income and operating surplus, net	+13.7	−12.6	−2.7	+5.9
Property income[1]	+4.0	−1.1	+1.4	+2.2
	Contribution to disposable household income in percentage points			
Compensation of employees	+4.0	+0.6	−1.0	+1.0
Mixed income and operating surplus, net	+1.9	−1.9	−0.3	+0.7
Property income	+0.8	−0.2	+0.3	+0.4
Net transfers minus direct taxes[1]	−1.8	+3.4	+1.5	−0.1
Disposable household income (nominal)	+5.0	+0.7	+0.4	+2.0

Source: 2008: Eurostat; 2009 to 2011: OeNB June 2009 outlook.

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

sumption at −0.8 percentage points was downgraded much less sharply than its export and investment forecast. While export demand and its corollary investment demand were directly affected by the global demand shock, private consumer demand is reacting only with a time lag to dampened income growth, growing unemployment, tighter consumer credit conditions and deteriorating expectations about the future. However, private consumption will also be directly and indirectly fueled by economic measures over the forecast horizon.

Despite early signs of the crisis, 2008 was still characterized by dynamic growth in aggregate *disposable nominal household income* (+5.0%) owing to unusually high employment growth (+1.9%). Steep inflation on the back of international commodity price growth caused real wages to decline, however, which, among other things, led to relatively high wage settlements for 2009, with negotiated wages up by +3.2%. Despite robust wage growth, however, 2009 can expect to see a sharp decline in disposable nominal

household income growth for two reasons. First, the crisis has now reached the Austrian labor market in full force and, second, all other household income factors such as investment and profit income are deteriorating sharply.

According to the OeNB, the labor market crisis will induce a drop in payroll employment numbers in 2009 and 2010, which is expected to stabilize only in 2011. Owing to the crisis, furthermore, the wage drift will be very negative over the forecast horizon. Although *wages* per employee will rise nominally by 2.1% in 2009, the compensation of employees will only edge up by 0.8% (2008: +4.9%). The far lower wage settlements owing to the crisis mean that 2010 will witness even nominally negative growth in the compensation of employees (−1.3%). Modest growth (+1.2%) is anticipated in 2011. *Mixed income of self-employed households and operating surpluses* will decline in 2009 (−1.1%). However, positive growth is projected for 2010 and 2011. *Investment income* will plummet by 12.6% in 2009 and by 2.7% in 2010 (2008: +13.7%). It is not expected to

Table 7

Private Consumption in Austria

	2008	2009	2010	2011
	Annual change in %			
Disposable household income (nominal)	+5.0	+0.7	+0.4	+2.0
Private consumption expenditure (PCE) deflator	+2.9	+0.5	+0.9	+1.2
Disposable household income (real)	+2.0	+0.3	−0.5	+0.8
Private consumption (real)	+0.9	−0.3	+0.0	+0.5
	% of nominal disposable household income			
Saving ratio	12.4	12.6	12.3	12.4

Source: 2008: Eurostat; 2009 to 2011: OeNB June 2009 outlook.

recover until 2011. Wealth effects are influencing private consumer demand in Austria only to a relatively limited extent, however.[15]

The OeNB expects disposable nominal household income growth to fall from 5% (2008) to +0.7% (2009). At +0.4% in 2010, nominal household income will grow sluggishly before strengthening somewhat in 2011.

The banking sector passed on key policy rate cuts to households to a smaller extent than to enterprises (box 3). Likewise, the further rise in the *saving ratio,* which was anticipated for 2009, is dampening growth in consumer demand. The saving ratio rose steadily from 2003 to 2008. In this period, growth in real disposable household income was driven to an above-average extent by investment income and mixed income accruing to self-employed households, which exhibit lower than average marginal consumer demand. This is not the case in 2009. Instead, the sharp deterioration in consumer confidence is expected to give rise to increased precautionary saving and consumer restraint. Owing to the decline in the compensation of employees, however, the saving ratio will decrease in 2010 before stabilizing in 2011.

In 2009, consumption-stimulating *economic measures* (including inflation package) will total EUR 4.36 billion (see also box 3 as well as Köhler-Töglhofer and Reiss, 2009). Private demand will be fueled primarily by the front-loaded tax reform and various transfers increases. By contrast, the consumption-stimulating effects of the car-scrap bonus are very limited according to the OeNB's simulations and, in the best scenario, will generate a GDP effect of 0.1 percentage points in 2009.

Private consumption growth was slightly negative in the fourth quarter of 2008 and in the first quarter of 2009 (in both quarters: −0.1% on a quarterly basis). The consumption outlook for 2009 to 2011 reflects the aforementioned trends. With projected inflation rates factored in, real consumption growth will slow marginally by −0.3% in 2009, stagnate in 2010 and pick up modestly in 2011. Compared with the export and investment outlooks, private consumption is thus expected to stabilize GDP growth during the recession.

[15] *For more details, see Fenz and Fessler (2008) and the OeNB December 2008 outlook (Ragacs and Vondra, 2008).*

Box 2

The Crisis in a Historical Context

Since World War II, Austria has been affected by six major economic downturns (including the current crisis). As the table below shows, the current financial and economic crisis is the longest recession of the Second Republic (five quarters of negative growth) according to the current outlook.
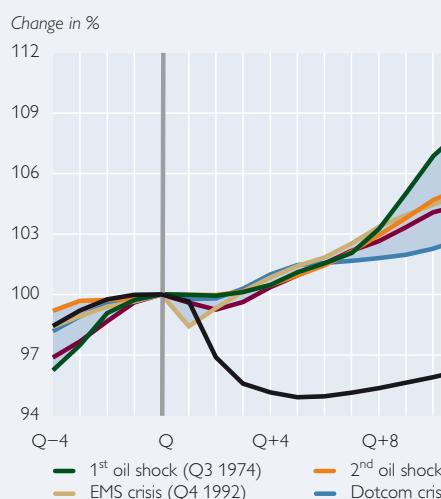
Economic Crises in Austria

	Last quarter of positive growth	Exogenously caused	Number of quarters of negative growth
First oil shock	Q3 1974	×	2
Second oil shock	Q4 1980	×	2
Crisis of Austria's state-owned industries	Q4 1983		2
EMS crisis	Q4 1992	×	1
Dotcom crisis	Q1 2001	×	1
Pattern of the current global crisis	Q3 2008	×	5[1]

Source: Eurostat, OeNB.

[1] OeNB June 2009 outlook.

The left[1] chart below shows that the current crisis is also inducing the deepest downturn in Austria's post-war economy.

GDP Growth, Real

Change in %

Private Consumption Growth, Real

Change in %

Legend:
- 1st oil shock (Q3 1974)
- 2nd oil shock (Q4 1980)
- Crisis of Austria's state-owned industries (Q4 1983)
- EMS crisis (Q4 1992)
- Dotcom crisis (Q1 2001)
- Pattern of the current global crisis (Q3 2008)

Source: Eurostat.

In the current situation, private consumption (right chart above) has a stabilizing effect in the first few quarters, but grows at a slower than average pace hereafter compared with earlier crises. By contrast, the slump in exports (see left chart below) is massive and fairly unique. While export growth was still above average in the quarters preceding the downturn, exports shrank more sharply than in all previous crises owing to the drastic decline in world trade at end-2008/early 2009. In addition, investment (right chart below), has contracted more sharply

[1] The four charts show the percentage change on the base quarter that is defined as the turning point in the economy (standardized to 100) in each case.

in the first year of the recession than in earlier crises. Modest growth is anticipated for the longer forecast horizon, which means that some two years after the onset of the crisis, investment will contract as sharply as in the wake of the first oil shock when the slump in investment was not as drastic but was protracted.

Export Growth, Real

Change in %

Investment Growth, Real

Change in %

- 1st oil shock (Q3 1974)
- EMS crisis (Q4 1992)
- 2nd oil shock (Q4 1980)
- Dotcom crisis (Q1 2001)
- Crisis of Austria's state-owned industries (Q4 1983)
- Pattern of the current global crisis (Q3 2008)

Source: Eurostat.
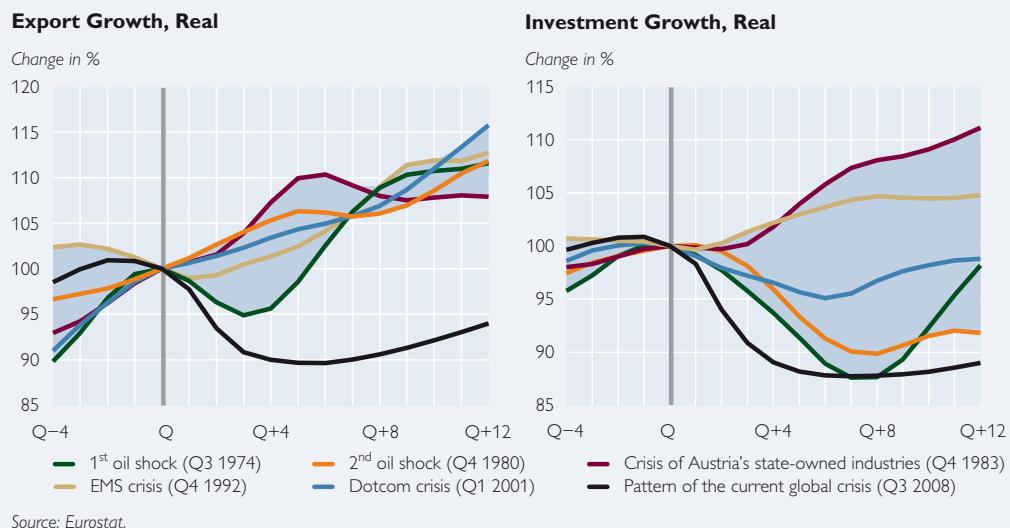
4.5 Labor Market Not Left Unscathed by Crisis

Following impressive growth in 2008, when employment rose by 1.6% and the unemployment rate fell to a (by international standards) very low 3.8%, the economic downturn has not left the labor market unscathed since the turn of the year (2008/09). Unemployment numbers have risen since November 2008 (on an annual basis) and, since February 2009, employment has been

Chart 3

Year-on-Year Monthly Change in Unemployment (Absolute)
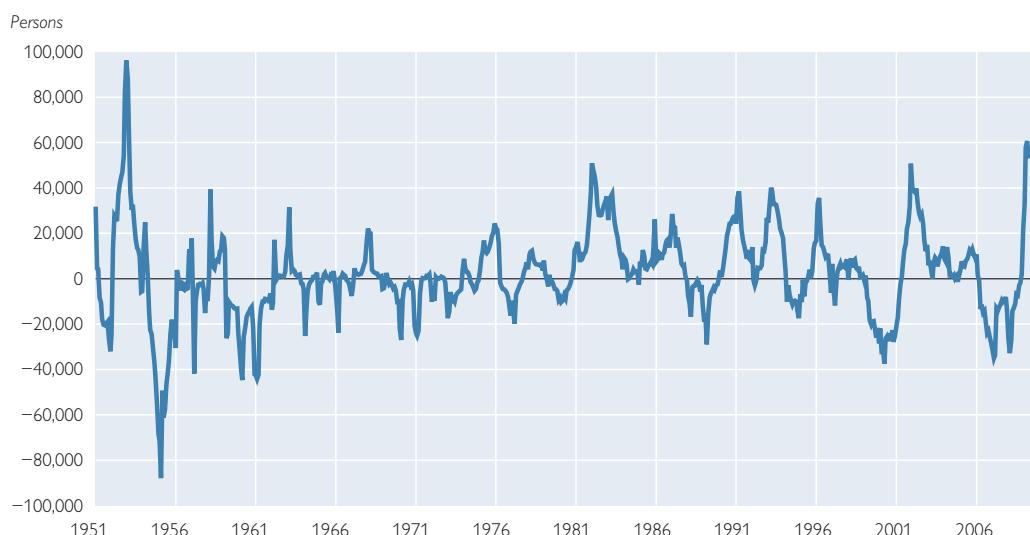
Persons

Source: Statistics Austria.

falling year on year. In the first quarter of 2009, some 50,300 more persons were registered as unemployed than in the same period a year previously. In historical terms, this increase is notable. Although, in previous recessions (2001, 1993, 1988, 1975), the number of registered unemployed persons also rose sharply (in absolute year-on-year monthly terms), only 1952/53 (December 1952: 96,068) witnessed a higher increase than early 2009. This phenomenon is attributable to two factors. First, the rapid rise in unemployment is explicable by a historically more flexible labor market, in which overcapacity generated by the economic boom from 2005 to early 2008 was quickly run down. Second, this situation was aggravated by the winter of 2008/09, which was more severe than the previous year and may be responsible for as much as an additional 10,000 unemployed persons.

Furthermore, other indicators show a sharp deterioration in the labor market situation. At end-April 2009, some 9,700 more people year on year were on training schemes organized by the Austrian employment service (AMS), while the number of vacancies had fallen by 13,600 at the same time. The number of people on short-time working is also soaring. In mid-May 2009, some 54,500 people in almost 300 businesses were on short-time working.

By contrast, almost no one was on short-time working a year ago.[16]

In view of the continued recession in 2009, a further severe deterioration in the labor market situation must be expected. So far, the manufacturing industry, in particular, has been hit by the rise in unemployment (mostly men from typical industrial regions and sectors with on average relatively poorer education). Over the forecast horizon, however, this phenomenon is expected to have a knock-on effect on other sectors of the economy. Since employment follows on the heels of economic growth, employment growth will shrink by 1.5% in 2009 and 1.6% in 2010 (2008: +1.6%) and only stabilize in 2011. Since labor supply growth is also sensitive to cyclical changes in the economy, it will fall from +1.3% in 2008 by −0.1% in 2009 and by −0.5% in 2010. This situation will counter the rise in unemployment to some extent. Even in 2011, however, GDP growth will remain too sluggish to reduce unemployment. According to the OeNB, the unemployment rate is consequently projected to rise to 5.3% in 2009, 6.5% in 2010 and 6.6% in 2011. After a decline in unemployment numbers of some 4,000 persons in 2008, the number of unemployed will increase by a total of almost 140,000 persons in the period from 2009 to 2011.

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[16] *Short-time working could be seen as "part-time unemployment": enterprises cut their working hours and thus pay their employees lower wages and salaries. If an employer's application for a short-time working grant is approved by the AMS, the employees will receive financial assistance from the AMS, the amount of which is equal to pro-rata unemployment benefits. In the wake of the current economic crisis, the potential duration of short-time working was increased from six months to 18 months. The reduction in working hours, which is funded by the AMS, can range from 10% to 90% of normal working hours. According to information provided by the AMS, the average reduction in working hours is currently 30%. Since the reduction in wages is less than the reduction in working hours, short-time working actually results in increased hourly pay.*

Table 8

Labor Market Developments in Austria

	2008	2009	2010	2011
	Annual change in %			
Total employment	+1.6	−1.5	−1.6	+0.1
of which: Payroll employment	+1.9	−1.3	−1.6	+0.1
Self-employment	−0.2	−2.3	−2.0	−0.1
Public sector employment	+0.5	+0.1	+0.0	−0.1
Registered unemployment	−2.8	+36.8	+18.3	+1.6
Labor supply	+1.3	−0.1	−0.5	+0.1
	% of labor supply			
Unemployment rate (Eurostat definition)	3.8	5.3	6.5	6.6

Source: 2008: Eurostat; 2009 to 2011: OeNB June 2009 outlook.

4.6 Sharp Fall in Commodity and Energy Prices Triggers Drop in Inflation

In 2008, HICP inflation was driven primarily by rocketing oil and commodity prices worldwide (+3.2%). Since then basis effects and the global downturn, as well as related low market expectations about future energy price trends, have had a clearly negative impact on inflation. As a result, the OeNB expects inflation to be only 0.4% in 2009. In 2010, HICP inflation will climb to 1.1% and tick up to a modest 1.2% in 2011.

The sharp rise in commodity prices worldwide led to a pronounced deterioration in the terms of trade in 2008 (−2.4%). However, the latter are expected to worsen only slightly in 2009 (−0.9%) before stabilizing in 2010 and 2011.

Wage negotiations for 2010 will be determined by the current slump and the anticipated narrowing of profit margins in 2009. According to the

Table 9

Selected Price and Cost Indicators for Austria

	2008	2009	2010	2011
	Annual change in %			
Harmonised Index of Consumer Prices (HICP)	+3.2	+0.4	+1.1	+1.2
HICP energy	+10.7	−12.9	+1.3	+2.7
HICP excluding energy	+2.5	+1.7	+1.1	+1.1
Private consumption expenditure (PCE) deflator	+2.9	+0.5	+0.9	+1.2
Investment deflator	+4.4	−0.1	+0.7	+1.5
Import deflator	+3.6	+0.6	+0.3	+1.2
Export deflator	+1.2	−0.4	+0.6	+1.2
Terms of trade	−2.4	−0.9	+0.2	+0.0
GDP at factor cost deflator	+2.3	−0.3	+0.6	+1.4
Unit labor costs	+2.9	+4.9	−1.0	+0.0
Compensation per employee	+3.0	+2.1	+0.3	+1.1
Labor productivity	+0.1	−2.7	+1.3	+1.1
Collectively agreed wage settlements	+3.1	+3.2	+1.0	+1.5
Profit margins[1]	−0.5	−5.2	+1.6	+1.5

Source: 2008: Eurostat, Statistics Austria; 2009 to 2011: OeNB June 2009 outlook.

[1] GDP deflator divided by unit labor costs.

OeNB, wages will therefore rise at only a very modest 1.0%.[17] Collective wage agreements for 2011 are expected to be somewhat higher (1.5%). Although unit labor costs will soar in 2009 owing to the economic downturn and relatively high wage settlements for 2009 (+4.9% after +2.9% in 2008), they will plummet in 2010 (–1.0%) before stabilizing in 2011. Profit margins will narrow – significantly – by 5.2% in 2009 but widen marginally in the years thereafter (2010: +1.6%, 2011: +1.5%).

Box 3

Impact of Monetary and Fiscal Policy Measures

Both monetary and fiscal policymakers have responded to the current financial and economic crisis with expansionary measures. Although influencing real economic growth via the key policy rate ("interest rate channel") is only one of many avenues of monetary policy, it is one of the most important for the euro area economy. This box focuses on the impact of changes to the key policy rate and then presents a table summarizing the impact on GDP growth from current monetary and fiscal policy measures.
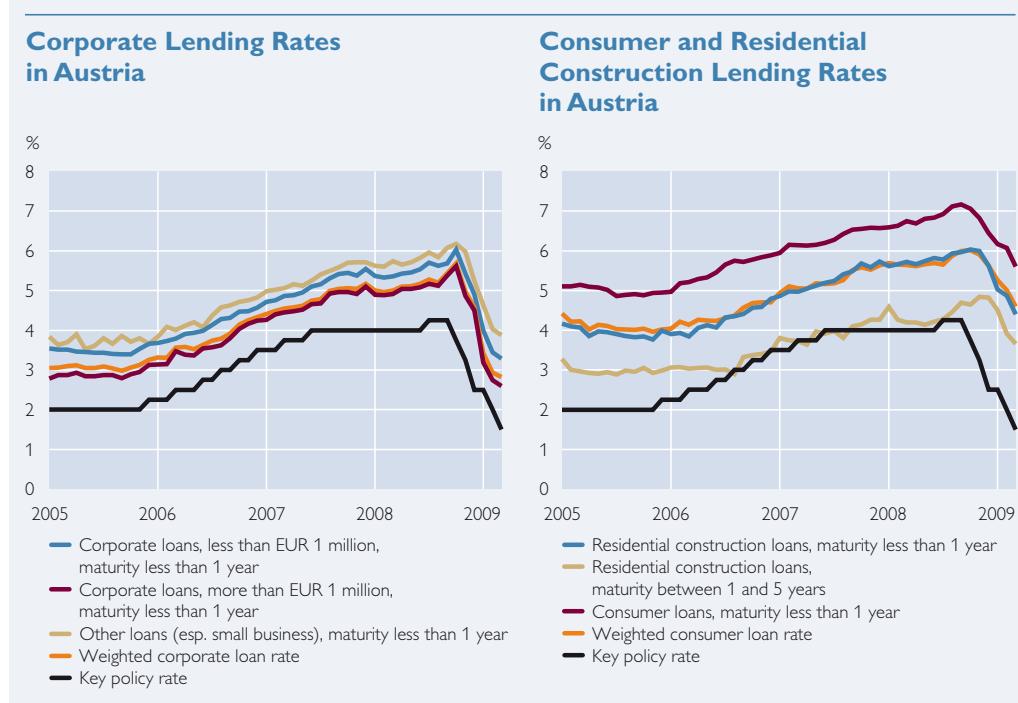
In Austria, bank loans are a key source of financing for enterprises and households. With the outbreak of the financial crisis, corporate financing via the capital market became more difficult and bank loans more important. Since bank loans thus enjoy a special status in the interest rate channel, an analysis of rate developments for newly issued loans in Austria is presented below. This analysis makes a distinction between corporate and household loans. Of newly raised bank loans, corporate loans account for around 85%, while the remaining 15% are issued to households.[1]

The OeNB's interest rate statistics break down small (less than EUR 1 million) and large (more than EUR 1 million) corporate loans, as well as loans to small businesses by their maturity of rates.[2] The left chart below shows some representative rates from this group, which apply to over 90% of the relevant total lending volume, as well as the volume-weighted rate for all corporate loans. The corporate lending rates shown have been developing very similarly, closely following the Eurosystem's key policy rate. Between October 2008 and March 2009, the weighted average of all corporate lending rates fell by a similar order of magnitude as the key policy rate (by some 275 basis points).

[1] By contrast, corporate loans as a share of total loans issued account for two-thirds, while household loans make up the remaining one-third.

[2] This breakdown includes under corporate loans consumer loans for other purposes, as this category is dominated by loans to small businesses.

[17] *This analysis is based on both the time pattern of wage negotiations and the system of wage leadership implicitly practiced in Austria. The wage leadership role is exercised by the metal working industry, where only marginal wage increases can be expected since the industry is particularly affected by the current crisis. Since collective wage negotiations are conducted at an industry-wide level in Austria, wage increases only slightly above projected inflation look likely.*

**Corporate Lending Rates
in Austria**

%

- Corporate loans, less than EUR 1 million,
  maturity less than 1 year
- Corporate loans, more than EUR 1 million,
  maturity less than 1 year
- Other loans (esp. small business), maturity less than 1 year
- Weighted corporate loan rate
- Key policy rate

**Consumer and Residential
Construction Lending Rates
in Austria**

%

- Residential construction loans, maturity less than 1 year
- Residential construction loans,
  maturity between 1 and 5 years
- Consumer loans, maturity less than 1 year
- Weighted consumer loan rate
- Key policy rate

Source: OeNB, Thomson Reuters.

As for household loans, they are broken down by consumer loans and residential construction loans, as well as by maturities of rates. Here too, the right chart above shows some representative rates from this group and a weighted average of all household lending rates. This group of lending rates is based less closely on the key policy rate as a rule. As Jobst and Kwapil (2008) show, in the short term, rates are passed on to household loans to a much smaller extent than to corporate loans. Accordingly, household lending rates are currently also falling at a much slower pace. While the key policy rate between October 2008 and March 2009 fell by 275 basis points, the weighted average of household lending rates decreased by only some 140 basis points. This slow adjustment is in line with the historical correlation, which remains applicable despite the unusual circumstances of the current economic crisis. In the long term, changes to the key policy rate were fully passed on to household loans, albeit at a slower pace than for corporate loans.

The impact on Austrian GDP growth by the ECB's interest rate cuts was simulated using a macroeconomic model (projection update elasticities − PUEs), which includes not only the direct effects of interest rate changes on Austria but also the effects with an indirect impact on Austria via the other euro area countries. Compared with the basic solution, furthermore, a ceteris paribus cut in the short-term interest rate of 275 basis points was implemented, which is realized within two quarters and remains in place until the end of the forecast horizon.

The results of this simulation and the fiscal policy effects (described in Köhler-Töglhofer and Reiss, 2009) are presented in the table below. According to this table, monetary and fiscal policy measures will fuel Austrian GDP growth by some 1.1% in 2009 and around 2¼% in 2010. These simulation results are subject to various upside and downside risks, which are not precisely quantifiable. Stronger effects can be expected, as neither fiscal policy measures outside Austria and their impact nor the effects of interest rate cuts outside the euro area, which also have an effect on Austria by increasing demand, were included. Weaker effects can arise should a relatively larger share of additional disposable income be saved or if the banking sector offsets falling rates by increasing risk-related fees.

GDP and Employment Effects of Fiscal and Monetary Policy

Effects of Economic Stimulus Measures and the Tax Reform (Fiscal Policy)

	Volume (EUR million)		Employment[1] (persons)		GDP (% of basic solution)	
	2009	2010	2009	2010	2009	2010
Consumer stimulus measures	4,360	4,460	9,312	17,840	0.6	0.9
Investment incentives and export promotion	1,395	1,385	590	1,079	0.0	0.1
Investment in infrastructure	580	745	2,698	6,299	0.2	0.3
Employment promotion[1]	275	275	×	×	0.0	0.1
Total	6,610	6,865	12,600	25,218	0.8	1.4

Effects of Interest Rate Cuts by the ECB (Monetary Policy)

	Amount (basis points)		Employment (persons)		GDP (% of basic solution)	
	2009	2010	2009	2010	2009	2010
Key policy rate cuts	−244	−275	3,738	16,051	0.2	0.9

Total Monetary and Fiscal Policy Measures

	Employment (persons)		GDP (% of basic solution)	
	2009	2010	2009	2010
	16,337	41,270	1.1	2.3

Source: Federal Ministry of Finance, OeNB.

[1] *Employment effects of short-time working and of the job-creation initiative are currently not quantifiable.*

Note: Fiscal simulation using the OeNB macromodel (AQM). Volume per year (compared with 2007), effects on employment and GDP are shown cumulatively. Assumption: no anticipation effects of the tax reform. Monetary policy simulation with PUEs. Assumption: all other variables remain constant.

5 Unusually High Risks to Growth Outlook

The current OeNB outlook is subject to a large number of *unusually high risks,* the source of which remains future external economic developments. Both the scale and duration of these developments are currently extremely uncertain.

Of the *external assumptions,* on which this outlook is based, primarily the projected growth trend of Austria's trading partners exhibits the greatest degree of uncertainty – both in upside and downside terms. This uncertainty relates, above all, to the extent of the recession in 2009 but – and this point is even more important for real economic developments in Austria – also to its scale in the years to follow. All other external assumptions of this outlook (oil prices, interest rates, etc.) are far more heavily dependent on the development of the global economy compared with previous forecasts. For instance, the price of oil depends on expectations about future economic developments. At the cutoff date of data for this publication, futures indicated only a slight rise in oil prices in 2010 and 2011, from which deviations can represent either an upside or a downside risk. Likewise, exchange rate developments can be considered as upside or downside risk depending on the economic trend.

A material *domestic downside risk* is a stronger than expected negative retroactive effect of the economic crisis on the banking sector's profitability. A *domestic upside risk* for 2010 is higher wage settlements, which can give rise to rela-

tively stronger stimulation of consumer demand. The effects on consumption from measures to support the economy and from the tax reform can prove to be either stronger or weaker than expected. At the time this outlook was prepared, furthermore, a relatively strong rally by Austria's stock market indicated a more robust recovery of Austrian industry than factored into this outlook.

Overall, the risks to the growth outlook *do not clearly point in one direction.* Since inflation risks are closely related to real economic ones, a clear upside or downside risk does not exist for the inflation outlook either.

6 Noticeably Sharp Forecast Revision Compared with December 2008

External economic conditions have deteriorated markedly since the previous OeNB economic outlook (December 2008). Growth in external demand for Austrian exports experienced a huge implosion in early 2009. Compared with the December 2008 economic outlook, it is downgraded by 13.8 percentage points to −12.4% for 2009. The assumptions for the future development of oil prices were corrected down by USD 12.8 and USD 11.1 per barrel (Brent). The short-term interest rate is 1.4 percentage points (2009) and 1.6 percentage points (2010) lower than in

Table 10

Change in the External Economic Conditions since the OeNB December 2008 Outlook

	June 2009			December 2008		Difference	
	2009	2010	2011	2009	2010	2009	2010
Annual change in %							
Growth of Austria's export markets	−12.4	+0.1	+3.6	+1.4	+4.5	−13.8	−4.4
Competitor prices in Austria's export markets	−2.5	−0.1	+0.7	+3.4	+1.3	−5.9	−1.4
Competitor prices in Austria's import markets	−2.5	−0.1	+0.7	+2.8	+1.3	−5.3	−1.4
USD							
Oil price per barrel (Brent)	54.5	65.5	70.3	67.3	76.6	−12.8	−11.1
Annual change in %							
Nominal effective exchange rate (exports)	−0.4	+0.1	+0.0	+1.4	+0.0	−1.8	+0.1
Nominal effective exchange rate (imports)	−0.7	+0.1	+0.0	+0.7	+0.0	−1.4	+0.1
%							
Three-month interest rate	1.4	1.6	2.5	2.8	3.2	−1.4	−1.6
Long-term interest rate	4.2	4.6	5.0	4.5	4.7	−0.3	−0.1
Annual change in %							
U.S. GDP (real)	−3.3	+0.3	+1.6	−0.7	+0.9	−2.6	−0.6
USD/EUR							
USD/EUR exchange rate	1.33	1.34	1.34	1.27	1.27	+0.06	+0.07

Source: Eurosystem.

the December 2008 outlook. The nominal effective exchange rate for both exports and imports is lower in 2009, compared with the December 2008 outlook. The USD/EUR exchange rate remained almost unchanged.

The effects of these new external assumptions were simulated using the OeNB macroeconomic model. The two years of the forecasting period will see significantly negative effects on GDP growth: −0.8 percentage points in 2009 and –2.0 percentage points in 2010. The mostly favorable developments on the economy's price front are clearly too sluggish to counter the negative effects on real activity. Table 11 lists in detail the reasons for revising the outlook (effects of these new external assumptions, effects of new data and the item "Other"). The influence of new data includes the effects of the revisions of both the historical data already available at the time of the previous OeNB economic outlook (i.e. data to the third quarter of 2008) and the forecasting errors of the previous outlook for the periods now published for the first time (i.e. data for the fourth

quarter of 2008 and for the first quarter of 2009). The item "Other" includes new expert assessments regarding the development of domestic variables, such as government consumption or wage settlements, as well as any changes to the model.

The downgrade of the *growth outlook* for 2009 by 3.9 percentage points is basically attributable to the negative effects of the external assumptions (−0.8 percentage points) and the effects of new data (–2.6 percentage points). The effects of revised historical data (−0.1 percentage points) are significantly smaller than those of preliminary values for the fourth quarter of 2008 and, in particular, for the first quarter of 2009 (a total of –2.6 percentage points). It should not be forgotten however that these quarterly values were also largely generated by negative external developments. The new expert assessment for 2009 (–0.4 percentage points) is derived from a somewhat more negative economic assessment on the basis of current leading indicators and new data regarding the development of the expenditure side of GDP

Table 11

Breakdown of Forecast Revisions

	GDP		HICP	
	2009	2010	2009	2010
Annual change in %				
June 2009 outlook	−4.2	−0.4	+0.4	+1.1
December 2008 outlook	−0.3	+0.8	+1.4	+1.6
Difference	−3.9	−1.2	−1.0	−0.5
Percentage points				
Due to:				
External assumptions	−0.8	−2.0	−0.1	+0.0
New data	−2.6	+0.0	−0.8	+0.0
of which: Revision of historical data until Q3 08	−0.1	x	−0.1	x
Projection errors for Q4 08 and Q1 09	−2.6	+0.0	−0.7	+0.0
Other[1]	−0.4	+0.8	−0.1	−0.5

Source: OeNB December 2008 and June 2009 outlooks.

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

based on the latest publication of the national accounts. The effects of the new expert assessment for 2010 (+0.8 percentage points) are notable. As would be expected at first glance, this new expert assessment does not reflect a clearly positive assessment for this year but is based on the very pessimistic assessment of the effects of the financial crisis contained in the December 2008 outlook and, in this instance, particularly of export and investment activities, which is now included in the external assumptions.

The revision of the inflation outlook for 2009 (–1.0 percentage point) was largely prompted by fresh data. New assumptions (–0.1 percentage points) and a new expert assessment play only a secondary role (–0.1 percentage points). The revision for 2010 is essentially based on a new expert assessment. Owing to the great openness of the Austrian economy, the huge implosion of domestic demand will have only a relatively mild effect on the trend in inflation.

A comparison of the current forecasts for Austria (table 18 in the annex) shows clear differences in the forecast results. As in the OeNB December 2008 economic outlook, the forecasts correlate with the time of publication, and an even more pronounced downgrade trend is visible. With its growth outlook for 2009 (–4.2%), the OeNB is at the bottom end of the forecast spectrum. The European Commission outlook, however, is similarly pessimistic (–4.0%). The IMF outlook for 2009 was somewhat more "optimistic" (–3.0%). The WIFO and IAS outlooks (2009: –2.2% and –2.7%, respectively) are still based on a relatively old data situation. The growth outlooks for 2010 differ less than those for 2009 but, even in this instance, the OeNB (–0.4%) and the European Commission (–0.1%) are at the bottom end of the forecast spectrum. All other institutions projected modest growth in 2010.
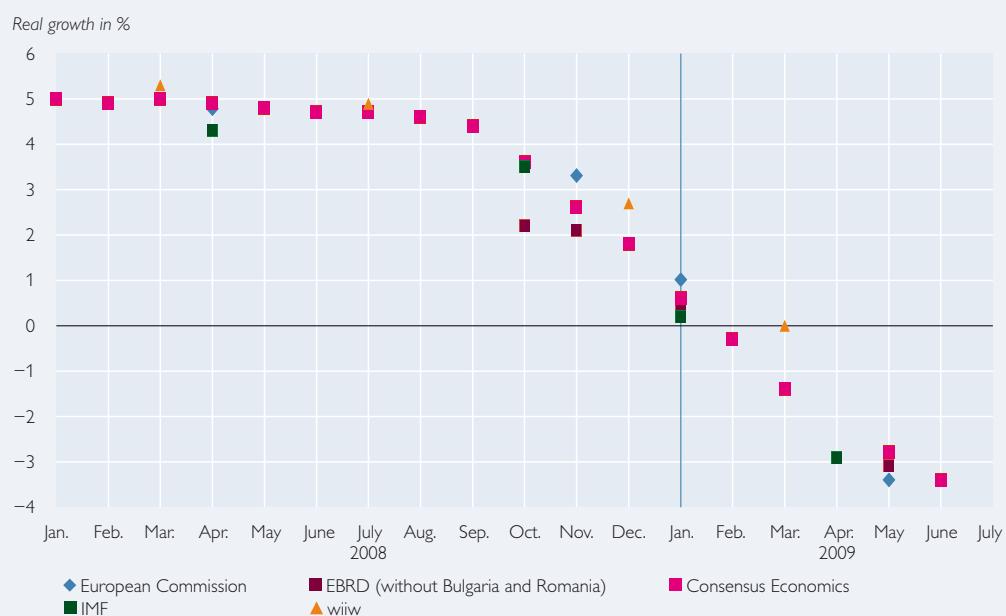
Box 4

Outlook for Selected Central and Eastern European (CEE) Countries[1, 2]
Region not immune against the global downturn: 2009 will bring stagnation in Poland and recession in the Czech Republic, Hungary and Russia; comparatively moderate recovery in 2010 hinges strongly on improvement of external demand

Since the fall of 2008, the global financial crisis has intensified markedly, risk aversion has risen substantially, especially vis-à-vis emerging economies, and the repercussions of the crisis on the real economy have magnified very strongly across the globe. Alongside, all forecasting institutions undertook repeated and very substantial downward revisions of growth projections world-wide. While forecasters had already started to moderately reduce their growth projections for the U.S.A. and the euro area since the beginning of 2008, projections for CESEE[3] countries remained broadly unchanged or were even revised upwards in the case of Russia until August/ September 2008, but then declined sharply thereafter. The positive growth differential of about 3 percentage points between CESEE and the euro area, which has been observed for many years, is no longer visible in current projections. For 2009 and 2010, the growth differential between these two regions could be around 1 percentage point.

CESEE EU Members: Development of Growth Projections for 2009

Real growth in %

◆ European Commission   ■ EBRD (without Bulgaria and Romania)   ■ Consensus Economics
■ IMF   ▲ wiiw

Source: European Commission, EBRD, Consensus Economics, IMF, wiiw.

[1] *Compiled by Julia Wörz (julia.woerz@oenb.at).*

[2] *The OeNB and the Bank of Finland (BoF) compile semiannual forecasts of economic developments in the Czech Republic, Hungary, Poland and Russia, with the OeNB being in the lead with respect to the projections for the three Central European countries and the BoF in charge of the forecast for Russia. The forecasts are based on expert judgement and estimates of long-run elasticities. For the first time, the projections for the three Central European countries are also informed by country-specific IS-LM models, which are, though, still in the process of development. The forecast for Russia was prepared in cooperation with the Bank of Finland and is based on a structural VAR model. The forecasts are based on preliminary global growth projections and technical assumptions about euro area import growth, oil prices and USD/EUR exchange rates, which are prepared by the ECB for the Eurosystem in the context of broad macroeconomic projection exercises. Imports of the euro area are expected to shrink substantially in 2009 and to recover moderately thereafter. The price of oil will stay broadly stable in 2009 and is expected to rise slightly in 2010. The EUR/USD exchange rate is assumed to remain unchanged over the entire projection horizon at levels recorded at the end of March 2009.*

[3] *Central, Eastern and Southeastern Europe.*

In the fourth quarter of 2008 growth decelerated markedly. The development of important short-term activity indicators points to a further weakening of general economic dynamics in early 2009.

After having first turned negative in October 2008, industrial output growth contracted at an accelerating rate which reached −17.1% (year on year) in January 2009 on average in the CESEE area (Slovakia, Slovenia, Bulgaria, the Czech Republic, Hungary, Poland and Romania). Output declined at broadly comparable speed also in Russia and Turkey while a less pronounced reduction could be observed in Croatia. Currently, industrial production in CESEE contracts at rates comparable to the euro area, the deterioration was, however, more pronounced in CESEE countries, as industrial production growth in CESEE before the onset of the crisis had been higher than in the euro area.

The weakening of the industrial sector is also reflected in declining capacity utilization rates and worsening industrial sentiment. Both indicators continued their downward trend and reached long-time lows in recent months.

Overview of Projections for 2009 and 2010

	2008	2009				2010			
		OeNB-BoF	IMF	Euro-pean Com-mission	Con-sensus Eco-nomics	OeNB-BoF	IMF	Euro-pean Com-mission	Con-sensus Eco-nomics
		Apr. 09	Apr. 09	May 09	June 09	**Apr. 09**	Apr. 09	May 09	June 09
	%								
Czech Republic	3.2	**−2.3**	−3.5	−2.7	−3.3	**1.4**	0.1	0.3	1.1
Hungary	0.5	**−4.1**	−3.3	−6.3	−6.2	**−0.4**	−0.4	−0.3	−0.7
Poland	4.8	**−0.1**	−0.7	−1.4	0.1	**1.7**	1.3	0.8	1.7
Russia	5.6	**−2.0**	−6.0	×	−5.0	**1.0**	0.5	×	2.4

Sources: OeNB, Bank of Finland (BoF), IMF, European Commission, Consensus Economics.

The household sector, in turn, has been less affected than industry so far. The growth of retail sales turned negative in December 2008 and reached −1.4% in February 2009 on average in the EU Member States (without the Baltic states). The latest data available for Croatia and Russia show that retail sales still expanded in December (comparable data for Turkey are not available). While retail sales in the euro area contracted somewhat stronger in February, the deceleration over the past months was again more pronounced in CESEE. Consumer sentiment continued its downward trend, reaching levels which were even below industrial sentiment by March. Unemployment rates have been slowly increasing in all CESEE countries in early 2009, thus lagging developments in a number of euro area countries where unemployment has recently soared.

Export orders in the region had fallen far below long-term average levels (comparable data for Croatia, Russia and Turkey are not available) by the end of 2008 and continued to go down in early 2009, which shows that external demand conditions in key export markets, including the euro area − which accounts for more than 50% of all CESEE exports −, have worsened further most recently. Export expectations have also declined markedly in early 2009 and reached negative levels in all countries, which means that a majority of exporters expect export orders to decline in the coming months.

The new OeNB-BoF projections were completed in early April 2009[4] and cover the three largest EU members in Eastern Europe − the Czech Republic, Hungary, Poland (which represent

[4] *Cutoff date: April 3, 2009.*

more than 60% of the CESEE EU members' GDP) – and Russia. For all economies alike, the main growth drivers of recent years are dysfunctional at the moment: Much stiffer financing conditions as a result of the financial crisis and receding foreign capital inflows are weighing on the growth outlook. As a consequence domestic demand has suffered considerably in recent months. Domestic demand upholds relatively well in Poland and is likely to react to stimuli from economic support programs in the Czech Republic and Russia. No room for such measures is currently available in Hungary. Some revival can be expected to come from EU-funded investment projects and the catching-up process, which has been slowed substantially by the crisis but will continue thereafter. An upswing in Central Europe is expected to rely strongly on a recovery of external demand, which is assumed to gradually get going again in 2010. For Russia, oil price developments remain key to the growth outlook.

The highly export-oriented **Czech Republic** is being hit strongly by the current bust in the automotive industry. Private consumption and investment will suffer given the unprecedented drop of confidence indicators over the last half year, an expected marked rise in unemployment and stiff financing conditions. Nevertheless, the negative impact on both private consumption and gross fixed capital formation will be alleviated by significant monetary and fiscal stimuli. Although net exports will certainly suffer from plunging import demand in the euro area so that a substantial contraction seems inevitable, the impact will be alleviated by massive fiscal measures in the euro area (particularly in the automotive sector) and also by the recently depreciated Czech koruna.

Against the backdrop of the assumed strengthening of external demand, net exports are expected to contribute positively to growth in 2010. Growth will also be supported by some revival of domestic demand. While public consumption growth will likely decelerate, private consumption is likely to pick up. Given continued tight financing conditions, we expect investment to stay broadly flat in 2010.

The global economic crisis reached **Hungary** when the country was already experiencing difficult times. Given the global growth outlook and a new wave of domestic fiscal tightening measures – which are in line with the commitments made in connection with the international financial support provided by the IMF and the EU[5] – GDP is projected to decline strongly in 2009. Private consumption will likely remain weak due to moderate wage growth (both in the private and the public sector), tightened financing conditions, reductions in transfers and savings measures in the pension system. Fiscal restraint will also hamper public investments. The bleak economic outlook, deteriorated financing conditions and a declining profitability of the corporate sector will lead to a projected decline in investment. With receding FDI, EU-funded projects will likely constitute the main pillar of investment. Exports will contract sharply in 2009 and the recent depreciation of the Hungarian forint cannot give the much-needed export stimulus, but puts additional pressure on the balance sheets of unhedged borrowers who have taken out foreign currency loans.

For 2010, based on the assumption of strengthening external demand, net exports will again contribute positively to growth but not outweigh a projected further decline in domestic demand, while public consumption and investments will still decline. Hence, no growth impetus can be expected from domestic factors for 2010, and the revival of external demand will not be sufficient to lead to a recovery.

The economy of **Poland** is expected to stagnate in 2009 and to start growing again in 2010. In 2009, private consumption will remain the main pillar of growth, with its growth rate remaining positive, but considerably smaller than in 2008. While consumer sentiment has already deteriorated markedly, the impact of the crisis on employment and retail sales will continue to drag somewhat behind the development in investment, exports and industrial output. The Polish economy will see a marked contraction of fixed investment given the negative sales outlook, considerably higher unit labor costs, tighter lending conditions of banks and reduced

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[5] For detailed information on the package see: www.imf.org/external/country/HUN/index.htm

access to cross-border loans as well as due to funding and home market problems of foreign parent companies. While the budget envisages enhanced public investment (as a fiscal stimulus), such spending plans were always underexecuted in previous years. Given the deterioration in all three major final demand components, imports will fall even more than exports, thus putting the contribution of net exports to GDP growth in positive territory.

For 2010, on the basis of the assumptions for foreign demand, a stabilization of exports, some moderate recovery in investment growth and constant subdued private consumption growth are expected, which will experience the upswing probably only with some delay. The investment-driven recovery will imply import growth exceeding export growth.

*The forecast for **Russia** has been substantially scaled down in the wake of a massive deterioration in the external environment. The crash in oil prices is markedly squeezing domestic incomes, and capital can no longer be obtained from the international markets. Private consumption growth, largely driven by the trickle-down effects of oil and staple revenues, is slowing substantially and projected to decline slightly in 2009, owing to weaker wage developments and rising layoffs and unemployment. Given the authorities' sizable anti-crisis measures already put in place and anti-cyclical fiscal policy, public consumption is projected to cushion the decline somewhat. Moreover, as Russian households are not highly indebted, there should be room for recovery of private consumption in 2010. Investment is estimated to decline markedly. Weak international demand is having a modest contractionary effect on export volumes. Import volumes will decline much more dramatically, in line with the depreciation of the ruble and soft demand.*

As for risks to these projections, Russia's economic outlook depends heavily on what happens in the world economy through both oil prices and financial market developments. If the world economic crisis lasts longer and deepens, the price of oil falls further, and financial markets remain in the doldrums, the situation in Russia will worsen. A renewed sustained deterioration of Russia's terms of trade would increase the downward pressure on the ruble and further destabilize the banking sector and the economy. Shrinking purchasing power due to a weaker ruble, high inflation, and declining incomes could also set off popular unrest. In a worst plausible case, Russia's economic performance would be way below the one forecast here. Alternatively, a swift recovery of the world economy and a bouncing back of the oil price could set the stage for an above-forecast economic performance.

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Annex: Detailed Result Tables

Table 12

Demand Components (Real Prices)

Chained volume data (reference year = 2000)

	2008	2009	2010	2011	2008	2009	2010	2011
	EUR million				Annual change in %			
Private consumption	128,367	127,928	127,955	128,559	+0.9	−0.3	+0.0	+0.5
Government consumption	43,828	43,792	43,943	44,347	+2.0	−0.1	+0.3	+0.9
Gross fixed capital formation	54,537	49,376	47,896	48,434	+0.9	−9.5	−3.0	+1.1
of which: Investment in plant and equipment	21,999	18,635	17,252	17,575	+2.3	−15.3	−7.4	+1.9
Residential construction investment	10,756	10,694	10,687	10,703	−0.2	−0.6	−0.1	+0.2
Investment in other construction	22,598	22,103	21,939	22,156	+2.9	−2.2	−0.7	+1.0
Changes in inventories (including statistical discrepancy)	1,448	1,098	1,173	1,119	×	×	×	×
Domestic demand	228,180	222,195	220,967	222,459	+1.0	−2.6	−0.6	+0.7
Exports of goods and services	152,796	139,212	138,294	143,097	+2.5	−8.9	−0.7	+3.5
Imports of goods and services	135,896	126,680	125,430	128,999	+1.3	−6.8	−1.0	+2.8
Net exports	16,900	12,532	12,865	14,097	×	×	×	×
Gross domestic product	245,081	234,727	233,831	236,556	+1.7	−4.2	−0.4	+1.2

Source: 2008: Eurostat; 2009 to 2011: OeNB June 2009 outlook.

Table 13

Demand Components (Current Prices)

	2008	2009	2010	2011	2008	2009	2010	2011
	EUR million				Annual change in %			
Private consumption	149,245	149,412	150,849	153,443	+3.7	+0.1	+1.0	+1.7
Government consumption	50,141	51,351	52,043	53,047	+2.6	+2.4	+1.3	+1.9
Gross fixed capital formation	63,155	57,108	55,796	57,267	+5.3	−9.6	−2.3	+2.6
Changes in inventories (including statistical discrepancy)	4,504	2,635	1,586	2,253	×	×	×	×
Domestic demand	267,044	260,506	260,273	266,010	+4.8	−2.4	−0.1	+2.2
Exports of goods and services	166,934	151,563	151,399	158,507	+3.6	−9.2	−0.1	+4.7
Imports of goods and services	152,001	142,491	141,483	147,223	+5.0	−6.3	−0.7	+4.1
Net exports	14,933	9,072	9,916	11,283	×	×	×	×
Gross domestic product	281,977	269,578	270,189	277,294	+4.1	−4.4	+0.2	+2.6

Source: 2008: Eurostat; 2009 to 2011: OeNB June 2009 outlook.

Table 14

Deflators of Demand Components

	2008	2009	2010	2011	2008	2009	2010	2011
	2000 = 100				Annual change in %			
Private consumption	116.3	116.8	117.9	119.4	+2.9	+0.5	+0.9	+1.2
Government consumption	114.4	117.3	118.4	119.6	+0.7	+2.5	+1.0	+1.0
Gross fixed capital formation	115.8	115.7	116.5	118.2	+4.4	−0.1	+0.7	+1.5
Domestic demand (excluding changes in inventories)	115.8	116.6	117.7	119.2	+2.8	+0.7	+0.9	+1.2
Exports of goods and services	109.3	108.9	109.5	110.8	+1.2	−0.4	+0.6	+1.2
Imports of goods and services	111.9	112.5	112.8	114.1	+3.6	+0.6	+0.3	+1.2
Terms of trade	97.7	96.8	97.1	97.1	−2.4	−0.9	+0.2	+0.0
Gross domestic product	115.1	114.8	115.5	117.2	+2.3	−0.2	+0.6	+1.4

Source: 2008: Eurostat; 2009 to 2011: OeNB June 2009 outlook.

Table 15

Labor Market

	2008	2009	2010	2011	2008	2009	2010	2011
	Thousands				Annual change in %			
Total employment	4,229.4	4,164.8	4,096.9	4,100.5	+1.6	−1.5	−1.6	+0.1
of which: Private sector employment	*3,707.8*	*3,642.8*	*3,575.0*	*3,579.1*	*+1.7*	*−1.8*	*−1.9*	*+0.1*
Payroll employment (national accounts definition)	3,547.6	3,503.2	3,448.7	3,453.3	+1.9	−1.3	−1.6	+0.1
	% of labor supply							
Unemployment rate (Eurostat definition)	3.8	5.3	6.5	6.6	×	×	×	×
	EUR per real output unit x 100							
Unit labor costs (whole economy)[1]	66.6	69.9	69.3	69.3	+2.9	+4.9	−1.0	+0.0
	EUR thousand per employee							
Labor productivity (whole economy)[2]	57.9	56.4	57.1	57.7	+0.1	−2.7	+1.3	+1.1
	EUR thousand							
Real compensation per employee[3]	33.2	33.7	33.5	33.5	+0.1	+1.6	−0.6	−0.2
	At current prices, EUR 1.000							
Gross compensation per employee	38.6	39.4	39.5	40.0	+3.0	+2.1	+0.3	+1.1
	At current prices, EUR million							
Total gross compensation of employees	136,998	138,063	136,327	137,972	+4.9	+0.8	−1.3	+1.2

Source: 2008: Eurostat; 2009 to 2011: OeNB June 2009 outlook.

[1] Gross wages divided by real GDP.
[2] Real GDP divided by total employment.
[3] Gross wages per employee divided by the private consumption expenditure (PCE) deflator.

Table 16

Current Account

	2008	2009	2010	2011	2008	2009	2010	2011
	EUR million				*% of nominal GDP*			
Balance of trade	13,226.0	6,850.0	9,377.5	11,617.5	4.7	2.5	3.5	4.2
Balance on goods	−197.0	−1,901.5	−414.8	862.7	−0.1	−0.7	−0.2	0.3
Balance on services	13,423.0	8,751.5	9,792.4	10,754.8	4.8	3.2	3.6	3.9
Euro area	32.0	−2,825.4	−2,737.1	−1,771.8	0.0	−1.0	−1.0	−0.6
Non-euro area countries	13,194.0	9,675.4	12,114.6	13,389.3	4.7	3.6	4.5	4.8
Balance on income	−2,238.0	−2,550.0	−2,200.0	−2,400.0	−0.8	−0.9	−0.8	−0.9
Balance on transfers	−1,170.0	242.4	182.4	0.0	−0.4	0.1	0.1	0.0
Current account	9,818.0	4,542.4	7,359.9	9,217.5	3.5	1.7	2.7	3.3

Source: 2008: Eurostat; 2009 to 2011: OeNB June 2009 outlook.

Table 17

Quarterly Outlook Results

	2009	2010	2011	2009				2010				2011			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Prices, wages and costs	*Annual change in %*														
HICP	+0.4	+1.1	+1.2	+1.0	+0.1	−0.2	+0.8	+1.4	+1.2	+0.9	+0.9	+1.1	+1.1	+1.2	+1.3
HICP (excluding energy)	+1.7	+1.1	+1.1	+2.2	+1.7	+1.6	+1.5	+1.4	+1.3	+0.8	+0.8	+1.0	+1.0	+1.1	+1.2
Private consumption expenditure (PCE) deflator	+0.5	+0.9	+1.2	+1.3	+0.6	+0.2	−0.2	+0.5	+0.9	+1.1	+1.2	+1.2	+1.2	+1.2	+1.3
Gross fixed capital formation deflator	−0.1	+0.7	+1.5	+2.4	+1.1	−0.8	−3.1	+0.3	+0.6	+0.9	+1.1	+1.3	+1.4	+1.5	+1.7
GDP deflator	−0.2	+0.6	+1.4	+0.6	−0.3	−0.7	−0.4	+0.1	+0.4	+0.8	+1.1	+1.3	+1.4	+1.5	+1.6
Unit labor costs	+4.9	−1.0	+0.0	+5.8	+5.8	+4.8	+3.4	+0.4	−1.1	−1.6	−1.6	−1.0	−0.4	+0.4	+1.0
Nominal wages per employee	+2.1	+0.3	+1.1	+2.8	+2.4	+1.8	+1.3	+0.6	+0.2	+0.1	+0.2	+0.5	+0.9	+1.3	+1.6
Productivity	−2.7	+1.3	+1.1	−2.8	−3.3	−2.9	−2.0	+0.2	+1.4	+1.7	+1.8	+1.6	+1.2	+0.9	+0.6
Real wages per employee	+1.6	−0.6	−0.2	+1.4	+1.8	+1.6	+1.6	+0.1	−0.7	−1.0	−1.0	−0.6	−0.3	+0.0	+0.3
Import deflator	+0.6	+0.3	+1.2	−1.7	+3.6	+1.4	−1.0	+4.7	−1.2	−1.4	−0.9	+0.0	+0.8	+1.7	+2.1
Export deflator	−0.4	+0.6	+1.2	+0.4	+0.1	−0.1	−1.9	+0.5	+0.5	+0.6	+0.7	+0.9	+1.1	+1.3	+1.4
Terms of trade	−0.9	+0.2	+0.0	+2.1	−3.4	−1.4	−0.9	−4.1	+1.7	+2.0	+1.6	+0.8	+0.3	−0.4	−0.7
Economic activity	*Annual and/or quarterly changes in % (real)*														
GDP	−4.2	−0.4	+1.2	−2.8	−1.4	−0.5	−0.3	+0.0	+0.2	+0.2	+0.3	+0.3	+0.3	+0.3	+0.4
Private consumption	−0.3	+0.0	+0.5	−0.1	−0.3	−0.1	+0.0	+0.0	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1
Government consumption	−0.1	+0.3	+0.9	+0.4	−1.3	−0.7	−0.4	+0.6	+0.6	+0.5	+0.3	+0.1	+0.1	+0.1	+0.1
Gross fixed capital formation	−9.5	−3.0	+1.1	−4.4	−3.3	−2.0	−1.0	−0.4	−0.1	+0.0	+0.1	+0.3	+0.4	+0.5	+0.6
of which: Investment in plant and equipment	*−15.3*	*−7.4*	*+1.9*	*−7.0*	*−8.0*	*−4.7*	*−2.4*	*−1.1*	*−0.3*	*+0.0*	*+0.2*	*+0.4*	*+0.8*	*+0.9*	*+1.0*
Residential construction investment[1]	*−0.6*	*−0.1*	*+0.2*	*−0.1*	*−0.1*	*−0.1*	*−0.1*	*+0.0*	*+0.0*	*+0.0*	*+0.0*	*+0.0*	*+0.0*	*+0.1*	*+0.2*
Exports	−8.9	−0.7	+3.5	−4.4	−2.8	−0.9	−0.4	+0.0	+0.4	+0.6	+0.8	+0.9	+1.0	+1.0	+1.0
Imports	−6.8	−1.0	+2.8	−2.3	−2.2	−1.3	−0.5	−0.1	+0.3	+0.5	+0.6	+0.8	+0.8	+0.9	+0.9
	Contribution to real GDP growth in percentage points														
Domestic demand	−2.3	−0.6	+0.7	−1.0	−1.1	−0.6	−0.3	+0.0	+0.1	+0.1	+0.1	+0.1	+0.2	+0.2	+0.2
Net exports	−1.8	+0.1	+0.5	−1.4	−0.5	+0.2	+0.0	+0.0	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1	+0.1
Changes in inventories	−0.1	+0.0	+0.0	−0.4	+0.3	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0
Labor market	*% of labor supply*														
Unemployment rate (Eurostat definition)	5.3	6.5	6.6	4.4	5.1	5.6	6.0	6.3	6.5	6.6	6.7	6.7	6.7	6.5	6.4
	Annual and/or quarterly changes in %														
Total employment	−1.5	−1.6	+0.1	−1.0	−0.8	−0.6	−0.5	−0.4	−0.3	−0.2	−0.1	+0.1	+0.2	+0.2	+0.3
of which: Private sector employment	*−1.8*	*−1.9*	*+0.1*	*−1.2*	*−0.9*	*−0.6*	*−0.6*	*−0.5*	*−0.4*	*−0.2*	*−0.1*	*+0.1*	*+0.2*	*+0.3*	*+0.3*
Payroll employment	−1.3	−1.6	+0.1	−0.5	−0.7	−0.5	−0.4	−0.4	−0.4	−0.2	−0.1	+0.1	+0.2	+0.2	+0.3
Additional variables	*Annual and/or quarterly changes in % (real)*														
Disposable household income	+0.3	−0.5	+0.8	+1.2	+0.9	+0.4	+0.1	−0.4	−0.5	−0.4	−0.1	+0.4	+0.5	+0.5	+0.5
	% of real disposable household income (saving ratio) and % of real GDP (output gap)														
Household saving ratio	12.6	12.3	12.4	11.7	12.6	13.0	13.1	13.0	12.5	12.0	11.9	12.0	12.3	12.6	12.9
Output gap	−2.4	−3.2	−2.5	−0.9	−2.4	−3.0	−3.3	−3.4	−3.3	−3.2	−3.0	−2.8	−2.6	−2.4	−2.1

Source: OeNB June 2009 outlook (based on seasonally and working-day adjusted data).

[1] *Excluding other investment in construction and other investment.*

Table 18

Comparison of Current Economic Forecasts for Austria

Indicator	OeNB			WIFO		IAS		OECD		IMF		European Commission	
	June 2009			March 2009		March 2009		November 2008		April 2009		May 2009	
	2009	2010	2011	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
Key results	*Annual change in %*												
GDP (real)	−4.2	−0.4	+1.2	−2.2	+0.5	−2.7	+0.4	−0.1	+1.2	−3.0	+0.2	−4.0	−0.1
Private consumption (real)	−0.3	+0.0	+0.5	+0.4	+0.8	+0.4	+0.4	+0.2	+1.2	×	×	+0.1	+0.4
Government consumption (real)	−0.1	+0.3	+0.9	+0.5	+1.0	+0.3	+0.0	+0.9	+0.7	×	×	+0.6	+0.8
Gross fixed capital formation (real)[1]	−9.5	−3.0	+1.1	−5.1	+0.3	−6.3	−1.9	−3.1	+1.0	×	×	−11.6	+0.1
Exports (real)	−8.9	−0.7	+3.5	−5.6	+0.6	−7.9	+2.2	+1.0	+3.3	×	×	−10.9	+0.4
Imports (real)	−6.8	−1.0	+2.8	−4.2	+0.6	−6.2	+1.2	+0.6	+3.2	×	×	−9.5	+1.1
GDP per employee	−2.7	+1.3	+1.1	−0.9	+1.1	−1.4	+0.7	×	×	×	×	×	×
GDP deflator	−0.2	+0.6	+1.4	+1.4	+0.8	+1.5	+0.9	+1.7	+1.1	+0.9	+1.5	+1.4	+1.0
CPI	×	×	×	+0.6	+1.1	+0.9	+1.4	×	×	+0.5	+1.3	×	×
HICP	+0.4	+1.1	+1.2	+0.6	+1.1	×	×	+1.1	+0.8	×	×	+0.5	+1.1
Unit labor costs	+4.9	−1.0	+0.0	+4.0	+0.1	×	×	×	×	×	×	+4.1	+0.6
Payroll employment	−1.5	−1.6	+0.1	−1.2	−0.6	−1.3	−0.3	×	×	+0.5	+0.7	−2.7	−0.9
	% of labor supply												
Unemployment rate[2]	5.3	6.5	6.6	5.0	5.8	5.3	6.1	5.7	6.0	5.4	6.2	6.0	7.1
	% of nominal GDP												
Current account	1.7	2.7	3.3	1.6	1.3	×	×	3.7	4.0	1.3	1.3	2.7	2.4
Government surplus/deficit	−5.0	−6.3	−6.2	−3.5	−4.0	−3.3	−4.0	−2.7	−3.5	−3.5	−4.2	−4.2	−5.3
External assumptions													
Oil price in USD/barrel (Brent)	54.5	65.5	70.3	45.0	55.0	44.0	60.0	60.0	60.0	52.0	62.5	52.9	63.5
Short-term interest rate in %	1.4	1.6	2.5	1.7	2.0	1.3	1.2	2.7	2.6	1.6	2.0	1.6	2.0
USD/EUR exchange rate	1.33	1.34	1.34	1.25	1.25	1.30	1.30	1.25	1.25	1.31	1.31	1.32	1.33
	Annual change in %												
Euro area GDP (real)	−5.1 to −4.1	−1.0 to +0.4	×	−3.0	+0.0	−3.5	+0.5	−0.6	+1.2	−4.2	−0.4	−4.0	−0.1
U.S. GDP (real)	−3.3	+0.3	+1.6	−2.7	+0.5	−3.0	+1.0	−0.9	+1.6	−2.8	−0.0	−2.9	+0.9
World GDP (real)	−2.1	+1.7	+3.2	−1.0	+1.7	×	×	×	×	−1.3	+1.9	−1.4	+1.9
World trade	−13.3	+0.8	+4.2	−5.0	+3.0	−10.0	+3.5	+1.9	+5.0	−11.0	+0.6	−11.4	+0.9

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

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

Inflation Expectations –
Role and Measurement for Monetary Policy

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Inflation expectations play a crucial role in modern monetary policy, given their capacity to influence actual inflation and given their informative value on the central bank's credibility with regard to safeguarding price stability. The risk of a de-anchoring of inflation expectations in the wake of soaring energy and commodity prices figured among the key motivations for international hikes in official interest rates between 2007 and mid-2008. But also the recent abrupt decline in headline inflation – driven by the collapse in energy and commodity prices as well as the sharp global recession – may bear the risk of affecting inflation expectations, this time downward. An appropriate conceptualization and measurement – in real time – of inflation expectations is therefore essential for successful monetary policy.

Building on the current state of economic theory and central bank practice, this study addresses four questions: First, which agents' or sectors' inflation expectations should be considered? Second, what time horizon of inflation expectations is relevant for monetary policy decisions? Third, what are the relative merits and drawbacks of the various available measures of inflation expectations in the light of the answers to the first two questions? Finally, how do shocks to inflation expectations affect actual inflation in the euro area?

The study finds, first, that to gauge future risks for inflation and to assess central bank credibility comprehensively across various constituencies, it would be desirable to capture wage and price setters' inflation expectations better than so far. Second, besides the much-quoted long-term inflation expectations, also medium-term inflation expectations (beyond one and below five years) should be given due consideration. Third, the available empirical measures of inflation expectations only partly fit these conceptual requirements. Given the important limitations of the proxy measures currently available in the euro area, we recommend further research and improving data coverage.

Finally, the study confirms empirically that shocks to expected inflation account for a considerable part of actual inflation dynamics. The influence is stronger for financial market-based measures and for forecasters' inflation expectations than for measures based on consumer expectations. This may also reflect the longer time-horizon of these indicators. Thus, expectation shocks may represent a serious risk for price stability.

Inflation Expectations Are Central to Monetary Policy Decisions and Communication

Inflation expectations have moved center stage in recent central bank policy thinking and communication. This reflects, *first*, the current theoretical understanding of inflation formation embodied in the New-Keynesian Phillips curve, which sees a key role for inflation expectations in the shaping of current inflation and which is also confirmed by empirical studies for the U.S.A. and the euro area. Accordingly, inflation expectations are also embodied in state-of-the-art macroeconomic forecasting models used by central banks and other economic think tanks. *Second*, well-anchored low inflation expectations are widely regarded as an important indicator of a central bank's credibility regarding its price stability commitment.

Inflation expectations gain special prominence in periods of sharp swings in inflation and economic activity. The

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energy and commodity price shock between 2005 and mid-2008 caused a marked rise in actual inflation. Since the inflationary impact was drawn out over an extended period due to a sequence of price shocks, it was widely feared that this would trigger a rise in inflation expectations. As a result, central banks worldwide raised official rates to keep inflation expectations anchored at a low and stable level.

A similar line of argument applies also to an undershooting of headline inflation resulting, for instance, from a sharp fall in commodity and energy prices, or from a deep, protracted recession. If actual inflation is below target over a protracted period, expectations may adjust to this lower level. In the extreme, deflation can become self-reinforcing via expectations of falling aggregate demand, rising unemployment, falling asset prices and persistent positive real interest rates (Gnan, 2009).

Importantly, inflation expectations may overreact to shocks. "Exaggerated" or "unreasonable" inflation – or deflation – expectations, which may result e.g. from misperceptions or forecasting errors, may become an independent source of macroeconomic shocks and instability. Poor expectations management by central banks can therefore entail macroeconomic instability (ECB, 2009b).

While the importance of well-anchored inflation expectations and professional management of inflation expectations over the cycle is generally acknowledged and well documented by both economic theory and central bank practitioners, much less thought has been invested in questions related to the appropriate measurement of inflation expectations.

Chart 1 presents a typical collection of inflation expectations indicators used by policy makers, central bank watchers and economic and financial analysts. The chart highlights a number of issues: First, there are many indicators of inflation expectations (in fact, only a fraction of all available indicators is shown in the chart). Second, measures are based on three broad sources of information: surveys among economic agents (consumers or businesses); surveys among professional forecasters; and price data on financial products linked to inflation. Third, the various indicators yield strongly diverging results regarding the level, the trend and the volatility of inflation expectations: Some indicators seem to follow actual headline HICP inflation rather closely, others tend to follow longer-term non-stationary trends, while a third group appears to be stationary, moving hardly at all. Fourth, the divergence among the various indicators appears to have increased since mid-2007, together with the sharp swings in HICP headline inflation.

Several questions arise from the divergent development of the various indicators: Is this divergence an indication of expectations differences across types of economic agents and/or the different expectations horizons covered; or do differences reflect measurement errors related to the data collection or processing methodology or the source of information? In the former case, which sectors, agents and time horizons should monetary policy makers monitor particularly closely, and which are less relevant? Would other, additional indicators be desirable, and if so, which ones?

This article takes the many open issues in the measurement and interpretation of inflation expectations as a starting point and focuses on three interrelated questions, the first two of a more conceptual and the third of a more statistical nature: (1) *Whose infla-*

Chart 1

Inflation Expectations in the Euro Area

HICP inflation
Long-term inflation expectations (Consensus Forecast)
Inflation expectations five years ahead (SPF)
Consumer expectations
Break-even inflation rate (maturity: 2012; France)
Break-even inflation rate (maturity: 2032; France)
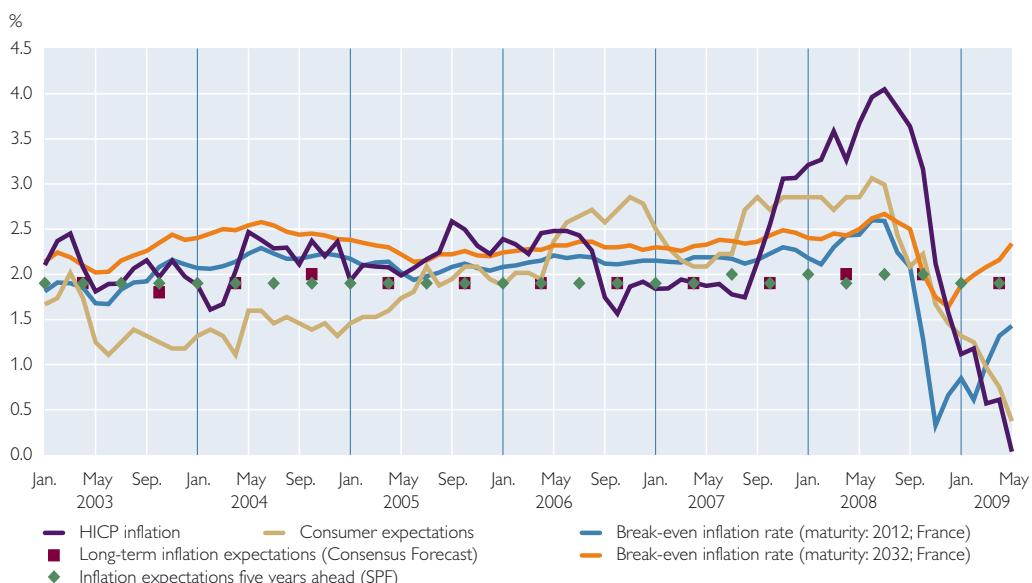
Source: ECB, European Commission, Consensus Economics.

tion expectations should be monitored? To answer this question, we need to have a clear view of the transmission through which inflation expectations might feed through to actual inflation, and of what the central banks' relevant constituencies are when it comes to credibility of the commitment to maintain price stability. (2) What is the most relevant *time horizon* for inflation expectations from the central banks' perspective? (3) How should we measure inflation expectations *in practice*? What are the strengths and weaknesses of the various measures available in the economic literature? What measures seem most suitable in the light of the answers to the first two questions? Is the range of available measures satisfactory?

The structure of the article follows the above logic: *Section 1* summarizes the relevant theoretical literature on the role of inflation expectations in price formation and for monetary policy making. Building on this review, *section 2* discusses the first two research

questions, namely which agents' inflation expectations should be monitored by central banks in the conduct of monetary policy; and the appropriate time horizon(s) of inflation expectations to be considered. *Section 3* provides an overview of available measures of inflation expectations as used by central banks in practice and discusses and evaluates their usefulness in guiding monetary policy decisions. *Section 4* offers a policy application, by empirically investigating how (various measures of) inflation expectations affect actual inflation. *Section 5* concludes.

1 Role of Inflation Expectations in Monetary Policy: What Do We Know from Theory?

The traditional Keynesian model assumes that inflation is either due to demand pull or cost push factors. Demand pull shocks raise inflation through excessive demand, which monetary policy can dampen (or stimulate in case of negative demand gaps). By contrast, counteracting cost push shocks may involve

a tradeoff, as restrictive monetary policy pushes output below potential. While these issues are also emphasized in the New Keynesian model[2], the latter goes beyond the previous analysis by suggesting that also *expectations about future inflation* may pose a risk to price stability.

Within the New Keynesian framework, the economy consists essentially of three sectors: a household sector, a monopolistically competitive firm sector and a central bank that conducts monetary policy by setting the interest rate depending on movements in inflation and the output gap. Since firms operate in an environment of monopolistic competition, they have some market power, and therefore their price setting behavior determines inflation dynamics. Basically, prices are set as a markup over marginal cost. Moreover, prices are to some extent sticky, in the sense that not all prices are adjusted in every period.

An important feature of this class of models is that agents are assumed to be forward-looking, so that decisions are not only influenced by current but also – and maybe predominantly – by expected future developments. This gives expectations about future inflation a prominent role.

How can revisions in inflation expectations influence output and inflation dynamics in this framework? As a starting point, consider the demand side of the economy. Suppose that the household sector revises its forecast of future inflation upward. Everything else equal, this results in a lower expected real interest rate, which reduces the return on savings and therefore raises the current demand for consumption goods. Similarly, the lower expected real interest rate increases firms' investment. Thus, aggregate demand rises due to the upward revision of inflation expectations.

So essentially, such a shock to expected inflation has similar consequences as a standard demand shock hitting the economy: Firms face higher demand and therefore produce higher output, which leads to an increase in the marginal cost of production. Higher production costs, in turn, lead to higher prices and inflationary pressure. Thus, we observe both an increase in output and in inflation (Clarida et al., 1999). By adjusting the nominal interest rate, the central bank can stabilize the economy.

Next, consider a situation where the shock to expected inflation first affects price setting. Suppose that firms' inflation expectations increase. Due to the assumption of price stickiness, the firms may not be able to adjust prices for a considerable period of time. Therefore, they will already raise prices today, and we end up with an instantaneous increase in inflation. Essentially, this type of situation closely resembles a supply shock. Stabilization policy is more complicated in this case, because to counteract inflationary pressures, the central bank needs to tighten monetary policy, which has a dampening effect on output.

In short, the implications of expectation shocks (i.e., revisions in expectation) are similar to the implications of demand and supply shocks in the New Keynesian model. So far, in our discussion we implicitly made the assumption that revisions in expectations do not become self-fulfilling. That is, we assumed that over time the economy stabilizes and the impact of the expec-

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[2] *For detailed descriptions of this type of model, see e.g. Clarida et al. (1999); Woodford (2003) or Galí and Gertler (2007).*

tations shock disappears. However, this need not be the case. In fact, this is only the case if monetary policy reacts appropriately and does not accommodate these revisions of expectations.

Consider again the case where households expect higher inflation. As discussed above, this expectations shock translates into lower expected real interest rates. In addition, suppose that the central bank tightens monetary policy but not by enough to stabilize the real interest rate. As a result, the nominal interest rate increases but not sufficiently to compensate the rise in expected inflation. The resulting lower real interest rate reduces savings and pushes up aggregate demand. The higher demand induces firms to step up production. However, this is only possible at higher marginal cost. Therefore firms will raise prices and inflation will rise. In other words, the initial expectation is confirmed and the revision of expectations becomes self-fulfilling. In order to avoid such effects and guarantee a unique and stable equilibrium, central banks therefore need to raise nominal interest rates sufficiently, i.e. at least one-for-one to changes in the expected inflation rate.

This result is called the Taylor principle (Woodford, 2003). Several studies argue that the success of monetary policy in reducing and containing inflation since the early 1980s is primarily due to the implementation of monetary policies observing the Taylor principle (e.g. Judd and Rudebush, 1998; Taylor, 1999; Clarida et al., 1998, 2000).[3] These studies typically estimate interest rate rules with U.S. data for pre-1979 and post-1979 and document that the reaction to expected inflation in-

creased substantially in the post-1979 period. More recently, Leduc et al. (2007) analyze survey data for the U.S.A. and reach a similar conclusion.

To summarize, as long as the monetary policy response to revisions in inflation expectations is sufficiently strong, the macroeconomic consequences of such revisions closely resemble those of standard demand and supply shocks. By doing so, the central bank is able to avoid the macroeconomic instability associated with self-fulfilling expectations. If monetary policy is considered credible in pursuing such a strategy, inflation expectations will not deviate from the central bank's price stability objective in the first place, and inflation expectations are considered to be well-anchored.

2 Two Conceptual Issues: Whose Inflation Expectations, and for what Time Horizon(s)?

A discussion on the measurement of inflation expectations should start from the purpose for which this information is sought. As indicated in the introduction, the aim of monitoring inflation expectations is basically twofold: first, to obtain indications about the credibility of the central bank's commitment to safeguarding price stability; and second, to collect information about future price dynamics over time. Depending on the purpose, the time horizon of inflation expectations as well as the type of agents whose expectations are monitored may differ.

2.1 Which Agents' Inflation Expectations Should Be Monitored?

Very simple models incorporating inflation expectations assume expecta-

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[3] Similarly, in a series of papers, Orphanides (2002, 2003, 2004) argues that the instability observed in the 1970s was the consequence of too ambitious goals for output stabilization and too pessimistic real-time estimates of the output gap.

tions to be homogeneous across economic agents, including policy makers. A first refinement is to assume that private agents' expectations may differ from the central bank's expectations, e.g. due to information asymmetries resulting from private information on economic indicators which the central bank does not disseminate. A further refinement is to relax the assumption of homogenous inflation expectations among private agents.

A number of empirical studies confirm that e.g. consumer inflation expectations are heterogeneous (Mankiw et al., 2003; Curtin, 2005; for the euro area, see Forsells and Kenny, 2004). In the theoretical economic literature, two main reasons are given to account for heterogeneity of inflation expectations: inattention and learning. Thus, heterogeneity may arise from differences in the scope of information available or used by agents and from differences in the speed of information processing and expectations adjustment (Brayton et al., 1997). In the case of *rational inattention* (Sims, 2009), agents do not process all available information due to their finite information processing capacity that arises e.g. from the limited time available for or devoted to specific decisions.[4] Furthermore, different agents may assume different probability distributions over uncertain states of the economy, yielding different probability distributions for inflation expectations. The interesting aspect here is that the differences in agents' information processing likely lead to persistent differences in inflation expectations. This argument applies *a forteriori* in periods of new, un-

precedented situations, in which no long history of repeated observations has led to a convergence of views among agents.

In the case of *learning*, agents have imperfect knowledge on the structure of the economy or on policy makers' reaction functions, and rely on perpetual learning to form and update their expectations. It can be shown that the assumption of learning increases the sensitivity of inflation expectations to economic shocks, thus creating the possibility of endogenous "inflation scares." Furthermore, under learning, inflation expectations may follow a time-varying process and contain useful information for monetary policy (contrary to a situation of rational expectations with full credibility, where they merely reflect the central bank's price stability target) (Orphanides and Williams, 2005; Orphanides, 2009).

To sum up, agents or sectors may differ in the way they form inflation expectations, which may result in persistent differences in inflation expectations. Inflation expectations heterogeneity varies over time, moving with inflation, the variability of inflation and the variability of relative prices (Mankiw et al., 2003). It is useful for a central bank to explicitly monitor different agents' or sectors' inflation expectations, taking into account how these expectations may ultimately feed into current and future consumer price inflation. Section 2 shows that, depending on the sector where a shock to inflation expectations originates, its impact on the economy and the appropriate policy response may differ. Blanchflower (2008), for instance, argues that

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[4] *The concept is similar to the one of economically rational expectations (Feige and Pearce, 1976), according to which people should collect and process information until the cost of an additional piece of information outweighs the benefits of an improved forecast. Theoretical skepticism on the accuracy of households' inflation expectations is confirmed by surveys, which often reveal a lack of knowledge about the very concept of inflation, its recent and current rate as well as its future development (Blanchflower and Kelly, 2008).*

the expectations of price and wage setters matter most for inflation prospects (see also Landau, 2009). But also a shock to financial markets' inflation expectations may be very relevant, since it may affect financing conditions and thus aggregate demand and public and private sector debt developments.

In principle, the different agents' or sectors' inflation expectations should eventually converge. However, this may take rather long (ECB, 2009b). It has been shown theoretically and empirically that a clear monetary policy strategy can help reduce heterogeneity and support convergence of inflation expectations (Orphanides, 2009; Capistrán and Ramos-Francia, 2007). Linked to this, heterogeneity regarding the expectations formation by various agents or sectors may also have implications for effective central bank *communication*. Different constituencies require different types, and different detail, of information on the economic and inflation outlook and the central bank's reaction function. Central banks should aim to reach out to all groups of society and provide information that is relevant for the various decision-making horizons. Given the diversity of the various agents' ability or willingness to process information, Sims (2009), proposes a multi-tiered communication strategy, ranging from very detailed and analytical explanations for sophisticated constituencies such as financial markets to simplified – but not misleading – policy descriptions.[5]

In this context, it is also relevant to note that inflation expectations of various sectors or constituencies may influence each other. For instance, Carroll (2003) shows empirically that house-holds' inflation expectations are influenced by news reports on the views of professional forecasters. Since households pay only occasional attention to such news reports, this inattention in the aggregate generates sticky inflation expectations. Lamla and Lein (2008) shed some light on the propagation mechanisms of inflation expectations, by investigating the influence of the media on consumers' inflation expectations. They find that both the intensity of news coverage of inflation (volume channel) as well as the content of such media reports (tone channel) exerts an influence. A related question raised in particular for consumers' and workers' inflation expectations is whether they are influenced more by actual (headline) inflation (biased downward by hedonic pricing and other factors) or by perceived inflation (biased upward by daily purchases) (White, 2009). In the latter case, inflation expectations would be subject to the various and complex psychological mechanisms which drive inflation perceptions (for the latter, see e. g. Fluch and Stix, 2005, 2007; Stix, 2006). Thus, to guide inflation expectations effectively, the central bank's communication strategy should also take into account the special role of opinion leaders and the media, as well as the importance of creating awareness of actual inflation as opposed to perceived inflation.

To sum up, it follows from the above considerations that monetary policy should simultaneously monitor inflation expectations of various sectors and constituencies – households, wage setters, price setters, financial markets and opinion leaders (such as professional forecasters and the media) –

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[5] Note that the aim of such differentiated communication policy is to shape the simplified views that the public would form in any case so as to reach a common, less heterogeneous view of the future course of economic variables and policy.

for the following reasons. First, the appropriate monetary policy response may differ depending on the sector from which an expectations shock originates. Second, the central bank should monitor its credibility across a broad range of constituencies of society. Finally, inflation expectations across various sectors may influence each other; therefore, it is worthwhile to pay particular attention to opinion leaders such as professional forecasters and the media, given their potential influence on other sectors' inflation expectations. Financial markets' inflation expectations play an important role insofar as they may exert a direct influence on the transmission of monetary policy and thus macroeconomic financing conditions.

2.2 What Is the Appropriate Time Horizon for Inflation Expectations for Monetary Policy Purposes?

An analysis of the development of inflation expectations is now a standard part of central banks' decision-making and communication. Mostly, reference is made to long-term inflation expectations.[6] For instance, long-term inflation expectations were (virtually) unaffected by the rise in inflation during 2007 and 2008 (chart 1) – a fact that the Eurosystem interpreted as a comforting sign for the credibility of its commitment to price stability. Rising short-term inflation expectations as indicated by survey indicators were, by contrast, regarded as less relevant, inter alia due to their short-time nature. Is

this emphasis on rather long horizons of five years and beyond justified?

A first counterargument could be that stable long-term inflation expectations might reflect a lack of meaningful information and the impossibility to prepare forecasts for such long time horizons rather than a conscious vote on a central bank's credibility.[7] Skepticism about the information content of longer-term inflation expectations may also be motivated by agents' myopic behavior in the sense that long-term inflation expectations might simply be ignored for some economic decisions.

Second, in many economic models, monetary policy shows its most powerful effects on inflation over time horizons of two to three years. This is also the usual horizon covered by macroeconomic forecasts – which are an important input factor for central banks' monetary policy decisions – and it may be deemed relevant for a central bank's medium-term price stability objective. It should thus be interesting for monetary policy makers to understand whether economic agents trust the central bank's commitment to safeguard price stability over those medium time horizons.

Special caution is called for with respect to very short-term inflation expectations of up to one year. Since inflation is usually measured on a monthly basis as the increase in the price level compared to 12 months ago, it takes a full year until the mechanical effect of a one-off shift in the price level disappears from the statistically measured inflation rate. Thus, it is reason-

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[6] The term "long-term inflation expectations" can have different meanings: It can refer to inflation in, for instance, 10 years, or to average inflation over the coming, say, 10 years, or else to average future inflation over a period of, say, 5 years in 5 years' time. For further details of these various concepts in the different measures of long-term inflation expectations, see section 3.

[7] A similar point is made by Kelly (2008), who argues that – provided the monetary policy target is credible – anchoring expectations to the target is clearly more economically rational in the sense of Feige and Pearce (1976) than any other means of expectations formation.

able and correct for inflation expectations up to 12 months to be affected by current and very recent price level shocks. Therefore, inflation expectations for horizons up to 12 months likely say more about price level effects than about monetary policy credibility.

All in all, it emerges that monetary policy and the related communication should simultaneously consider inflation expectations over various time horizons and not be content with anchoring very long-term inflation expectations alone (Landau, 2009). It is desirable to have term structure information on the expected dynamic development of inflation expectations rather than just an average value for inflation expectations over the long term.

This is especially highlighted by the current economic situation. Inflation in many euro area countries has turned negative around mid-2009, mostly as a result of the collapse of international energy and commodity prices. The strong downward price level effects will keep inflation below zero for several months but should be temporary. Very low inflation expectations over these very short horizons reflecting this development in actual inflation should thus not be a cause for worry.

As the recession unfolds and output gaps and unemployment increase, domestic and international inflation-dampening effects are mounting. This should keep inflation quite low until demand recovers and output returns toward potential (which may take some years). Given the time lags of monetary policy and the severity of the downturn, central banks worldwide will in many cases not be able to prevent a temporary undershooting of their inflation targets or definitions of price stability. Provided agents understand this, inflation expectations for horizons

up to two years or even beyond should be quite low, too.

At the same time, worries about the medium- to long-term inflationary consequences of expansionary and exceptional monetary and fiscal policies to fight the global crisis have been mounting recently and have gained considerable media attention. Should they be taken seriously by a sufficiently large number of agents, they may result in an increase in long-term inflation expectations. If, by contrast, central banks manage to credibly communicate to the public their ability and commitment to quickly and fully withdraw the current ample liquidity once the economy recovers, then long-term inflation expectations might remain stable around central banks' price stability objectives.

An interesting question is how inflation expectations across various time horizons might influence each other. If phenomena such as inflation persistence are a factor in agents' expectations formation, inflation expectations across horizons would be correlated. Furthermore, inflation expectations for various horizons might be linked through "expectations spillovers", which may arise from psychological phenomena governing perceptions (e.g. simplified expectations formation ignoring time horizons etc.).

Finally, it is noteworthy that the relevant time horizon for the various agents' inflation expectations may depend, among other things, on the different typical decisions they take. While rather short-term expectations of price fluctuations (e.g. regular sales periods, expected beginning and end of government subsidies for certain purchases) may be relevant for certain consumption decisions, the longer-term perspective might also play a role for other decisions involving e.g. durable

consumption goods. Companies' price setting may be influenced by expectations regarding the horizon for which a price list is valid. For wage negotiations, which usually cover the next one or two years, prospective inflation developments over this period may be particularly relevant. By contrast, for businesses' and savers' longer-term investment decisions, long-term inflation expectations extending over the life of the investment project and its financing may influence the expected real financing costs and profitability.

3 Measuring Inflation Expectations: Available Data

Inflation expectations are not directly observable but need to be estimated. There are three main sources of information that can help derive an indicator for inflation expectations. The first source is surveys among consumers or businesses about their expectations regarding future price developments. A second option is to ask professional forecasters about their most recent inflation projections. The third option is to gain information from financial market data. The following sections describe these data sources and their advantages and drawbacks in more detail in the light of the discussion of the previous section.

3.1 Surveys Among Consumers and Businesses

A straightforward way to measure inflation expectations would be to directly ask people about their views on future inflation. A few surveys follow this approach, e.g. the Swedish Household Survey or the University of Michigan survey of consumer attitudes. On an experimental basis, the European Commission's monthly business and consumer surveys also include an explicit question on respondents' infla-

tion expectations. The problem is that economic agents do not even have a realistic view on current inflation. Several studies (Jonung, 1981; Palmqvist and Strömberg, 2004; Lindén, 2006) show that consumers asked about the current inflation rate come up with figures that deviate substantially from reality. The lower the household income and the lower the education level, the more inflation perceptions and expectations deviate from measured values. The reason for this gap between measured and perceived data is that inflation is in general a variable that is difficult to assess or even understand. Respondents' consumption baskets do not necessarily correspond to the one used for calculating consumer price indices.

An alternative approach is to indirectly ask about relative price changes over time and convert this information into an index of inflation expectations. This is what the European Commission does as part of its monthly business and consumer surveys. Consumers are asked about the development of consumer prices over the next 12 months compared with the past 12 months: Will they increase more rapidly (PP), increase at the same rate (P), increase at a slower rate, stay about the same (N) or fall (NN)? We can calculate a balance index as a weighted difference between the positive and negative responses using the formula $I = (pp + 0.5p) - (0.5n + nn)$, where p, pp, n and nn represent the respective share of respondents in the corresponding response category. An index value close to zero would thus in normal times indicate that prices are expected to increase at a small positive rate. In a similar way, businesses in the manufacturing and construction industry as well as in the retail and services industries are asked about their expectations of

selling price changes over the next three months (increase (P)/remain unchanged/decrease (N), in this case the index formula is $I = p - n$). As expectations may be affected by seasonal effects, the balances are seasonally adjusted. While the data derived from the consumer survey can be interpreted as CPI inflation expectations, the business surveys should rather be interpreted as information about very near-term price setting plans in that specific industry. They are thus not considered further in this article.

The advantage of the EU survey data is that they are available for a large set of countries (all EU countries) on a standardized basis and at monthly frequency. Around 20,000 consumers throughout the EU take part in these monthly surveys on inflation expectations.

The drawback is that the index figures cannot be directly interpreted as inflation expectations. There are various approaches to converting the index data into figures that are broadly in line with inflation figures (Carlson and Parkin, 1975; Batchelor and Orr, 1988; Berk, 1999, or Millet, 2006). The consumer expectation measure in chart 1, for instance, follows the method of Berk (1999). However, these approaches generally rely on a set of restrictive assumptions such as the unbiasedness of expectations. A further problem may be that the given set of answers allows for only a rather rough quantification of expected price changes. Respondents may also have difficulties differentiating between price level changes and changes in the rate of inflation.

A final drawback is the rather short horizon of the questions that ask for price trends over the next year. As explained in section 2.2, inflation expectations for horizons up to 12 months are likely to be affected strongly by current and recent price level shifts, given that inflation is usually measured in annual comparison. Chart 1 illustrates the close co-movement of the euro area inflation rate with the index of inflation expectations derived from consumer surveys. As argued in section 2.2, the horizon that is most relevant for monetary policy considerations clearly extends beyond one year.

3.2 Professional Forecasters

Given that nonprofessional economic agents find it difficult to even correctly judge current inflation, another survey type targets agents that can be expected to be better informed: professional economists or forecasters, who have the resources for, and a professional interest in, more sophisticated economic forecasting. The idea behind conducting surveys among professional forecasters, which is also supported by the literature (Batchelor, 2001; Blix et al., 2001; Zarnowitz, 1984), is that individual forecasters rarely outperform average forecasts systematically. Consensus, or average, forecasts should thus minimize forecast errors and provide a more reliable indicator of inflation expectations.

For two decades, *Consensus Economics*, a private British survey company, has conducted a monthly survey among financial and economic forecasters worldwide on a range of variables including also consumer price inflation. The euro area panel is made up of 34 forecasters. The monthly publication provides inflation forecasts for the current and the next year. Twice a year (April and October), Consensus Economics also undertakes special surveys on long-term forecasts which extends as much as 10 years into the future (the number of respondents is only around 10, though). The major advantage is the

long historical data availability (since 1989 for individual euro area countries) and the large global set of countries covered.

The *Euro Zone Barometer* is a comparable monthly survey, although with a much shorter history. Since mid 2002, 28 forecasters associated with financial institutions have been surveyed on a monthly basis. It is focused primarily on the euro area. Longer-term inflation expectations (up to five years ahead) are surveyed four times a year (number of respondents: only 10). There is a sizeable overlap of 23 respondents in the Euro Zone Barometer panel and the Consensus Economics panel.

Since early 1999, the ECB has been conducting the *Survey of Professional Forecasters (SPF)*, which asks a panel of nearly 90 EU-based participants from financial institutions, research institutes, as well as employers' associations and trade unions about their forecasts for the euro area at quarterly intervals (Garcia, 2003), including predictions on inflation. Almost two-thirds of the forecasters in the panel respond to the questionnaire. SPF forecasters are free to use a forecasting method of their choice; in practice, time series models are most common, and most participants use several approaches. Nevertheless, judgment plays an important role: on average, respondents consider 45% of their forecast to be judgmental (ECB, 2009a). Data on long-term forecasts (five years ahead) are also collected, and the number of respondents is considerably larger than for the other two surveys of forecasters (first quarter 2009: 48 respondents). The main results are regularly published in the ECB's Monthly Bulletin.

A distinctive feature of the SPF is that it does not only ask for point estimates but also for complete probability distributions. Accordingly, forecasters are to allocate subjective probabilities to intervals with a width of 0.5 percentage points. This sheds light on the risk distribution around the most probable forecast value. Chart 2a shows the results of the SPF in the second quarter of 2009. It gives the probability distributions for the years 2009, 2010 and 2013. While experts expect HICP inflation to be around 0.5% on average in 2009, the probability distribution gradually shifts toward inflation levels in line with the Eurosystem's definition of price stability as the forecast horizon extends more into the future. Chart 2b gives information on how the distribution of expectations for the year 2010 has shifted over time. We can see from the chart that the distribution has both shifted to the left and become flatter, i.e. inflation forecasts for 2010 have been revised downward and have become more heterogeneous among forecasters over the past three quarters.

Chart 3 compares the results of the three surveys among professionals since 2003. Generally they lead to the same conclusion that longer-term inflation expectations in the euro area are firmly anchored. Most of the time, the point estimate was 1.9%, a number that is in line with the Eurosystem's definition of price stability of "below but close to 2%." Only during 2008, when HICP inflation in the euro area reached levels of up to 4%, expectations increased to or above 2.0%. This trend can be expected to have reversed during the financial crisis and the sharp decline in inflation.

The advantage of surveys among professional economists is that they provide direct information about inflation expectations at various time horizons. Furthermore, they provide more detailed information on how economists form their inflation forecasts. The drawback is that inflation forecasts

Chart 2a

SPF Results in Q2 09

% of respondents

Annual change in %

■ HICP 2009 ■ HICP 2010 ■ HICP 2013
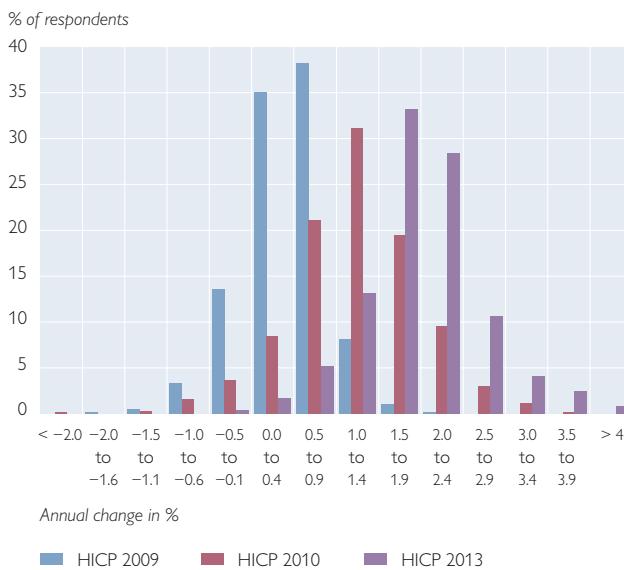
Source: ECB.

Chart 2b

**SPF Estimates for Headline HICP for 2010:
Changes Over Time**

% of respondents

Annual change in %
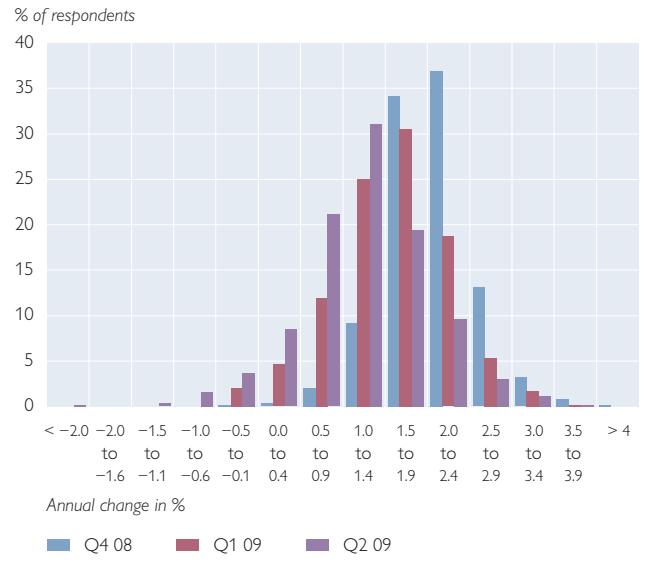
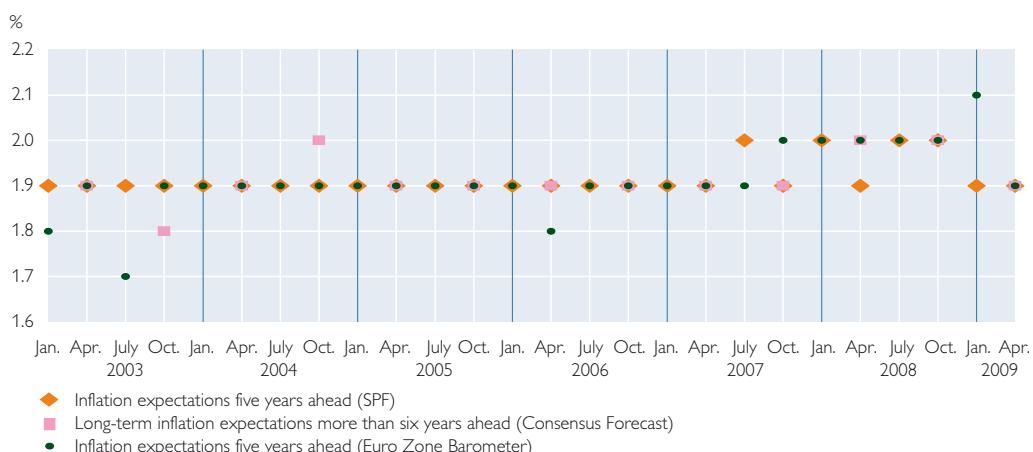■ Q4 08 ■ Q1 09 ■ Q2 09

Source: ECB (survey dates: Q4 08, Q1 09 and Q2 09).

cannot necessarily be interpreted as measures of inflation expectations. Inflation forecasts are the results of econometric models based on a set of assumptions on future commodity prices and exchange rates as well as the economic development in other countries. This approach can substantially deviate from the way consumers,

workers or businesses form their inflation expectations.

A further problem with surveys of forecasters is that the expense and time involved to make the forecasts cannot be verified in practice. Model forecasts are likely made only at rather large intervals of time and updated on a purely judgmental basis in the mean-

Chart 3

Long-Term Inflation Expectations in the Euro Area

%

◆ Inflation expectations five years ahead (SPF)
■ Long-term inflation expectations more than six years ahead (Consensus Forecast)
● Inflation expectations five years ahead (Euro Zone Barometer)

Source: ECB, Consensus Economics, MJEconomics.

time. In the case of the SPF, a special investigation (ECB, 2009a) showed that 35% of participants update their forecasts on a monthly basis, while more than one-half of the participants do so on a quarterly basis. In addition, around one-quarter partially update their forecasts when responding to the SPF. Overall, this suggests that the survey responses are based on rather timely assessments.

Finally, professional forecasters might respond strategically. Bewley and Fiebig (2002) show that forecasters tend to indicate values in the safe consensus range so as not to stick their neck out with forecasts that deviate dramatically from the mean. Lamont (1995) comes up with the opposite hypothesis that professional forecasters have a tendency to reveal extreme forecasts – even if they deviate from their true expectations – in order to gain attention; he maintains that this tendency increases with the forecaster's age. Both factors may lead to a bias in the distribution of submitted inflation expectations. The Deutsche Bundesbank (2001) compares surveys among households with those among professional experts and finds that the latter do not systematically outperform businesses' or consumers' inflation expectations. Both do not make efficient use of all available information when making their forecasts. Batchelor and Dua (1989) even show that U.S. households' inflation expectations are more accurate than those of professional forecasters. By contrast,

Gerberding (2006) and Mestre (2007) find that expert forecasts are substantially more precise and rational than household expectations.

3.3 Financial Market-Based Indicators

A third approach to derive inflation expectations is to draw information from financial market data. The most common approach uses information from inflation-linked bonds: Like conventional bonds, inflation-linked bonds combine regular coupon payments and principal payment at maturity. The distinct feature is that either the coupon rate or the underlying principal is adjusted to keep pace with inflation, thus preserving the real value of both income and capital. They are thus attractive to investors who wish to hedge against inflation variability.[8]

The so-called *break-even inflation rate (BEIR)* is calculated as the yield differential between conventional nominal bonds and index-linked bonds that – apart from the indexation – have comparable characteristics (maturity, creditworthiness).[9] The BEIR is thus a measure for inflation expectations of financial market investors. In the euro area, the first bond with coupon payments indexed to euro area inflation (HICP excluding tobacco) was issued by the French Treasury in 2001 based on experience with similar bonds indexed to the French CPI that have been issued since 1998. Today, Greece, Italy and Germany also issue similar index-linked bonds that are linked to the euro

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[8] *The first market of inflation-indexed government bonds was launched in New Zealand in 1977. Motivations for launching inflation-linked bonds can be financial innovation and diversification, an attempt to reinforce the credibility of inflation fighting policies or the desire to lower the inflation risk premium in nominal rates.*

[9] *To be more specific, the BEIR at time t is calculated as $BEIR_{t,M} = i_{t,M} - r_{t,M}$, where i is the return on a conventional nominal bond and r denotes the return on an index-linked bond of the same maturity M. This is a linear approximation of the Fisher identity linking the ex ante nominal and real (zero coupon) interest rates with the average expected inflation rate $(1+r) = (1+i)/(1+\pi^e)$.*

area HICP (excluding tobacco, as in the case of the French bonds).[10] The market for inflation-linked bonds in the euro area is by now the second-largest after the U.S. market.

The main advantage of the BEIR is its timeliness and high (daily) frequency. Furthermore, it does not rely on statements of interview respondents but on inflation expectations that form the basis for actual market trading. Finally, BEIR measures also cover various time horizons that extend long into the future and therefore complement the shorter horizon information gained from consumer surveys.

The major drawback is that the BEIR level can in general not be interpreted directly, because it is influenced by a number of interest rate premiums related to liquidity[11], inflation uncertainty, risk aversion of market partici-

pants or differences in tax treatment as well as by seasonality effects.[12] The distinction between movements in inflation expectations and movements in the various premiums is difficult. Recent studies (Ang and Bekaert, 2003, or Buraschi and Jiltsov, 2005) estimate the inflation risk premium embodied in U.S. long-term bond yields between 20 and 140 basis points.

This drawback is further aggravated by the time-varying nature of some of these premiums. For example, investors tend to become more risk averse during recessions, so that risk premiums rise. The time dependency of premiums has been highlighted in the current financial crisis and aggravated by investors' portfolio shifts. As can be read from chart 4, the BEIR increased markedly in the first half of 2008. This pattern can be interpreted as an in-

Chart 4

Break-Even Inflation Expectations for the Euro Area
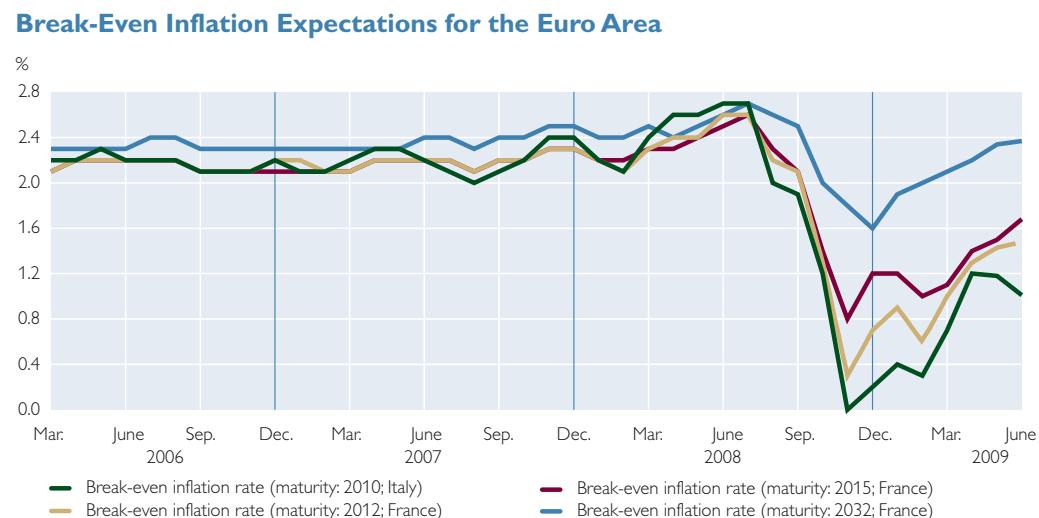
Source: ECB.

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[10] If the headline HICP is persistently higher than the HICP excluding tobacco – as was the case during the last decade – inflation expectations derived from index-linked bonds would imply a negative bias.

[11] The liquidity of indexed bonds tends to be lower than the liquidity of corresponding nominal bonds.

[12] BEIR seasonality is a direct consequence of seasonality in inflation rates. This stems from the fact that the remaining maturity of bonds shortens over time and is therefore usually not a multiple of a full year, so that some months of the year are overrepresented in overall inflation over residual maturity. This phenomenon gains importance with the shortening of the remaining maturity of the bond.

crease in inflation expectations against the background of increasing oil and food prices. From July onward, the turnaround in oil prices and the increasing likelihood of an upcoming recession changed inflation expectations. However, the pronounced downward trend observed in the BEIR cannot be interpreted solely as declining inflation expectations: Some of the BEIR measures with shorter maturity dropped to almost zero in late 2008.

In the course of the financial crisis, investors shifted their portfolios toward the most liquid and secure assets and away from long-term engagements. While investors tended to shift funds from stocks to bonds, thus causing nominal bond yields to shrink, there was an additional effect in the opposite direction in index-linked bond markets as demand for these less liquid bonds dropped.[13] The yield spreads between conventional and index-linked bonds thus contracted markedly. At times, liquidity in the markets for index-linked bonds was so low that single transactions caused BEIR movements.

A normalization of the markets has been observed only since end-2008. This illustrates that the BEIR needs to be interpreted against the background of uncertainty and risk aversion in financial markets, duly taking into account possible price distortions for various reasons in these markets (for a comprehensive explanation, see Hördahl, 2009).

In order to abstract from the various premiums that effect the movement of the BEIR, it is useful to take into account evidence from inflation swap markets. An *inflation swap* is a derivative instrument that – similar to regular interest rate swaps – exchanges a fixed payment for a variable payment. In the case of inflation swaps, the variable payment is linked to inflation over the life of the swap. The measures of inflation expectations derived from inflation swaps are unaffected by differential liquidity conditions in nominal and real bond markets or by flight-to-liquidity flows. Chart 5 shows inflation-linked swaps for different maturities. A comparison with chart 4 shows

Chart 5

Inflation Expectations for the Euro Area Based on Inflation-Linked Swaps

Source: ECB.

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[13] *Even under normal market conditions, inflation-linked bonds are substantially less liquid than their conventional counterparts. This liquidity disadvantage tends to be aggravated during periods of financial market stress.*

that, until the outbreak of the financial crisis, all financial market-based inflation expectations indicators fluctuated at a similar level slightly above 2%. Toward the end of 2008, the BEIR and inflation swaps-based inflation expectations started to decline, indicating lower inflation expectations. However, the decline in inflation swaps was far less pronounced, which suggests that liquidity effects played a significant role in the bond spot markets.

A drawback of inflation swaps is that they may incorporate a premium for counterparty risk. In addition, they have only been available since 2005 and are thus not considered further in this article.

There are two further drawbacks of conventional BEIR measures. The first is that 10-year spot BEIR measures gauge average inflation over the entire 10-year holding period. It may, however, also be interesting to abstract from the near-term inflation outlook and focus on longer-term inflation expectations. A way to achieve this is the *implied forward BEIR* measures, calculated from a decomposition of the spot BEIR over various time horizons. If an implied forward BEIR is for example derived from two index-linked

bonds maturing in 2012 and 2015, the resulting measure of inflation expectations can be interpreted as investors' future average inflation expectations between 2012 and 2015. Implied forward BEIR measures have become widely used recently in the context of the current financial crisis, since they abstract from near-term inflation expectations which are potentially influenced by short-term uncertainty. Chart 6 shows that while the volatility of the implied forward BEIR five years ahead has increased somewhat since late 2008, there was no marked change in its overall level, suggesting that longer-term inflation expectations have remained broadly stable. This indicates that the credibility of the ECB's commitment to price stability has so far been unaffected by the crisis.

The second drawback associated with the interpretation of conventional BEIR measures over time is that the residual maturity of the bonds declines over time. This is problematic as some of the premiums change with residual maturity. Shifts in the BEIR may thus at least partly be due to changes in the residual maturity of the bonds. This problem can be overcome by using constant maturity BEIR measures such as

Chart 6

Forward Break-Even Inflation Rate Five Years Ahead for the Euro Area

Source: ECB.

Chart 7

Euro Area Inflation Expectation Curve Derived from Inflation-Indexed Swaps

(HICP excluding tobacco)
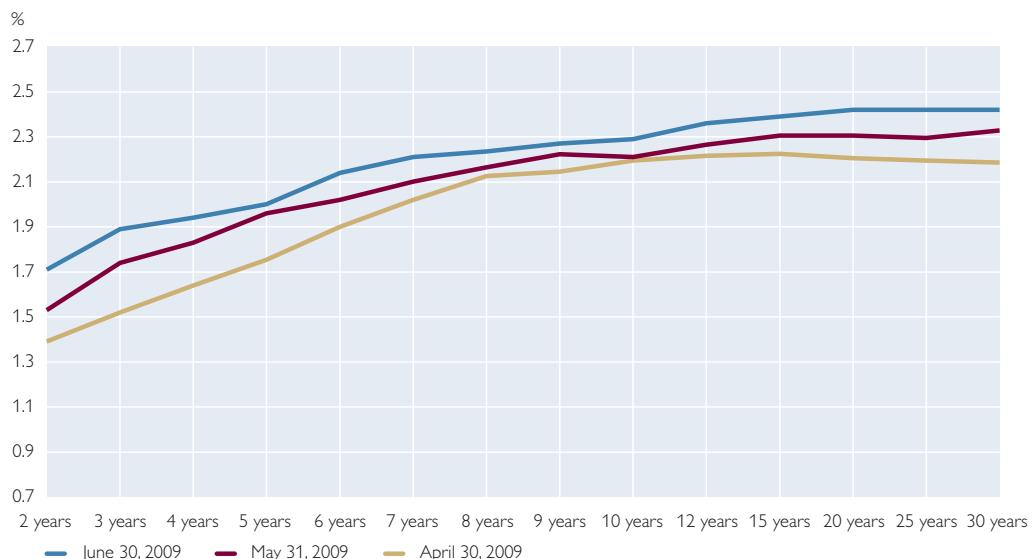
Source: Bloomberg.

inflation swaps. An alternative is the *zero coupon BEIR*, based on the estimation of comparable zero-coupon yield curves for index-linked and conventional nominal bonds. Their major advantage is that they provide informa-tion on a wider spectrum of maturities, especially also covering shorter hori-zons. Similarly, a term structure for inflation expectations across various maturities can be calculated from infla-tion swaps (chart 7).

Table 1

A Comparison of Inflation Expectation Indicators

Indicator	Agents	Method	Available since	Publishing institution	Frequency	Time lag to publication	Horizon in years	Sample size
European Commission's Consumer Survey	Consumers	Survey	1985	European Commission	monthly	1 to 2 weeks	t+1	20,000
Consensus Forecast	Professional forecasters	Survey	1989	Consensus Economics	monthly (long-term: biannual)	n.a.	t to t+10	34
Euro Zone Barometer	Professional forecasters	Survey	2002	MJEconomics	monthly	2 days	t to t+5	28
Survey of Professional Forecasters	Professional forecasters	Survey	1999	ECB	quarterly	1 to 2 weeks	t, t+1, t+5	90
Break-even inflation rate	Financial market participants	Yield differential	2001	Thomson Reuters, ECB	daily	Next day	t+4 to t+33	×
Inflation-linked swaps	Financial market participants	Derivative instrument	2005	Thomson Reuters, ECB	daily	Next day	t+2 to t+25	×

Source: OeNB.

Table 1 summarizes some key features of the various inflation expectations measures discussed. It becomes obvious, first, that only measures based on financial market data and input by professional forecasters cover medium- to longer-time horizons that are most relevant for monetary policy purposes. Second, data on consumers' inflation expectations are limited to the very short time horizon of up to one year. For wage or price setters' inflation expectations, no indicators are available for time horizons between two and ten years. Thus, while quite a number of measures for inflation expectations exist, they do not fully satisfy the needs suggested by economic theory, particularly as regards medium- to longer-term expectations of consumers, wage and price setters.

4 Do Shocks to Inflation Expectations Influence Actual Inflation? Some Empirical Evidence

4.1 Does Expected Inflation Affect Actual Inflation, and Are there Differences Across the Inflation Expectations Indicators Used?

As discussed in section 1, shocks to expected inflation may influence real economic activity and the inflation rate. In this section, we provide some empirical evidence on the link between shocks to expected inflation and actual inflation in the euro area. To do so, we estimate bivariate vector autoregressions (VARs) with inflation and several measures of expected inflation (as described in section 3) as endogenous variables. As discussed in section 2, inflation expectations may be heterogeneous. To take this potential heterogeneity into account, we conduct our analysis with proxies for expected inflation based on surveys among consumers or professional forecasters as well as proxies extracted from financial market data.[14]

We estimate bivariate VAR models containing two lags of the endogenous variables. The results are robust with respect to the inclusion of additional lags. However, due to the rather short time series, we chose to include only two lags in our preferred specification. To identify shocks to expected inflation, we assume that the inflation rate reacts contemporaneously to shocks to expected inflation, whereas expected inflation reacts with a one-period lag to fluctuations in the actual inflation rate. Leduc et al. (2007) use a similar assumption. To explore the dynamic interrelationship between expected and actual inflation, we use impulse response functions and variance decompositions.[15]

Chart 8.1 shows the impulse responses of inflation and expected inflation along with two standard error significance bands. Here, the inflation expectation measure is based on the European Commission's consumer survey. The left panel shows how inflation reacts to a shock to expected inflation, that is, the effect of an unexpected, one-time shock to consumers' inflation

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[14] Our sample for the euro area covers the period from January 1999 to February 2009. Data on CPI inflation are obtained from the OECD. We proxy expected inflation with the results of the European Commission's consumer survey, the Consensus Forecast is obtained from Consensus Economics and the data on index-linked bonds from Thomson Reuters.

[15] The latter are based on Cholesky decompositions, where expected inflation is ordered before actual inflation. This ordering captures our identifying assumption that expected inflation is contemporaneously predetermined. As a sensitivity analysis, we also use generalized impulse responses which are independent of the variable ordering. This analysis shows that our main conclusions are robust.

How Does Inflation React to Shocks to Expected Inflation?

Consumer Survey   Chart 8.1
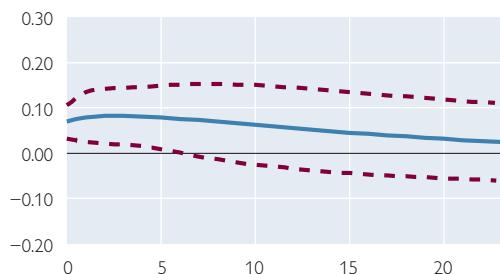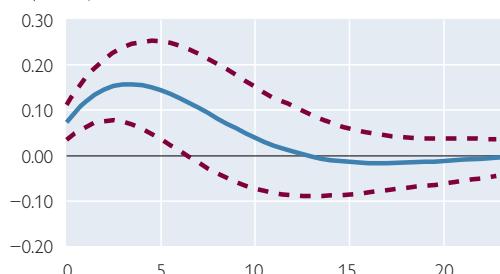
Response of INF to PEX

Response of PEX to INF

Consensus Forecast   Chart 8.2

Response of INF to PEX

Response of PEX to INF

2-Year Index-Linked Bond   Chart 8.3

Response of INF to PEX

Response of PEX to INF

5-Year Index-Linked Bond   Chart 8.4

Response of INF to PEX

Response of PEX to INF

—— Impulse response   - - - ±2 standard errors
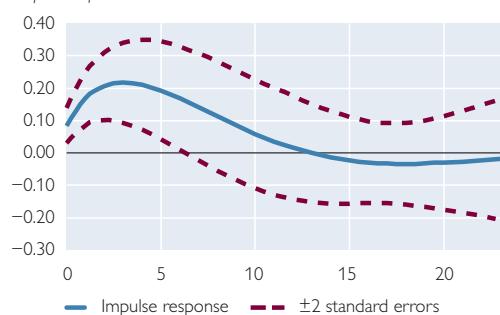
Source: Authors' calculations.

Note: The left panel shows the response of inflation (INF) to a shock to expected inflation (PEX) and the right panel shows the response of expected inflation to a shock to the inflation rate.
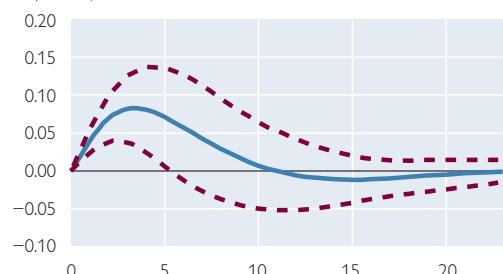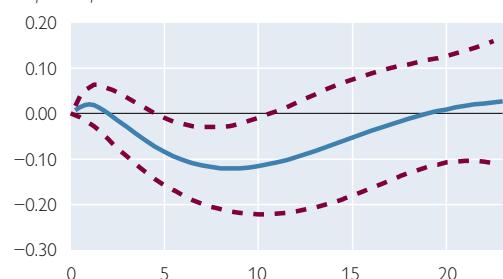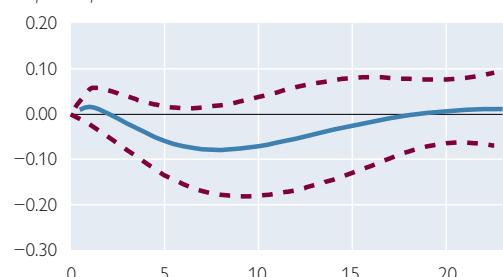
expectation (one year ahead). We see that actual inflation increases significantly. The response is rather persistent and inflation remains significantly above the pre-shock level for approximately eight months after the shock. The right panel of chart 8.1 shows that expected inflation rises briefly after a shock to the inflation rate and then declines. However, the response is not significant. Hence, our results suggest that expected inflation reacts only to a limited extent to fluctuations in actual inflation.

Next, we re-estimate the VAR using the Consensus Forecast (published by Consensus Economics) instead of the consumer survey as the proxy for expected inflation. Chart 8.2 shows the results. We see that the shock to expected inflation leads to a significant response of actual inflation, similar to the results using consumer expectations. Interestingly, here we find that expected inflation reacts significantly and positively to the shock in the inflation rate, which is in contrast to our results for the consumer survey discussed above.

Third, we explore how shocks to inflation expectations extracted from financial market data affect the dynamics of the actual inflation rate. More specifically, we use inflation expectations extracted from index-linked bonds with maturities of two and five years. Due to data limitations, the sample is slightly shorter for this analysis and covers the period from March 2002 to February 2009.

Charts 8.3 and 8.4 show the results. Shocks to expected inflation derived from index-linked bonds significantly increase actual inflation for around two to seven months after the shock, depending on the maturity of the bond. The impact of shocks to expected inflation turns out to be somewhat more pronounced when expectations are extracted from the five-year maturity bond.[16]

In short, although magnitudes vary across proxies for expected inflation, we find that shocks to the expected inflation rate significantly affect the dynamics of the actual inflation rate.

4.2 How Important Are Shocks to Inflation Expectations for Actual Inflation Dynamics?

Having demonstrated that expected inflation shocks significantly affect inflation, we now turn to the question

Table 2

Variance Decomposition of Inflation

Horizon in months	Consumer Survey	Consensus Forecast	2-year bond	5-year bond
	%			
1	8.31	9.68	15.91	13.02
4	9.90	27.46	44.10	44.64
10	16.61	40.80	60.57	60.40
16	20.59	41.12	56.40	59.29
24	22.39	41.26	56.12	59.28

Source: Authors' calculations.

Note: Variance compositions based on bivariate VARs with the inflation rate and one of the proxies of expected inflation are included as endogenous variables.

[16] We repeated the exercise also for 10- and 25-year index-linked bonds. The results were qualitatively similar and are printed in the annex.

How Does Inflation Respond to Inflation Expectation Shocks?
Pre-EMU Period

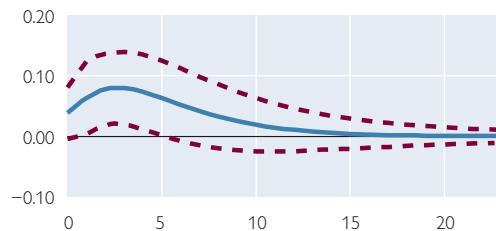**France**   Chart 9.1
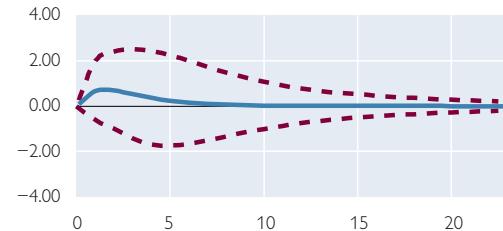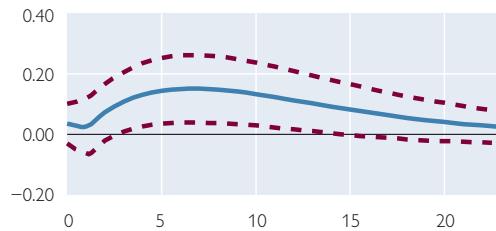
Response of INF to PEX   *Response of PEX to INF*

Germany   Chart 9.2

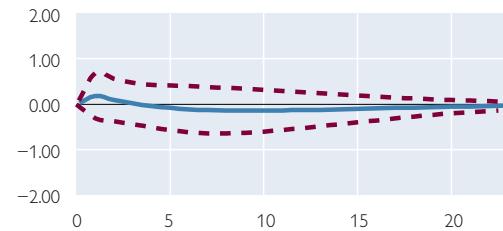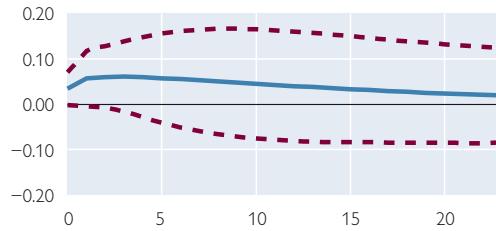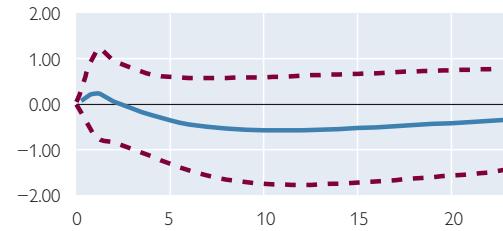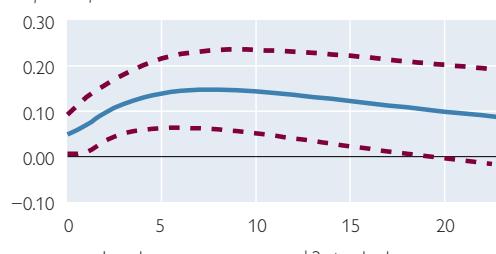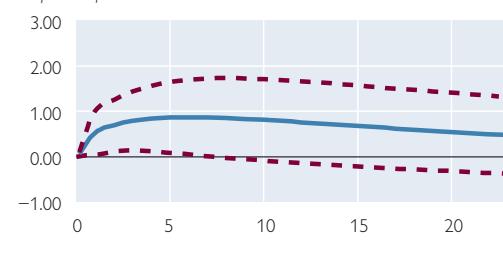*Response of INF to PEX*   *Response of PEX to INF*

Italy   Chart 9.3

Response of INF to PEX   *Response of PEX to INF*

Spain   Chart 9.4

Response of INF to PEX   *Response of PEX to INF*

——— Impulse response   ▬ ▬ ±2 standard errors

Source: Authors' calculations.

Note: The left panel shows the response of inflation (INF) to a shock to expected inflation (PEX) and the right panel shows the response of expected inflation to a shock to the inflation rate.

how important these shocks are for the dynamics of actual inflation. To do so, we compute the variance decomposition of the inflation rate, which allows us to assess the relative importance

of the individual shocks in the VAR (table 2).

We see that, depending on the proxy used for expected inflation, shocks to expected inflation account for

up to 13% of inflation variability at the one-period horizon. At the 24-month horizon, expectation shocks account for substantially higher fractions of inflation variability, especially when we use proxies for expected inflation which are extracted from index-linked bonds.

4.3 Did EMU Change the Influence Expectations Have on Actual Inflation?

As explained in section 1, from a theoretical point of view, the impact of shocks to expected inflation should be closely related to how monetary policy responds to these shocks. Therefore, it appears conceivable that the way expected inflation influences actual inflation has changed with the implementation of EMU. To analyze this issue, we re-estimate the VAR with data from France, Germany, Italy, and Spain for the period from January 1990 to December 1998. Inflation expectations are obtained from the European Commission's consumer survey only because of data limitations of the other indicators. To take into account that inflation declined in several EMU countries during the 1990s as a result of a convergence process, we include a time trend in the VARs.

Charts 9.1 to 9.4 show the results. We see that inflation expectations significantly affect actual inflation in France for about eight months following the shock. Expected inflation also responds to shocks to the inflation rate, although the response is significantly different from zero only between three and ten months after the shock. For Germany, we see that the largest effect of an inflation expectations shock occurs somewhat later, after eight months, and that expected inflation does not significantly react to actual inflation shocks. For pre-EMU Italy, although the signs of the responses

are in line with what we find for the other countries, neither inflation nor expected inflation respond significantly to shocks. For Spain, results are similar to those for France. Overall, we find no systematic differences concerning the impact of expected inflation before and after the introduction of the euro.

5 Conclusions

Inflation expectations are important for monetary policy. Particularly in periods of increased inflation volatility, monetary policy needs to pay special attention that inflation expectations remain firmly anchored at a level that is close to the inflation target or definition of price stability. This applies both to periods when inflation rises above the central bank's definition of price stability and to periods when it falls below it. The risk of a de-anchoring of inflation expectations in the wake of soaring energy and commodity prices figured among the key motivations for international hikes in official interest rates between 2007 and mid-2008. But also the recent abrupt decline in headline inflation – driven by the collapse in energy and commodity prices as well as the sharp global recession – may bear the risk of affecting inflation expectations, this time downward. An appropriate conceptualization and real-time measurement of inflation expectations is therefore important for successful monetary policy.

Building on the current state of economic theory and central bank practice, this study addressed four research questions: (1) Which agents' or sectors' inflation expectations should be considered? (2) What time horizon of inflation expectations is relevant for monetary policy decisions? (3) What are the relative merits and drawbacks of the various inflation expectations measures in the light of the answers to

the first two questions? (4) How do shocks to inflation expectations affect actual inflation in the euro area?

The study argues, first, that to gauge future risks for inflation and also to assess central bank credibility comprehensively across various constituencies, it would be desirable to capture wage setters' inflation expectations better than so far. Second, besides the much-quoted long-term inflation expectations, also medium-term inflation expectations (beyond one and below five years) should be given due consideration. Third, the empirical measures available only partly fit these conceptual requirements. Given the important limitations of the proxy measures currently available for the euro area, we recommend further research and better data coverage.

Finally, our empirical estimates show that shocks to expected inflation indeed influence actual inflation. This applies to all four indicators used – short-term consumer expectations, long-term forecasters' expectations, and medium- and long-term financial market expectations. For all measures of inflation expectations, shocks to expected inflation account for a non-negligible part of actual inflation dynamics. The influence is stronger for financial market-based measures and for forecasters' inflation expectations, which may also reflect the longer time-horizon of these indicators. Thus, expectation shocks may represent a serious risk for price stability.

We also find that the effects of shocks to expected inflation prior to EMU were quite similar to what we find using more recent data. We cannot confirm that EMU has significantly changed the transmission from inflation expectations shocks to actual inflation.
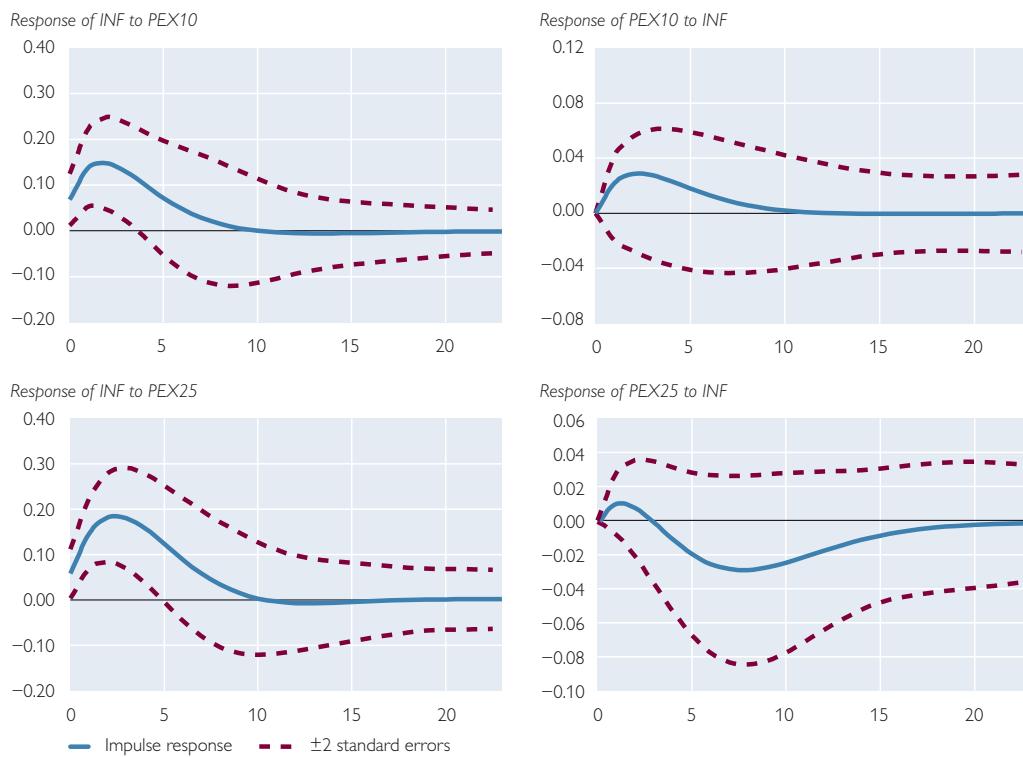
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Annex

Impulse Response Functions Based on Index-Linked Bonds with 10- and 25-Year Maturity

Response of INF to PEX10

Response of PEX10 to INF

Response of INF to PEX25

Response of PEX25 to INF

— Impulse response   ▪ ▪ ▪ ±2 standard errors

Source: Authors' calculations.

Note: The left panel shows the response of inflation (INF) to a shock to expected inflation (PEX) and the right panel shows the response of expected inflation to a shock to the inflation rate.

Responses of Austrian Firms to a Decline in Demand – Results of a Company Survey

Claudia Kwapil[1]

Based on a survey of around 560 Austrian firms conducted within Wage Dynamics Network (WDN) of the ESCB this study investigates how these firms respond to a decline in demand. About 80% of the firms surveyed report that they consider cutting costs a relevant or highly relevant measure in response to a demand shock. The interpretation of the responses suggests that such cost cuts mitigate, at least in part, the drop in output and thus tend to dampen the shock. Furthermore, 55% of firms stated that they would primarily cut nonlabor costs, while 45% would rather cut labor costs; also, firms would rather dismiss employees than cut their base wages. This attitude of Austrian firms can be mainly traced to their fear of declines in labor productivity.

This study investigates how Austrian firms respond to a demand shock and analyzes the effects of a decline in demand on prices and output. In addition to price and volume effects, cost cuts are found to play an important role. Moreover, the available data may also be used to examine the strategies Austrian firms use to cut costs. Thereby, special attention is paid to cost cuts that have consequences for the labor market.

The data used in this study stem from the Wage Dynamics Network (WDN), a research network set up by the ESCB. Within the WDN, researchers from the ECB and from 24 national central banks (NCBs) in the EU study the characteristics and sources of wage and labor cost dynamics in the euro area and other EU countries. The WDN follows various lines of research, one of which is based on an ad hoc survey on wage- and price-setting behavior at the firm level.

This survey provides a unique source of information that is to deepen our understanding of wage-setting practices, reasons for wage rigidities as well as strategies to reduce labor costs in Europe. One advantage of conducting an ad hoc survey at the firm level is

flexibility. By asking firms directly about what determines their wage-setting decisions and how they would respond to hypothetical situations it is possible to collect data that are otherwise difficult to obtain. Such firm-level information makes it possible to examine the effects of both firms' characteristics and their economic and institutional environment on wage setting. Furthermore, firm surveys typically have the advantage of providing more accurate information on wage developments than household surveys. Nevertheless, several shortcomings inherent in ad hoc surveys, such as low rates of response and potential misunderstandings in interpreting the questions, should be borne in mind. Moreover, the replies may be influenced by the specific macroeconomic environment prevailing at the time the survey is conducted.

The EU-wide company survey was carried out by 17 NCBs in autumn 2007 and in the first half of 2008 on the basis of a harmonized questionnaire. The Austrian survey, which was organized and conducted by the Austrian Institute of Economic Research (WIFO), started in November 2007 and took until February 2008, including two

Refereed by: Rudolf Winter-Ebmer, Johannes Kepler University Linz

rounds of reminder letters. A total of 3,780 firms were contacted by mail, and 557 returned the filled-in questionnaire. This corresponds to a response rate of approximately 15%. The survey covered firms in the following sectors: manufacturing, energy, construction, trade and transportation as well as other services (including financial intermediation). The data are weighted retrospectively so that the sample is representative of the overall number of workers in the sectors covered.

This paper concentrates on Austrian firms but also draws comparisons with the euro area (Belgium, France, Greece, Ireland, Italy, the Netherlands, Austria, Portugal, Slovenia and Spain)[2] and with the full sample (euro area countries plus Estonia, Lithuania, Poland, the Czech Republic and Hungary).

In the current situation, with the global economy in the deepest recession since World War II, companies' response to a demand shock seems to be of particular interest since the recession has the same effect on many firms as a negative demand shock. However, this survey was conducted in relatively tranquil economic times — with forecasts predicting growth rates close to potential growth and inflation rates around 2% — and even though problems were already looming on the U.S. mortgage market, their extent was clearly underestimated. Therefore, direct conclusions as to firms' behavior in times of crisis can be drawn only to a very limited extent.

1 Response of Output and Prices

The firms surveyed were asked to asses the relevance of the presented measures if their businesses were facing an un-

expected slowdown in demand. The respondents could choose from the following five response options: reduce output, leave prices unchanged, reduce prices, reduce profit margins or cut costs. Firms were requested to indicate whether they considered each individual measure "highly relevant," "relevant," "of little relevance" or "irrelevant." To facilitate the interpretation of answers, the categories "highly relevant" and "relevant" were regarded as approval and the categories "of little relevance" and "irrelevant" as disapproval.

Table 1 provides a first overview of the answers given by Austrian firms. The results suggest that, with an approval rate of about 80%, cost reduc-

Table 1

Relevance of Different Strategies in Response to a Demand Shock

Possible strategy	Approval rate in %
Reduce costs	79.65
Reduce profit margins	51.09
Leave prices unchanged	43.94
Reduce output	43.13
Reduce prices	23.85

Source: WDN survey of firms.

tions are a common measure to respond to a decrease in demand. At around 50%, measures such as reducing profit margins, leaving prices unchanged and reducing output gained somewhat less approval. The lowest degree of approval was given to reducing prices, which just some 24% of Austrian firms considered relevant.

Table 2 shows firms' responses in detail, presenting the overall set of measures chosen with regard to the fact that multiple answers were permitted. With an approval rate of around 10% each, the measures most widely chosen

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[2] *Data are not available for all countries of the euro area. Finland, Malta, Slovakia and Cyprus did not take part in the survey. Data on Germany and Luxembourg are not reported, either.*

Table 2

Relevance of Different Sets of Measures

Possible strategy	Approval rate in %
Reduce output and costs and leave prices unchanged	11.28
Reduce profit margins, costs and prices	10.64
Reduce output, costs and profit margins	10.03
Reduce costs	9.70
Reduce output, profit margins, costs and prices	8.67
Take no specific measures	7.41
Leave prices unchanged and reduce costs	6.94
Reduce output, costs and profit margins and leave prices unchanged	6.86
Reduce output, profit margins and costs	5.50

Source: WDN survey of firms.

are cutting output and costs while leaving prices unchanged (1), cutting costs, prices and profit margins (2), and reducing output, costs and profit margins (3).

As mentioned in the introduction, one difficulty of surveys lies in the scope for interpretation on the part of respondents. The results of this survey leave room for interpretation mainly with respect to the concept of "cutting costs." Since roughly 93% of the firms that decided they would reduce output also opted for cutting costs, the question arises whether, in this context, a reduction of costs was regarded as a reduction of total costs, which usually goes hand in hand with output cuts. Hence, these two measures would have been interpreted synonymously rather than as separate pieces of information as intended by the questionnaire (i.e. on the one hand, information on whether output was reduced and, on the other hand, information on whether marginal costs were cut).

If the firms actually interpreted the response option "reduce costs" as reduction of total costs, then the comparatively most common set of measures (table 2, reduce output and costs and leave prices unchanged) at an approval rate of about 11% can be presented as in chart 1. Chart 1 assumes monopolistic competition as approximately 58% of surveyed firms replied to the question of how they set their prices that they calculated their prices on the basis of costs, adding self-determined profit margins. Only about 27% of firms, by contrast, indicated that their prices followed those of their major competitor.

Chart 1 shows that a negative demand shock causes the demand curve to shift from D to D' and marginal revenues, accordingly, to drop from MR to MR'. Consequently, the firm presented would, *ceteris paribus*, move from starting point 1 ($MC = MR$) to point 2 ($MC = MR'$) and, accordingly, reduce output from Y_1 to Y_2. Given the assumed shape of the marginal cost and marginal revenues curve, the decline in demand exclusively affects output, while having no effect on the price, as the answers given by about 11% of respondents suggest. In this example, the drop in output to Y_2 causes a decline in marginal costs and, consequently, in average costs and total costs. Based on these assumptions, the example presented in chart 1 illustrates a set of measures survey respondents chose relatively often: output goes down in line with costs, while prices remain constant.

However, a large number of firms (about 40% of those that stated they

Chart 1

Effect of a Demand Shock on Output and Prices
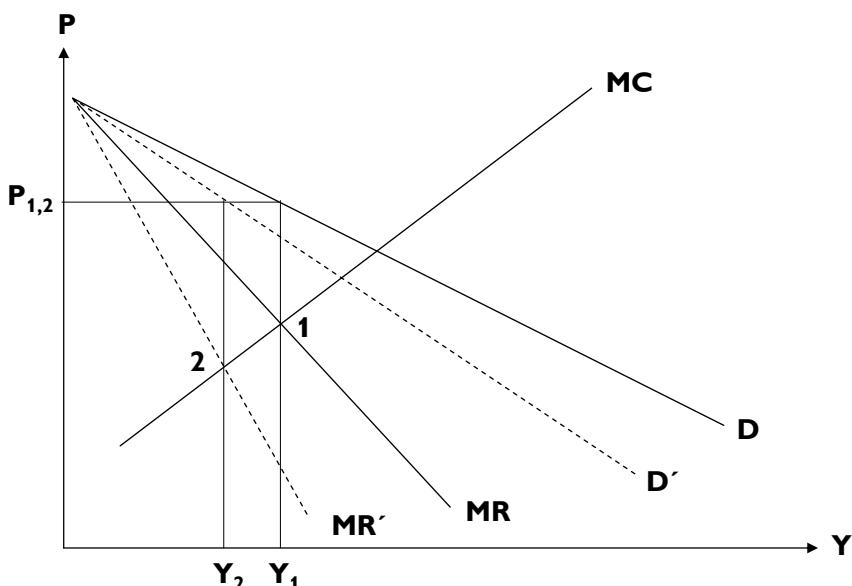
would reduce costs) also stated in the survey that they would reduce costs without simultaneously cutting back output. This applies, for example, to the set of measures ranking second in table 2, i.e. a combination of cutting costs, profit margins and prices. Chart 2 shows a possible interpretation of this case and indicates that here, in addition to the processes presented in chart 1, the marginal cost curve shifts to counter the decline in demand. This means that additionally, firms respond to a demand shock with a shift of the marginal cost curve (from MC to MC'), thus managing to prevent a drop in output and to continue to produce Y_1. In the example presented here, the price would drop from P_1 to P_3.

This result seems to contradict the hypothesis prevailing in the economic literature that companies are at their cost minimum at all times. Another interpretation of the picture this survey draws of firms may be that in times of crisis companies have cost reduction potentials which they do not, or cannot, normally exploit. For example, companies may use difficult economic conditions to negotiate new terms with suppliers or discuss cuts in labor costs with the staff council – options that may be available only in times of crisis or temporarily. This approach would have a corresponding shock-reducing effect on the output level.

On the assumption that not all companies interpreted a reduction of costs as a reduction of total costs (and thus as a synonym for reducing output; see chart 1) but that some companies would additionally opt for reduce their marginal costs (as illustrated in chart 2), this measure would also dampen the drop in output. In this case, output would decline, but not by as much as in chart 1, where a reduction of marginal costs is not factored in.

All in all, the results of this survey suggest that cost cuts represent a widely used measure in response to declines in demand. Insofar as cost cuts, at least in

Chart 2

Effect of a Demand Shock on Output and Prices with Simultaneous Reduction of Marginal Costs

2 How Firms Cut Costs

Those roughly 80% of firms that regard cost cuts as "highly relevant" and "relevant" in response to a demand shock were also asked in what way they would reduce costs. In the following, the answers to this question are analyzed.

2.1 Nonlabor Costs Dominate the Concept of Reducing Costs

Firms could choose from six response options, five of which focused on labor costs and one covered the collective term of nonlabor costs. Cost-cutting strategies referring to labor costs included reducing flexible wage components, cutting base wages, reducing working hours, discontinuing temporary employment contracts as well as dismissing parts of the core workforce. Respondents were asked to specify only their most important cost-cutting strategy. Table 3 gives an overview of the answers provided by Austrian firms and shows that, with an approval rate of 55%, cutting nonlabor costs is somewhat more common than cutting labor costs (45%).

In detail, about 15% of Austrian firms indicated that they would cut costs by reducing working hours, while around 13% of firms would cut flexible wage components. Close to 11% would dismiss parts of the core workforce in response to a demand shock, whereas roughly 6% would discontinue temporary employment contracts.

The results presented in table 3 are in line with a phenomenon that is widely discussed in the economic literature, namely that in response to a decline in demand firms would rather dismiss employees than cut their base wages. None of the 557 firms in the sample stated that they would cut base wages. This corresponds to the findings

Table 3

Relevance of Cost-Cutting Strategies

Possible strategy	Approval rate in %
Cut nonlabor costs	55.31
Cut working hours	14.90
Cut flexible wage components	12.55
Dismiss parts of the core workforce	10.91
Discontinue temporary employment contracts	6.33
Cut base wages	0.00

Source: WDN survey of firms.

of Agell and Lundborg (2003), who in 1998, following the most severe recession since the 1930s, asked Swedish firms whether they had reduced nominal wages in previous years. Out of 153 responding firms, only two stated that they had cut wages. Agell and Bennmarker (2007) also interviewed Swedish firms after the 1990s recession and arrived at the conclusion that only about 1% of employees covered by their sample had had to accept wage cuts. Accordingly, not even several years of high unemployment in Sweden (roughly 10% at the beginning of 1999) were able to make nominal wages more flexible. Such observations, as also described in Akerlof et al. (1996), bring up the question for the causes of downward nominal wage rigidity.

Bewley (1995, 1998, 1999) addresses this question by interviewing 372 persons professionally involved in hirings and dismissals and finds that by cutting wages, employers fear to hurt their employees' morale. Bewley's findings reveal that employers think an apparent fall in the standard of living and the insult implied by lower pay would result in a loss in loyalty toward the company. On the basis of these results, Howitt (2002) concludes that companies would consider cutting base wages only in cases of extreme financial difficulty.

Furthermore, Howitt argues that layoffs only hurt the morale of those leaving the company, while wage cuts have a lasting effect on the effort and productivity of remaining staff and, thus, on the firm.

In their study, Blinder and Choi (1990) come to a very similar result, also on the basis of interviews. They find that the noneconomic concept of fairness is better suited to explain wage rigidities than economic concepts, like e.g. implicit contracts. The interviewed firms stated that a wage policy that is perceived as unfair would raise staff turnover rates, dampen effort and lower the quality of future job applicants. However, Blinder and Choi emphasize that not every wage cut is necessarily regarded as unfair. There may be situations, e.g. when a firm faces bankruptcy, when wage cuts can be negotiated without further negative consequences.

Campbell and Kamlani (1997) asked 184 human resources managers by how much staff effort would be reduced if wages were cut by 10%. The average of answers was between 15% and 23% (depending on staff qualification) and here, too, respondents confirmed that in case of wage cuts, staff effort would go down more if the company was profitable than if it was making losses.

Table 4

Approval to Theories on Nominal Wage Rigidity

Firms avoid cutting base wages because …	Mean value	Approval rate in %	Alternative ranking
1 … base wage cuts reduce staff effort	3.36	91.40	1
2 … base wage cuts reduce staff morale	3.31	88.15	2
3 … collective agreements are in place	3.29	79.58	4
4 … the most productive employees would leave	3.25	85.58	3
5 … base wage costs increase staff turnover costs	3.10	78.86	5
6 … base wage cuts negatively affect the firm's image	2.99	70.85	6
7 … employees might feel they earn less than others	2.83	70.75	7
8 … implicit contracts are in place	2.29	43.95	8

Source: WDN survey of firms.

2.2 Fear of Eroding Staff Morale and Reducing Effort Prevents Wage Cuts

Within the scope of this survey, Austrian firms were also asked why they would avoid wage cuts. Respondents were presented with eight theories explaining downward nominal wage rigidities (for a summary of the results, see table 4).

Firms were asked to assign a score from 1 (irrelevant) to 4 (highly relevant) to each theory. Column 1 in table 4 gives an estimate of the mean value of all scores assigned, ranking the theories according to the average number of scores achieved. In an alternative ranking approach, ratings of 3 (relevant) and 4 (highly relevant) are interpreted as approval of a theory, whereas 1 (irrelevant) and 2 (of little relevance) are rated as disapproval. Column 2 in table 4 indicates the rate of approval by theory according to this alternative approach. Column 3 shows that ranking the theories in line with the alternative approach largely corresponds to ranking them by the mean value. However, the ranking itself shall not be overrated in the following interpretation of the results. The mean values of the theories with a top ranking lie within a very narrow band and, correspondingly, all theories reaching an average score of more than 3 or gaining the approval of almost 80% of respondents shall be deemed widely accepted explanations of nominal wage rigidities.

The findings summarized in table 4 basically confirm previous results found in survey literature. As in Campbell and Kamlani (1997), the theory on employees' effort (1), the thesis on employees' morale (2), the "adverse selection model applied to quits" (4) as well as the turnover model (5) obtain high rates of approval also in this survey. All these explanatory models belong to the family of efficiency wage theories. Apart from the traditional theories describing the reasons for wage rigidities, in Austria the institutional framework conditions, such as collective agreements (3), also appear to play a role in explaining wage rigidities.

The theory that wage cuts would reduce the employees' effort (1) recorded a 90% approval rate. The theory described in detail by Bewley (1995, 1998, 1999) that wage cuts reduce employees' morale (2) and, as a consequence, their effort finds similarly high acceptance with the respondents.

Almost 80% of firms agreed that collective agreements prevent wage cuts (3). In strictly contractual terms,

collective agreements can prevent wage cuts only in cases where the agreed minimum wages are being paid in the first place, as the collective agreement stipulates that wages must not fall below that level. However, it cannot be ruled out that firms' answers to this question also reflect the social pressure associated with collective wage agreements, which makes it difficult for them to cut wages while they are being raised in comparable firms.

Furthermore, the adverse selection model applied to quits (4) appears to be widely accepted. Around 86% of firms agreed that the most productive employees would leave the company following a wage cut. This conforms to the findings of Campbell and Kamlani (1997) who also report high approval rates for this theory. Thus, the adverse selection model provides another explanation for the question why firms prefer dismissals to wage cuts. While wage cuts cause the most productive employees to leave the firm, dismissals may be used selectively to lay off less productive employees. Finally, also the theory on increased staff turnover (5) receives an average score of more than 3, with the approval rate being just below 80%. According to this theory, firms are reluctant to cut wages because this would make more employees leave the firm and entail higher costs for hiring and training new staff. This theory, too, ranks high in Campbell and Kamlani (1997) as well as in Blinder and Choi (1990).

At an approval rate of about 70%, somewhat less relevance seems to be attributed to the thesis that wage cuts have a negative effect on a firm's reputation (6) and that hiring new staff would be more difficult in the future. The rate of approval to Keynes' (1936) argument that wage hierarchy is important for employees (7) points into the

same direction. According to this theory, employees oppose wage cuts that do not equally affect the overall distribution of wages.

Acceptance is found to be lowest for the theory of implicit contracts (8). Like the surveyed firms in Blinder and Choi (1990), only few Austrian firms (close to 44%) think that wage rigidities are caused by an implicit contract between firms and employees. According to the implicit contract, pay does not fluctuate with the business cycle and thus, risk-averse employees can keep their standard of living constant over the business cycle. The implicit contract would therefore prevent wage cuts in phases of low demand. While implicit contracts are important in explaining price rigidities in Austria, as described in Kwapil et al. (2005), they seem to have considerably less relevance for explaining wage rigidities.

2.3 Wage Cuts are Rare also in Other EU Countries

The survey results for the euro area and the full sample presented in table 5 confirm that – both in Austria and in other EU countries – companies rarely consider cuts in base wages. Across the full sample, 1.7% of companies stated that they would cut base wages following a demand shock.

While the results for the individual cost-cutting categories (table 5) are quite similar for Austria, the euro area as well as the full sample, the willingness to discontinue temporary employment contracts differs widely. In Austria, only about 6% of respondents indicate that they use temporary employment contracts to buffer costs following demand shocks. In the euro area, however, 30% of respondents agree to this question, while across the full sample agreement is at about 25%. These figures show that the use of temporary

Table 5

Cost-Cutting Strategies Across EU Countries

Possible strategy	Approval rate for		
	Austria	the euro area	the full sample
	%		
Cut nonlabor costs	55.31	35.83	39.07
Cut working hours	14.90	9.53	8.59
Cut flexible wage components	12.55	9.12	10.61
Dismiss parts of the core workforce	10.91	13.76	15.64
Discontinue temporary employment contracts	6.33	30.06	24.39
Cut base wages	0.00	1.70	1.70

Source: WDN survey of firms.

Note: Euro area data cover ten countries only. Data on Germany, Finland, Luxembourg, Malta, Slovakia and Cyprus are not included. The full sample comprises the ten euro area countries covered plus Estonia, Lithuania, Poland, the Czech Republic and Hungary.

employment contracts as cost-cutting instruments is far more frequent in other EU countries than in Austria.

Data on the share of temporary employees in the total labor pool suggest that this type of employment is neither really widespread in Austria in general nor in the firms questioned in this survey in particular. The Eurostat data in table 6 show that Austria, with a share of almost 9% of temporary employment contracts, is rather at the lower end among European countries. At more than 20%, the share of temporary employment is substantially higher in Portugal and Spain as well as in Poland. Since data on the share of temporary employment were also collected in the present survey, the "official" Eurostat data can be compared with

Table 6

Share of Temporary Employment in Total Employment

	Eurostat (annual data for 2007)	WDN survey of firms
	%	
Estonia	2.1	2.5
Lithuania	3.5	3.8
Hungary	7.3	5.9
Ireland	7.3	5.1
Belgium	8.6	2.7
Czech Republic	8.6	10.3
Austria	8.9	3.6
Greece	10.9	10.8
Italy	13.2	8.4
France	14.4	5.7
Netherlands	18.1	5.1
Slovenia	18.5	15.9
Portugal	22.4	22.4
Poland	28.2	19.7
Spain	31.7	18.9

Source: Eurostat, WDN survey of firms.

Table 7

Employment Protection Legislation (EPL) Index

	Temporary employment	EPL total
Czech Republic	0.5	2.0
Ireland	0.6	1.3
Hungary	1.1	1.7
Netherlands	1.2	2.3
Poland	1.3	2.1
Estonia	1.3	2.3
Austria	1.5	2.2
Italy	2.1	2.4
Slovenia	2.3	2.6
Lithuania	2.4	2.8
Belgium	2.6	2.5
Portugal	2.8	3.5
Greece	3.3	2.9
Spain	3.5	3.1
France	3.6	2.9

Source: OECD, Employment Outlook 2004; Tonin (2005).

Note: Data on the Czech Republic, Estonia, Slovenia and Lithuania from Tonin (2005).

firms' responses in this sample. Given varying degrees of coverage, however, the results do not fully coincide. While the Eurostat data cover the economy as a whole, this survey only covers sectors D through K. Still, the responses given in the WDN survey reflect the country ranking relatively well. Especially for Austria, however, there is a relatively big difference between the Eurostat data and firms' responses to the WDN survey. The firms in this sample indicated that an average of 3.6% of employees were employed on a temporary basis. According to this survey, only Estonia and Belgium report an even lower share. As the firms represented in the WDN sample seem to employ fewer temporary workers than the official numbers suggest, the data for Austria presented in table 6 may be distorted slightly downward.

It would seem obvious to blame the legal framework for the low level of temporary employment in Austria. In fact, quite the opposite seems to be true. According to the OECD indicator on the degree of regulation of temporary employment given in column 1 of table 7, Austria is among the OECD countries with the lowest degree of regulation in temporary employment. Within the euro area, only the legal frameworks of Ireland and the Netherlands offer more leeway in handling temporary employment contracts.

Overall, the legal framework on temporary employment does not seem to convincingly explain why this concept is so widely used in other EU countries. The overall index of Employment Protection Legislation (EPL) is generally assumed to deliver a better explanation. In countries where overall employment protection is generally strong (i.e. countries with a high index figure in column 2 of table 7), there seems to be a high demand for tempo-

rary employment. Accordingly, Bertola et al. (2009) find that in these countries temporary employees are indeed more likely to be laid off after a supply shock.

2.4 Relation between Firms' Characteristics and Cost-Cutting Strategies

Another question the survey deals with is which firms use which cost-cutting strategy. In this context it is of particular interest to see which firms cut labor costs or nonlabor costs and, if they choose the first option, whether they would rather reduce the quantity or the price of labor input. In other words, the question is which firms are more likely to dismiss employees and which ones would rather respond by cutting wages? The results presented in section 2.1 show that no firm in this survey would cut base wages in response to a decline in demand. Yet, about 13% of the firms surveyed reported that they would cut flexible wage components. Significantly more firms, i.e. a total of about 32%, cut costs by reducing the quantity of labor input (reduction in working hours or layoffs). Which type of firm chooses which cost-cutting strategy? Can we identify a pattern for Austrian firms?

In the following, we will examine whether deciding on a specific cost-cutting strategy depends mainly on the shape of the respective firm's production function or whether market characteristics, e.g. the intensity of competition, or the institutional framework also play a role. To analyze the effect of inputs in the production function, we proxy the capital-labor ratio by the share of labor costs in total costs. On average across all firms, labor costs account for roughly 37% of total costs. Also, the type of labor input may be relevant in explaining the choice of the cost-cut-

ting strategy. An important feature in this context is the distinction between blue- and white-collar workers. While blue-collar workers tend to do manual work (e.g. craftsmen or system and machine operators), white-collar workers are more frequently found in administrative jobs or as executives. The variable "share of blue-collar workers" in total staff is used to account for this characteristic. The average share of blue-collar workers in this sample is around 57%. Another important feature in analyzing the labor input is the type of contract. A firm that uses temporary employment contracts might rather dismiss temporary employees than the core workforce if there is a decline in demand. This question is examined by using the variable "share of temporary employees." As already mentioned, firms reported that an average of close to 4% of their total staff had temporary employment contracts.

Furthermore, we will also analyze the impact the competitive situation has on the decision as to which cost-cutting strategy to choose, using the variables "competition" and "export share." To map the price competitiveness of the firms surveyed, respondents were asked, as in Fabiani et al. (2006), to indicate on a scale from 1 ("very likely") to 4 ("very unlikely") whether they would lower their prices if their main competitor did so. In the following analysis, this information is described by a dummy variable: All firms that are very likely to follow their main competitor's price reduction are defined as being exposed to strong price competition (= 1) and the remaining firms, by definition, as facing only weak competition (= 0). The survey showed that, by their own account,

87% of firms experience rather weak price competition, while 13% can be regarded as price takers. The "export share" variable follows a very similar idea of price taking. The export share indicates how many percent of the respective firm's goods and services are sold outside Austria (26% on average). Firms with a high export share are deemed more likely to be price takers than firms that primarily operate in the domestic market. Since the correlation between the "competition" and "export share" variables is low, both will be used as exogenous variables in the following analysis.

To analyze whether the institutional framework on the labor market also has an impact on the type of cost-cutting strategies used, we take a look at the degree by which employment is covered by collective agreements. Firms were asked to indicate the share of employees whose employment contracts are covered by a collective agreement. The average coverage across the sample is roughly 95% and thus corresponds to the findings of Bönisch (2008), who finds collective agreement coverage rates of around 94%.[3] Beyond collective agreements, firms can negotiate internal wage settlements. To assess the impact of this type of wage negotiation, we use the variable "company agreement," defined as a dummy variable. The roughly 22% of firms that conclude such an internal wage agreement are coded 1, the remaining firms are coded 0.

Finally, the size of firms, the sector in which they operate and the economic situation at the time the survey was conducted are used as control variables. The size of a firm is equated with the number of employees which, on aver-

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[3] In his calculation of average collective agreement coverage rates, Bönisch (2008) also considers agriculture and forestry, which are not included in the present sample.

age across the sample, is about 206. In addition, we distinguish between six economic sectors (manufacturing, energy, construction, trade, other services and financial intermediation). Firms' economic situation was captured in the survey by a question on the development of total turnover against the previous year. Firms could choose from five categories of answers, ranging from sales being considerably higher to sales being considerably lower than the year before. Table 8 shows that the economic situation was satisfactory for most of the firms surveyed; less than 10% of firms faced declining sales.

Table 8

Development of Total Turnover in the Survey Year

	% of respondents
Considerably higher	24.17
Higher	45.20
About the same	21.96
Lower	6.46
Considerably lower	2.21

Source: WDN survey of firms.

To analyze the impact of firms' characteristics as well as of the competitive and institutional framework on the decision to cut costs after a demand shock, we estimate a multinomial logit model, whose results are presented in table 9. The values given represent marginal effects that indicate the change in probability that a specific cost-cutting strategy will be chosen if a specific characteristic increases by one unit. The last column of table 9 shows the point at which the marginal effects are evaluated. Usually, they refer to mean values, while in the case of categorical variables, the most common category served as point of reference.

The results presented in table 9 suggest that the share of labor costs in total

costs has a significant impact on choosing a cost-cutting strategy. A 10 percentage point increase in the share of labor costs would increase the probability that parts of the core workforce would be dismissed by about 2 percentage points. This means that in case of a demand shock, ceteris paribus, dismissals are more likely to take place in labor-intensive than in capital-intensive firms. Furthermore, firms with a high share of blue-collar workers and a low share of white-collar workers tend to reduce working hours and dismiss staff, whereas they are considerably more reluctant to cut nonlabor costs. An increase in the share of blue-collar workers by 10 percentage points would thus reduce the probability for cuts in nonlabor costs by about 3 percentage points. By contrast, the type of employment contracts (temporary vs. permanent) does not seem to have an effect on cost cuts, probably because temporary employment contracts play a minor role in Austria in general (section 2.3).

Firms' competitive situation also seems to have a certain influence on the decision as to which costs will be cut as a result of declining demand. While the effect of competition on the cost-cutting strategy is not significantly different from zero, export-oriented firms tend more toward cutting labor costs than nonlabor costs.

Table 9 also shows that neither collective agreements nor internal wage agreements have a significant impact on the probability of dismissals or wage cuts. While collective agreements have no impact on Austrian firms' cost-cutting strategies, the findings of Bertola et al. (2009), which are based on the same survey of firms but use data from 14 EU countries, show a strong correlation between collective agreements and cost cuts. If employment contracts are covered by collective agreements,

Table 9

Logit Estimation of Factors Influencing the Choice of Cost-Cutting Strategies (Marginal Effects)

	Cut flexible wage components	Cut working hours	Discontinue temporary employment contracts	Dismiss parts of the core workforce	Cut nonlabor costs	Values at which marginal effects are calculated
Share of labor costs in total costs	0.03	−0.13	0.04	0.19 **	−0.14	36.81%
	(0.07)	(0.10)	(0.04)	(0.09)	(0.16)	
Share of blue-collar workers	−0.01	0.17 **	0.01	0.09 ***	−0.26 ***	56.95%
	(0.04)	(0.07)	(0.02)	(0.04)	(0.09)	
Share of temporary employees	−0.08	−0.02	0.07	−0.05	0.09	3.91%
	(0.11)	(0.12)	(0.05)	(0.10)	(0.20)	
Export share	0.03	0.07	0.06 **	0.03	−0.19 **	25.58%
	(0.03)	(0.06)	(0.03)	(0.04)	(0.08)	
Competition (strong/weak)	−0.05 *	0.02	−0.00	0.03	0.01	Weak competition
	(0.03)	(0.06)	(0.02)	(0.04)	(0.08)	
Collective agreement (coverage rate)	−0.03	0.17	0.01	−0.03	−0.11	95.20%
	(0.05)	(0.17)	(0.02)	(0.05)	(0.16)	
Internal wage agreement (yes/no)	−0.03	0.03	0.00	0.01	−0.01	No agreement
	(0.02)	(0.05)	(0.01)	(0.03)	(0.07)	
Company size (number of employees)	0.00 *	−0.00 *	0.00	−0.00	0.00 **	206.16
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	
Economic situation	−0.01	0.02	0.01	0.00	−0.03	Higher turnover
	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	
Number of observations	304	304	304	304	304	
Pseudo log likelihood	−359.22	−359.22	−359.22	−359.22	−359.22	
Pseudo R^2	0.10	0.10	0.10	0.10	0.10	

Source: WDN survey of firms.

Note: The model includes sectoral dummies that are not reported. Rounded standard errors are given in parentheses. ***, (**), [*] denote significance at the 1%, (5%), [10]% level.

firms show a tendency to cut costs by dismissing temporary employees rather than by cutting wages.

Finally, Austrian firms prefer different types of cost-cutting, depending on the sector they operate in. Also, the firm's size seems to have a certain influence on the cost-cutting strategy. However, since both variables – size and sector – are intended to capture all the unobserved characteristics that are correlated with them but cannot be depicted by a separate variable, a detailed interpretation of the coefficients shall be omitted.

3 Summary

The results of the company survey indicate that about 80% of the firms surveyed in Austria cut costs in response to a demand shock. Usually this is not their only response to declining demand, firms tend to adopt packages of measures, one of which is cutting costs. A graphic interpretation of the survey results (charts 1 and 2) suggests that firms try to counter the drop in demand by reducing costs. Accordingly, cost cuts can be assumed to dampen the demand shock, with cuts in nonlabor costs being the dominant feature of cost cuts. While about 45% of firms reported that they would mainly cut labor costs, 55% indicated that they preferred reducing nonlabor costs in response to a demand shock.

Close similarity between Austria, the euro area and the full sample of EU countries is reflected in the phenomenon that, as a result of demand shocks, firms are more likely to dismiss work-

ers than cut their base wages. This phenomenon has already been widely discussed in the literature and a number of possible explanations have been found. In this survey successful theories explaining nominal wage rigidities were tested and firms were given eight different explanations for rigid wages to choose from. Among these theories, efficiency wage theories score particularly well with Austrian firms. In line with these theories, firms are reluctant to cut wages mainly because they fear a loss of staff effort and productivity as well as higher staff fluctuation and – subsequently – higher hiring and training costs.

There is a clear difference between Austria and the average of the other EU countries in the use of temporary employment contracts. By comparison, the number of temporary employment contracts concluded in Austria is significantly lower than in the other EU countries, which is why they are used significantly less often as cost buffers after demand shocks.

Finally, the survey results suggest that cost-cutting strategies are more likely to depend on firms' technology (labor intensity of production, share of blue-collar workers versus share of white-collar workers, sector, etc.) than on their institutional and economic environment (collective agreement, internal wage agreements, economic situation, etc.). In particular, labor-intensive firms with a high share of blue-collar workers are more likely to lay off employees in reaction to a demand shock and less likely to cut nonlabor costs. The same is true for export-oriented firms, which are also less likely to cut nonlabor costs. Moreover, the results of this study indicate that the wage rigidities depicted by collective agreements and wage agreements at the firm level do not have an influence on the probability of dismissals or other cost cuts that would be of relevance for the labor market.

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The Role of Exchange Rate Movements for Prices in the Euro Area

This study provides new evidence on the degree of exchange rate pass-through (ERPT) within the euro area after the launch of the euro up to the end of 2007. ERPT to import, producer, and consumer prices is estimated within a simple vector auto regression (VAR) framework. ERPT in the euro area is found to be broadly consistent with earlier studies in that it exhibits the following properties: ERPT (a) is incomplete; (b) decreases along the distribution chain; (c) might have slightly decreased; and (d) varies significantly across individual EMU member countries.

Paul Gaggl[1]

Both inflation and exchange rates within the EMU and its member states have been subject to significant volatility in the recent past. After the launch of the EMU in 1999, the euro depreciated constantly until 2001. Since then, it has appreciated continuously to reach its all-time high in early July 2008, most remarkably relative to the U.S. dollar. At the same time euro area inflation remained rather stable around the ECB's operating target of 2% until 2006, when prices in the euro area started to hike, peaking at an annual inflation rate of roughly 4%. Former ECB president, Willem F. Duisenberg, said in May 2000 that "... the depreciation of the exchange rate of the euro, until it is reversed, will increase the risks to price stability in the medium term. These risks have to be taken seriously in the light of the current strong upswing." Despite these exchange rate risks, euro area inflation remained stable until major energy price shocks in 2006 started pushing inflation to extreme heights. However, the euro was constantly appreciating during that time. A number of empirical studies tried to address President Duisenberg's concerns by investigating the so-called exchange rate "pass-through" to aggregate euro area

prices, i.e. the percentage change of prices in response to a 1% change in the exchange rate (Landolfo, 2007; Hahn, 2003; Anderton, 2003; Hüfner and Schröder, 2002). However, all of these studies mainly analyzed the era prior to the formation of the EMU and, therefore, only captured the relationship of the former euro area currency exchange rates with respect to aggregate prices of the corresponding member states.

The purpose of this study is to amend the existing literature and investigate the ERPT relationship of the euro area and some of its member countries after the launch of the euro, up to the end of 2007. Moreover, I want to highlight the influence of regional differences within the euro area by also quantifying the ERPT for a number of EMU member countries individually. This will allow me to relate my empirical results to various theories trying to explain cross country differences in the ERPT relationship.

The study is organized as follows: Section 1 outlines various theoretic explanations for the ERPT relation, section 2 summarizes existing empirical studies, section 3 presents the current empirical study, and, finally, section 4 concludes.

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1 Theoretic Explanations for ERPT

Since the breakdown of the Bretton Woods fixed exchange rate system in the 1970s, economists have eagerly searched for the implications of floating exchange rates for the conduct of monetary policy, the degree of macroeconomic stability, the transmission of international shocks, and the international balance of trade and capital flows. Among the most heated debates in the recent past is the degree of pass-through of exchange rate movements to goods prices in local currency. The earlier literature on ERPT during the 1980s focused mainly on cross-sectional evidence for particular industries or even product groups and was based on theoretic models of industrial organization and optimal price-setting of firms in the presence of at least some degree of market power.[2] This study focuses on the younger literature that specifically investigates the relevance of ERPT for the optimal conduct of monetary policy, which is best analyzed in open-economy stochastic dynamic general equilibrium (DSGE) models, often referred to as the so-called "New Open Economy Macroeconomics", initiated by the seminal work of Obstfeld and Rogoff (1995).[3]

Among others, two of the most interesting stylized facts about ERPT worth investigating are first, incomplete, i.e. less than one for one, pass-through to import prices; and second, even lower degrees of ERPT to producer and consumer prices. Further,

there seems to be evidence not only for incompleteness but also for a further decline in ERPT over time; and, at the same time, significant differences across countries in the response of price levels to exchange rate movements.[4] In the basic Obstfeld and Rogoff (1995) setup, firms set their prices in their home currency (producer currency pricing – PCP) but cannot change their prices at every point in time.[5] Therefore, at least in the short run, the import prices in the buyer's currency have to absorb the exchange rate movements, since export prices in the producer currency remain fixed even in the presence of exchange rate movements. Hence, in the basic Obstfeld and Rogoff (1995) setup there is complete ERPT. Devereux and Engel (2002), however, show that this tight link can be broken by considering that exporting firms set their prices in the local currency of the buyer (local currency pricing – LCP). In their model, prices are rigid in the local currency of the buyer, which has the effect that exchange rate movements do not affect goods prices in the importing country in the short run. This model is the other extreme, where ERPT is not present at all. Devereux et al. (2004) combine the two specifications and allow firms to choose the currency in which they want to price their products. Not only is their model able to explain low degrees of ERPT, but it also establishes an interesting prediction about the relation between the stability of monetary policy and the

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[2] See surveys by Goldberg and Knetter (1997) and Menon (1995) on the theory and empirics of ERPT with a focus on industry and product level studies.

[3] See Lane (2001) for a recent survey on new open economy macroeconomics.

[4] Empirical evidence for these stylized facts is discussed in section 2 as well as section 3.

[5] The assumption of so-called sticky prices is based on strong empirical evidence that firms do not change their prices very frequently. See Bils and Klenow (2004) for the United States and Fabiani et al. (2006) for European evidence.

degree of ERPT: Countries with relatively stable money growth will have relatively low pass-through rates. This highlights a link between ERPT and monetary policy, which is analyzed by Corsetti and Pesenti (2005). They find that the degree of ERPT is key in the design of optimal monetary policy. While countries with low as well as very high ERPT are best off conducting a monetary policy that aims at stabilizing the home economy, countries with intermediate degrees of ERPT would gain from international policy coordination, i.e. a monetary policy that focuses not only on stabilizing the domestic economy but one that also takes into account the trading partners' economic stability. Similarly, Sutherland (2005) shows that in the presence of incomplete ERPT the coordinated policy outcome, as advocated by Corsetti and Pesenti (2005), can be supported by individual monetary policy based on maximization of an appropriately defined welfare function. This welfare criterion is shown to depend on the second moments of home and foreign producer prices as well as the nominal exchange rate. The weight on the exchange rate depends on the degree of pass-through, the size of the economy and the elasticity of labor supply. Therefore, the degree of ERPT is potentially relevant for the optimal conduct of monetary policy, independent of the degree of international policy coordination.

While the models discussed above provide a theoretical foundation for the low degree of ERPT to aggregate prices in the importing country, they cannot explain why consumer prices react a lot less to exchange rate fluctuations than

producer or import prices at the border. However, the class of PCP models, as advocated by Obstfeld and Rogoff (2000a), in combination with either some degree of "local value added," such as local retail services, shipping etc., or the assumption that only intermediate goods are imported can also explain low rates of ERPT. An additional advantage, though, is that this strand of PCP models can also account for different degrees of pass-through at different stages of the distribution chain.[6] The former approach is proposed by Obstfeld and Rogoff (2000b), who model transportation and local distribution services as an additional cost for imported goods. This has the effect that even when imported and locally produced goods are virtually perfect substitutes, individuals will choose to consume fewer foreign goods, which introduces a bias to locally produced goods. This market segmentation has the effect that imported goods do not play that much of a role for the local CPI, and hence, fluctuations in exchange rates do not fully pass through to consumer prices. Similarly, Burstein et al. (2003) as well as Hellerstein (2008) explain declining ERPT along the distribution chain by explicitly considering a local distribution sector which optimally adjusts markups in response to changes in its cost structure.

McCallum and Nelson (1999) as well as Bacchetta and van Wincoop (2003) take the alternative approach and assume that imported goods are intermediate goods. The motivation for this approach is that most of the goods sold in a particular country are a combination of imported intermediate

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[6] Further, Obstfeld and Rogoff (2000a) argue that LCP models are not consistent with stylized facts about the relation between the terms of trade and exchange rates.

goods and locally produced goods. As soon as the proportion of imported intermediate goods within a final consumer good is low, exchange rate fluctuations, which only influence the import price for intermediate inputs, are not fully passed through to consumer prices. In particular, Bacchetta and van Wincoop (2003) assume that only intermediate goods are traded and final consumption goods are not traded at all. They show that a likely equilibrium is one where firms exporting intermediate inputs set their prices in producer currency (PCP), and the final goods producers post their prices in local currency (LCP). Hence, in their model, the existence of a large enough nontraded goods sector plays a crucial role for achieving complete pass-through to import prices but incomplete pass-through to final goods prices.

A last piece of evidence with respect to ERPT that economists try to explain is a possible decline over time in the pass-through relation. Jeanfils (2008) combines the assumptions of nontraded goods, staggered price-setting, a local distribution sector, and an endogenous variable demand elasticity, to explain all of the above-mentioned stylized facts in one model. The crucial additional assumption is a variable demand elasticity. Bergin and Feenstra (2001) show that a model with staggered price-setting and translog preferences (variable demand elasticity) can account for incomplete ERPT and a significant degree of persistence in the real exchange rate. A variable demand elasticity gives firms the possibility to conduct optimal price discrimination by varying their markups instead of prices, when exchange rate shocks hit the economy.

2 ERPT prior to the EMU

ERPT for EMU member countries and the euro area prior to the introduction of the euro has been analyzed in multiple studies. The results of these studies are summarized in the top panel of table 1. Hüfner and Schröder (2002) are the first to explicitly analyze ERPT in the euro area by estimating ERPT for France, Germany, Italy, the Netherlands, and Spain individually and then aggregate the coefficients to receive a crude proxy of euro area ERPT. They use cointegration analysis and a vector error correction model (VECM) to capture the dynamic component of ERPT and to account for the non-stationarity of several variables. In a similar study Hahn (2003) employs a vector auto regression (VAR) model similar to McCarthy (2000, 2007); however, she is the first to use aggregate euro area data. Anderton (2003) conducts time series and panel regressions for the euro area's most important import suppliers (U.S.A, Japan, the non-Japan Asia region, U.K., Sweden, Denmark and Switzerland). The most recent study of aggregate ERPT to euro area prices is the structural analysis by Landolfo (2007). He estimates various specifications of dynamic simultaneous equation models, which differ from VAR analysis in that they explicitly include exogenously given relations between some of the endogenous and additional exogenous variables.

The bottom panel of table 1 shows previous estimates of ERPT to import and consumer prices for individual countries. The differences for the individual estimates can mainly be attributed to different econometric methodology. The biggest difference can be seen between studies using panel and cross-section regressions (Campa and Goldberg, 2005 and 2006) and those applying VAR or VECM specifications

Table 1

Euro Area Exchange Rate Pass-Through Prior to EMU

Euro Area

	Hüfner and Schröder (2002)		Hahn (2003)		Anderton (2003)		Landolfo (2007)	
	short-run	long-run	short-run	long-run	short-run	long-run	short-run	long-run
Import Prices[1]	×	×	0.700	0.690	0.50−0.70	×	0.580	0.670
Consumer Prices[1]	0.040	0.080	0.087	0.212	×	×	0.086	0.148

Country Comparison

	Hüfner and Schröder (2002)		McCarthy (2007)		Campa and Goldberg (2006)		Campa and Goldberg (2005)	
	short-run	long-run	short-run	long-run	short-run	long-run	short-run	long-run
Import Prices[2]								
Germany	×	×	~0.8	~1.0	0.66	0.76	0.55	0.80
France	×	×	~0.8	~0.8	0.68	0.83	0.53	0.98
Italy	×	×	×	×	0.74	0.94	0.35	0.35
Netherlands	×	×	~1.1	~2.1	0.69	0.79	0.79	0.84
Austria	×	×	×	×	0.37	0.46	0.21	0.10
Consumer Prices[1]								
Germany	0.07	0.10	~0.1	~0.2	×	×	×	×
France	0.01	0.16	~−0.1	~−0.2	×	×	×	×
Italy	0.06	0.18	×	×	×	×	×	×
Netherlands	0.12	0.11	~0.3	~0.4	×	×	×	×

Source: Cited studies.

[1] *For euro area comparisons and consumer prices in the bottom panel (country comparison), short-run refers to the response after one year and long-run to the response after three years.*

[2] *For import prices in the bottom panel (country comparison), short-run refers to the response after one quarter and long(er)-run to the response after four quarters since Campa and Goldberg (2005) only include four lagged variables in their estimation.*

(McCarthy, 2007; Hüfner and Schröder, 2002).

Even though the individual estimates vary slightly across studies, one can summarize the following general patterns: Exchange rate pass-through is (a) incomplete, (b) significantly decreases along the distribution chain, and (c) varies significantly across EMU member states.

3 ERPT in the EMU

The main goal of this paper is to explain the effect of exchange rate movements on aggregate import, wholesale and consumer prices within the EMU. Since I focus on magnitude and speed of price adjustment in response to exchange rate shocks, I employ VAR techniques following Christiano et al. (1996), first used in the context of ERPT by McCarthy (2000 and 2007).[7] In particular, I specify the model

$$y_{i,t} = E_{t-1} y_{i,t} + \Gamma_i \varepsilon_{i,t} \qquad (1)$$

where $y_{i,t}$ is a 7×1 vector of endogenous variables, $(\pi_{i,t}^{oil}, \tilde{y}_{i,t}, \Delta e_{i,t}, \pi_{i,t}^{m}, \pi_{i,t}^{w}, \pi_{i,t}^{c}, r_{i,t})$'; the k×1 vector $\varepsilon_{i,t}$ consists of exogenous shocks; and Γ_i is a k×k coefficient matrix capturing the contemporaneous rela-

[7] *Christiano et al. (1996) discuss a VAR model's ability to identify a causal relation between a monetary policy shock (an exogenous shock to the U.S. federal funds rate) and main U.S. economic indicators. The same discussion applies here, for the case of an exogenous exchange rate shock and its impact on various price measures. In particular, this approach critically hinges on assumptions about the contemporaneous relations between the endogenous variables included in the VAR, which are discussed below.*

tions between the endogenous variables. The variables of prime interest are $\pi_{i,t}^m$, $\pi_{i,t}^w$, and $\pi_{i,t}^c$, which correspond to import, wholesale, and consumer price inflation in country i at time t, respectively. I consider the following $k = 7$ exogenous shocks for each country i: A supply shock, $\varepsilon_{i,t}^s$; a demand shock, $\varepsilon_{i,t}^d$; an exchange rate shock, $\varepsilon_{i,t}^e$; as well as direct shocks to each set of prices, $\varepsilon_{i,t}^m$, $\varepsilon_{i,t}^w$, and $\varepsilon_{i,t}^c$; and finally, a monetary policy shock, $\varepsilon_{i,t}^{mp}$. In order to identify all these exogenous disturbances, I add the following endogenous variables: Oil price inflation, $\pi_{i,t}^{oil}$, to identify supply shocks; output gaps, $\tilde{y}_{i,t}$, to account for demand shocks; exchange rate changes, $\Delta e_{i,t}$, to pin down exchange rate shocks; and, finally, interest rates, $r_{i,t}$, to capture monetary policy reactions. The symbol E_{t-1} represents expectations conditional on information up to the end of period $t-1$.

The simple econometric specification in equation (1) expresses the idea that today's economic indicators, $y_{i,t}$, are people's expectations based on information available last period, $E_{t-1}y_{i,t}$, disturbed by random exogenous innovations, $\varepsilon_{i,t}$, which were unpredictable given the information at time $t-1$. Assuming that agents form their expectations using a vector auto regression, I can proxy the system (1) by the recursive reduced form VAR(q_i)

$$y_{i,t}^* = A_i y_{i,t}^* + \Gamma_i^* \varepsilon_{i,t}^* \qquad (2)$$

where A_i is the companion coefficient matrix of the VAR(q_i); and variables with a superscript asterisk, x^*, are appropriate transformations of the corresponding variable $x \epsilon \{y_{i,t}, \Gamma_i, \varepsilon_{i,t}\}$ in order to represent the system as a companion

VAR(1). In what follows I will use impulse response functions to capture the effect of exchange rate changes, $\Delta e_{i,t}$, on the various price indices, $\pi_{i,t}^m$, $\pi_{i,t}^w$, and $\pi_{i,t}^c$. Exchange rate shocks are identified using a Cholesky decomposition of the estimated variance covariance matrix $\hat{\Omega}_i = \hat{\varepsilon}_{i,t} \hat{\varepsilon}_{i,t}'$ in combination with the specific Wold ordering $\{\pi_{i,t}^{oil}, \tilde{y}_{i,t}, \Delta e_{i,t}, \pi_{i,t}^m, \pi_{i,t}^w, \pi_{i,t}^c, r_{i,t}\}$. As long as exchange rates cannot contemporaneously influence supply and demand and the various price indices and short-term interest rates cannot instantaneously affect exchange rates, the chosen recursive ordering uniquely identifies exogenous exchange rate innovations, $\varepsilon_{i,t}^e$, (Keating, 1996).

3.1 Data

To quantify the degree of exchange rate pass-through for the euro area, I use a sample of five EMU member countries: Austria, Germany, France, Italy and the Netherlands, as well as the euro area (12 countries) in the aggregate. All variables are measured at monthly frequency ranging from January 2000 to December 2007.[8] Exchange rates, $e_{i,t}$, are represented by nominal effective exchange rate indices provided by Eurostat (trade weighted for 41 trade partners including the 27 EU countries and 14 extra-EU countries). Import price inflation, $\pi_{i,t}^m$, is proxied by the percentage change in import unit values (trade value divided by trade volume) provided by the OeNB. For Germany and the Netherlands I use import price indices provided by Germany's Federal Statistical Office and by Eurostat, respectively, which are a less noisy measure of import

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[8] *While all price and exchange rate measures are available for the time period January 1995 to December 2007, my measure of industrial production for Austria is only available from January 2000 onward. Therefore, for consistency reasons, I start my VAR analysis in January 2000 rather than January 1999, when the euro was introduced. Table 2 in the annex includes a detailed list of all the data sources used in this study.*

prices than unit values.[9] Producer price indices provided by the OECD are employed to compute inflation of wholesale prices, $\pi_{i,t}^{w}$. Consumer price inflation, $\pi_{i,t}^{c}$, is represented by percentage changes in the HICP, provided by Eurostat. I compute output gaps, $\tilde{y}_{i,t}$, by taking the difference between the index of monthly industrial production provided by Eurostat and an HP-filtered trend ($\lambda = 14,400$). The oil price measure, $\pi_{i,t}^{oil}$, is the crude oil price in USD/barrel provided by the IMF. Finally, I use monthly averages of day-to-day money market interest rates for the euro area provided by Eurostat as the measure of the monetary policy instrument, $r_{i,t}$. If necessary the series are seasonally adjusted using the U.S. census bureau X12 procedure as implemented in the computer software *EViews*.

Chart 1 shows the nominal effective exchange rate for the euro area and the selected five member countries.

One can see that after the launch of the euro in 1999 the euro strongly de-preciated until the end of 2000 and appreciated on average thereafter. All the individual effective exchange rates closely follow the euro area exchange rate and mainly differ in terms of magnitude but not in terms of volatility.

Chart 2 shows the price indices at the different stages of distribution.

One can see that import prices vary the most, followed by producer prices and consumer prices. This is a first indicator that the effect of exogenous shocks decreases along the distribution chain of prices. Moreover, one can see in chart 2 that the ranking among EMU member countries in terms of average price level changes along the distribution chain. France, for instance, appears to have the second-lowest import prices on average, the lowest producer prices but the third-lowest consumer prices. This already suggests that differences in industrial composition and organization across EMU member states seem to matter for the effect of exogenous disturbances to prices at the different stages of the pricing chain. For Germany
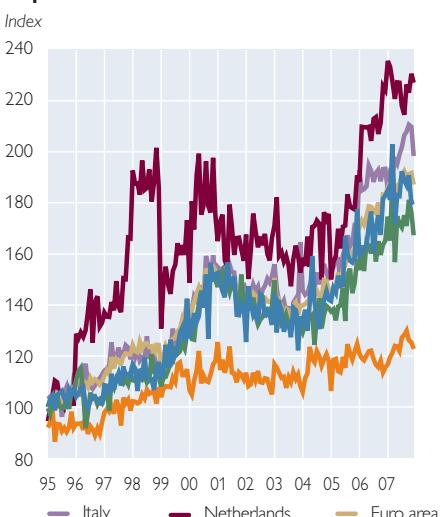
Chart 1

Nominal Effective Exchange Rate

Source: Eurostat.

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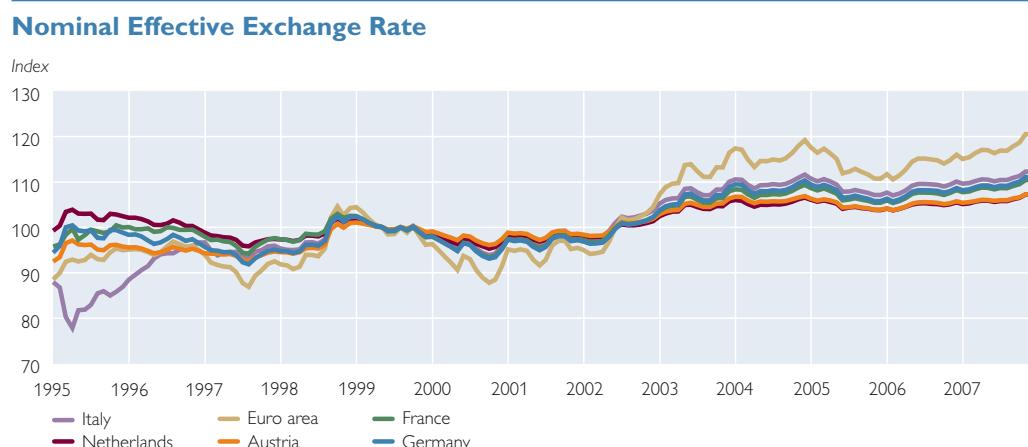
[9] *See a report by the General Accounting Office (1995), which illustrates how both measurement and aggregation errors contribute to significant noise in unit value measures in the United States. Also Hallak and Schott (2008) provide a detailed discussion of differences between import price indices and unit values.*

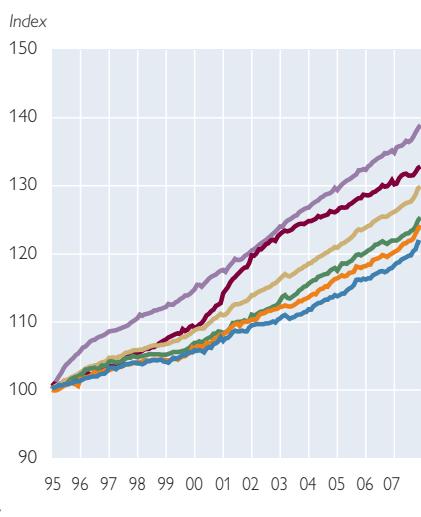Chart 2

Price Measures − Country Comparison

Import Prices
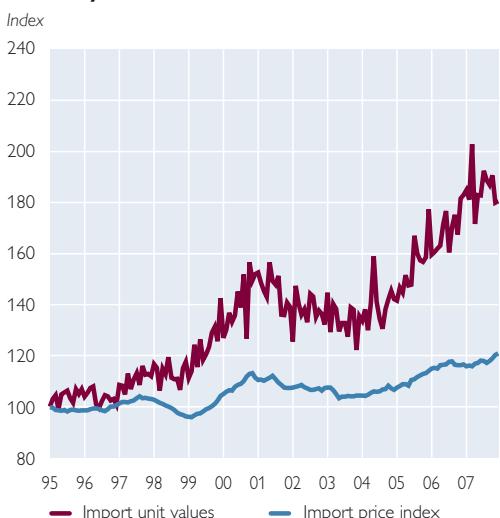
Index

Producer Prices

Index

Consumer Prices

Index

Italy — Netherlands — Euro area — Austria — France — Germany

Source: Eurostat, OECD, OeNB.

Chart 3

Import Price Measures − Unit Values versus Import Price Index

Germany

Index

Netherlands

Index

Import unit values — Import price index
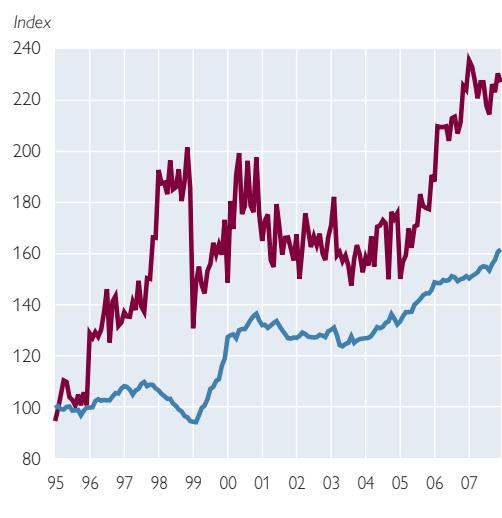
Source: Eurostat, Federal Statistical Office, OeNB.

and the Netherlands there are import price indices available which, compared to the unit values, are a lot smoother, as can be seen in chart 3. However, the less volatile price indices display the same general pattern over time, as unit values and also preserve the decrease in volatility of prices along the distribution chain, as mentioned above. In principle, it would be preferable to have import price indices for all countries, but the import unit values used for the remaining countries in my sample are the only data on import prices for EMU

member countries available in monthly frequency for the time period past 2002.[10]

3.2 Empirical Results

The results presented in this section were computed using the model described at the beginning of section 3. The sample period is January 2000 to December 2007. All countries are estimated as VAR(1) models in accordance with the AIC_c lag length criterion.[11] Exchange rate pass-through is illustrated by impulse response functions, displaying the response of prices over three years (36 months) following a 1% permanent nominal effective appreciation.[12] The solid line in each chart represents the estimated impulse response, while the dashed lines correspond to two standard error confidence intervals around each point forecast.

3.2.1 Import Prices

Like in earlier studies, the ERPT in the euro area is incomplete on every stage of the price chain (Landolfo, 2007; Hahn, 2003; Anderton, 2003; Hüfner and Schröder, 2002). Chart 4 shows that exchange rate movements are significantly passed through to import prices within the first year after an exchange rate shock, peaking after about one quarter. In the short run about 60% and in the long run about 30% of an exchange rate shock are passed through to euro area import prices. Taking into account the considerable uncertainty associated with the estimated responses, this is consistent with the only euro area evidence by

Hahn (2003), Anderton (2003) and Landolfo (2007), who estimate short-run ERPT to import prices of 50% to 70%. In the long run, my estimates are slightly lower, which suggests a mild reduction in the degree of euro area ERPT relative to the pre-EMU era.

Looking at cross-country comparisons, for Germany and the Netherlands – whose estimates are based on import price indices rather than unit values – one can see a significant pass-through within one year, peaking during the first two quarters after the shock. The estimated degrees of ERPT are broadly consistent with previous studies (McCarthy, 2007; Campa and Goldberg, 2005 and 2006). Notice however, that, in the long run, my estimates seem to be significantly lower than those estimated by McCarthy (2007), who uses the same econometric methodology. Further, it is worth noting that the larger of the two countries, Germany, exhibits degrees of ERPT more similar to the euro area average while the Netherlands are far above average. The impulse responses for all the remaining countries (Austria, France and Italy) should be interpreted with caution. Their respective response coefficients are very imprecisely estimated, most likely due to the considerable noise in the highly volatile unit value measures.

Overall, the observation that my more recent estimates seem to reveal slightly lower pass-through than earlier studies is in line with the theory advocated by Taylor (2000), who argues that in the presence of a more stable monetary environment, like EMU,

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[10] As of 2009, Statistics Austria has been publishing an import price index for Austria (www.statistik.at/web_en/ statistics/Prices/import_price_index/index.html). At the cutoff date for this study, however, this index was not yet available.
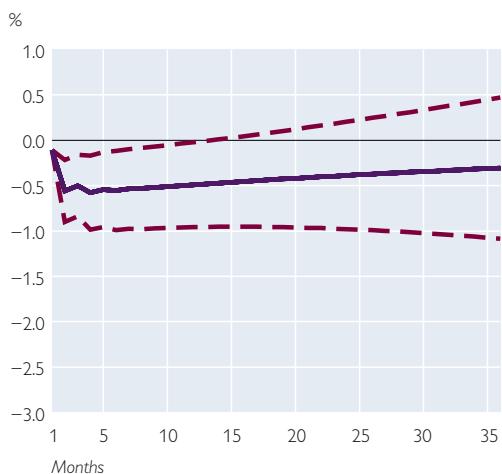
[11] This information criterion is a small sample correction of Akaike's information criterion (AIC) as suggested by Hurvich and Tsai (1993).

[12] Technically, this is accomplished by plotting the accumulated response of import, producer, and consumer price inflation to a temporary (one-period) 1% innovation to the change in exchange rates.
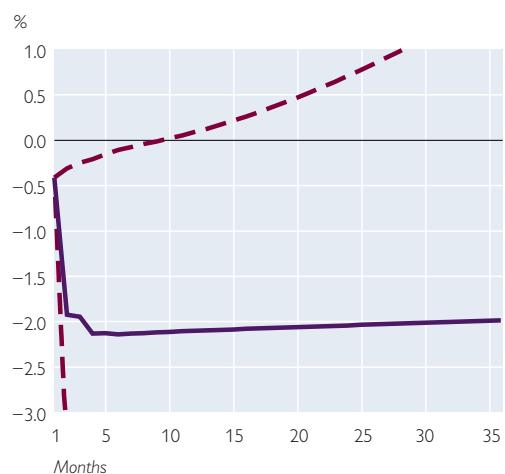
Chart 4

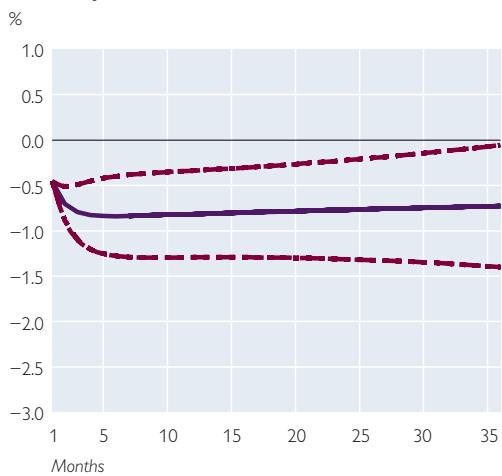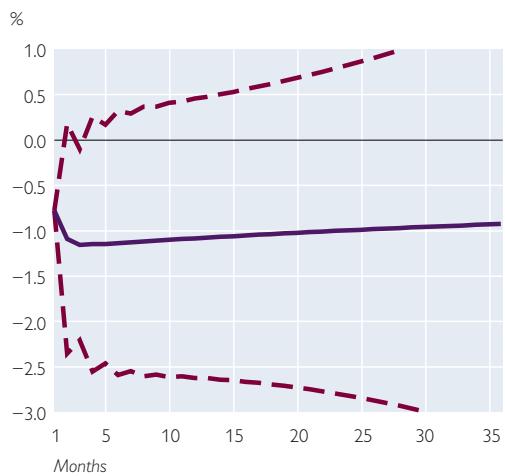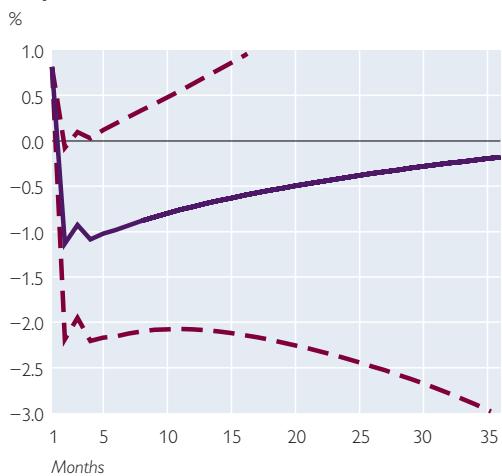## Exchange Rate Shock − Import Prices

Euro area

%

Months

Austria

%

Months

Germany

%

Months

France

%

Months

Italy

%

Months

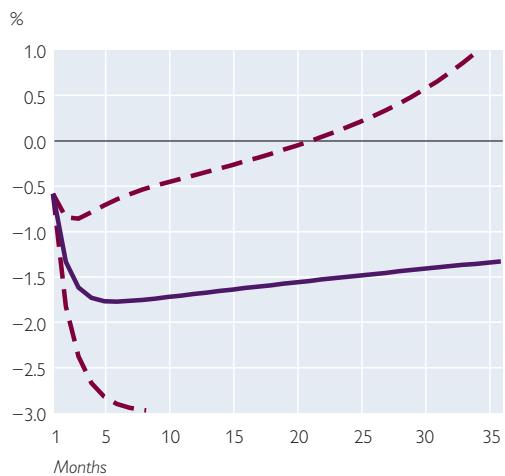**Netherlands**

%

Months

- - - Standard error confidence ——— Impulse response

Source: Author's calculations.

Note: The chart illustrates the accumulated response of $\pi_{i,t}^m$ to 1% innovations to $\Delta e_{i,t}$. The dashed lines represent two standard error confidence bands computed with 5,000 residual bootstrap replications.

there should be a lower degree of ERPT. This finding is also consistent with Marazzi et al. (2005), who find a strong decline of ERPT to U.S. import prices over the last 20 years. They attribute the U.S. evidence of a declining ERPT mainly to two possible explanations: First, there seems to be evidence for a shift in demand toward goods that are less commodity-intensive and hence less sensitive to exchange rate movements. Second, China's fixed exchange rate policy together with an increased presence of China's exporters in the U.S. market appears to have played a role. Since the current study is based on aggregate data only, I cannot directly address these conjectures. However, it is likely that, on top of the more stable monetary environment in EMU, forces similar to the ones discussed by Marazzi et al. (2005) contribute to the decline in ERPT in the euro area.

3.2.2 Producer Prices

Chart 5 illustrates that the pass-through of exchange rate shocks to producer prices is considerably less significant than ERPT to import prices. ERPT for the euro area is significant for about half a year and reaches its maximum after about six months. This indicates that pass-through to producer prices is slower than for import prices, which show the strongest reaction within the first quarter. Further, the maximum pass-through is about 10% after six months and only about 5% in the long run, while import prices showed a long-run pass-through of roughly 30% and peaked at about 60%.

ERPT in the individual EMU member countries varies considerably. While there is no significant pass-through to Austrian, German, French and Italian producer prices after one month, there is a significant effect on the producer price index (PPI) in the

Netherlands for about half a year. The maximum degree of pass-through in the Netherlands is about 80% after half a year, while all the other countries (except for France) show ERPT between 3% and 7% in the first month but no statistically significant pass-through after one month. Furthermore, France shows the wrong sign, which is also the case in McCarthy (2007). The findings for producer prices, again, are consistent with the theory that ERPT in (economically) larger countries, like Germany, is closer to the euro area average. Smaller countries, like the Netherlands, appear to exhibit more than (euro area) average ERPT.

3.2.3 Consumer Prices

Statistically, consumer prices in the euro area, as well as in all of the individual EMU member countries investigated, do not respond to an effective exchange rate appreciation of the euro, as highlighted in chart 6. This result is consistent with most of the existing VAR-based ERPT studies, which observe either very small or no significant ERPT to consumer prices (McCarthy, 2007; Hahn, 2003; Anderton, 2003; Hüfner and Schröder, 2002). For consumer prices, the Netherlands deliver the odd result that an effective appreciation results in a slight increase in prices during the first month, which is a phenomenon that McCarthy (2007) also observes for some OECD countries.

4 Conclusion and Discussion

This study provides new evidence for exchange rate pass-through in the euro area since the introduction of the euro up to the end of 2007. The empirical results are broadly consistent with the existing empirical evidence, which is a sign for a rather stable relationship between exchange rate movements and
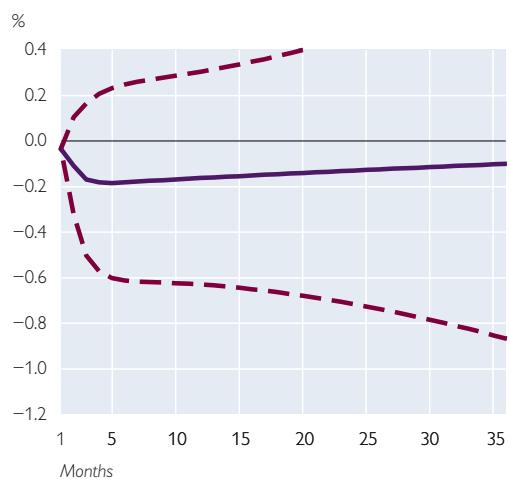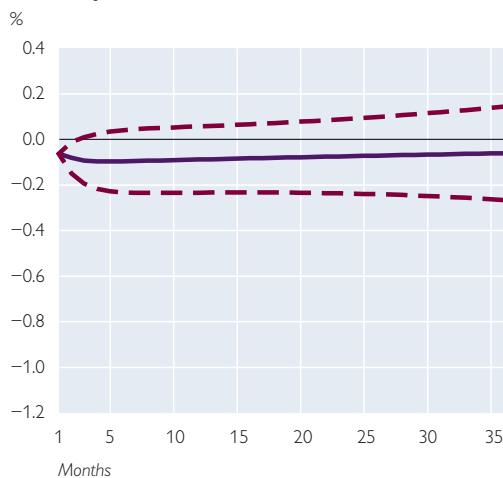
Chart 5

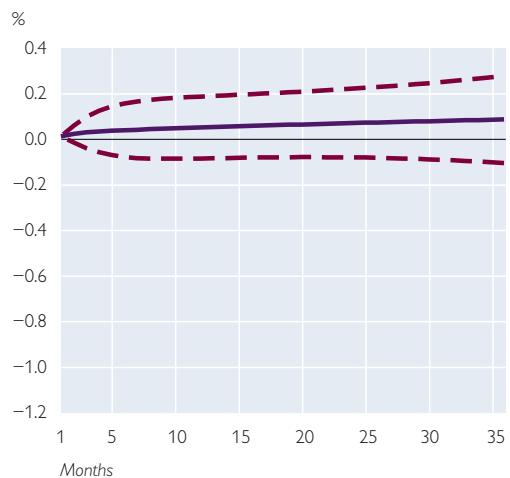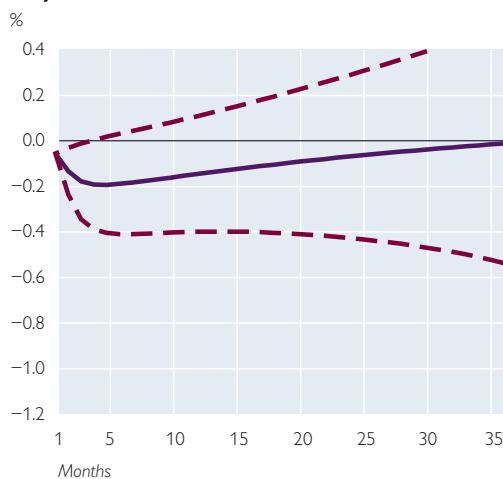## Exchange Rate Shock − Producer Prices

Euro area
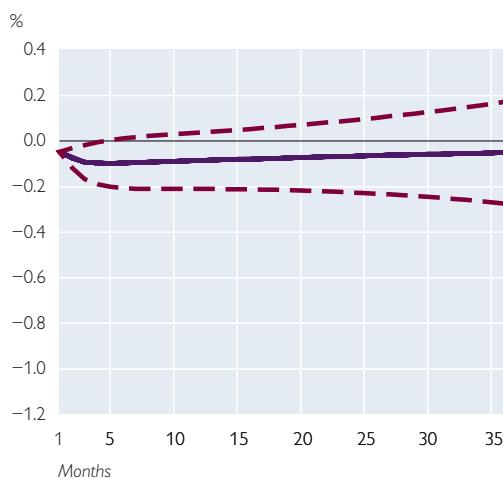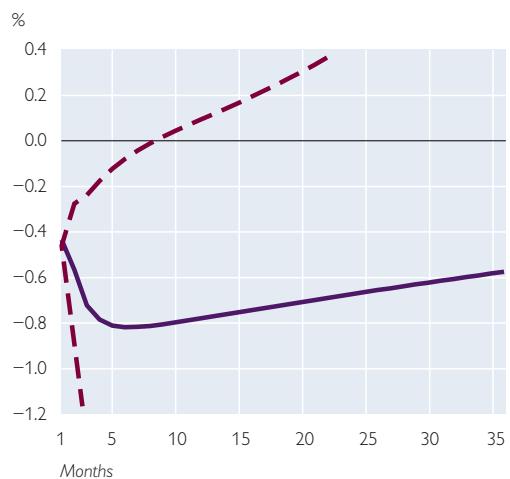
%

Austria

%

Germany

%

France

%

Italy

%

Netherlands

%

- - Standard error confidence ——— Impulse response

Source: Author's calculations.

Note: The chart illustrates the accumulated response of $\pi_{i,t}^w$ to 1% innovations to $\Delta e_{i,t}$. The dashed lines represent two standard error confidence bands computed with 5,000 residual bootstrap replications.

Chart 6

Exchange Rate Shock – Consumer Prices

Euro area
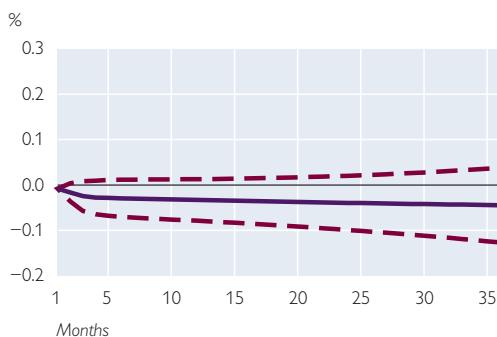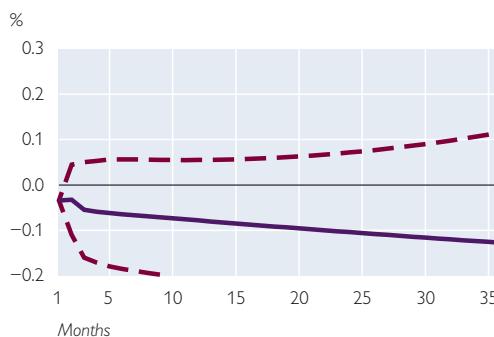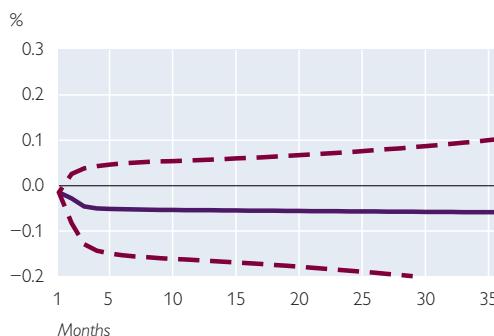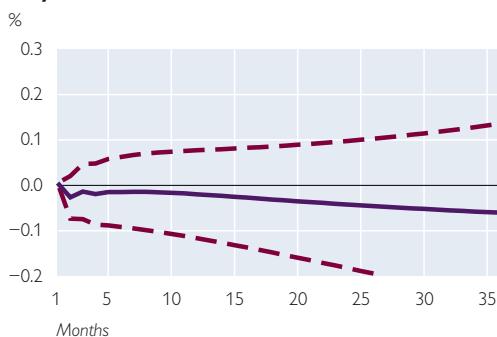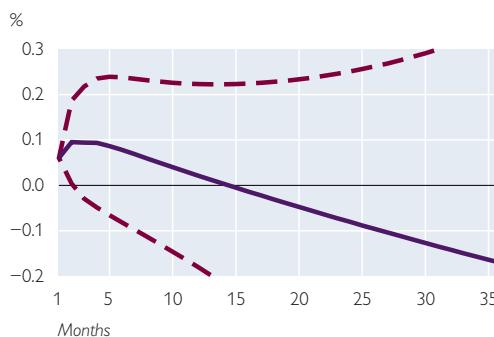
Austria

Germany

France

Italy

Netherlands

- - - Standard error confidence —— Impulse response

Source: Author's calculations.

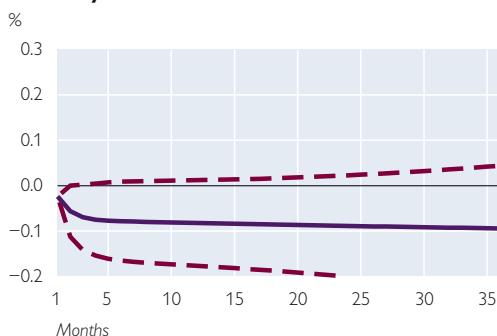*Note: The chart illustrates the accumulated response of $\pi^c_{i,t}$ to 1% innovations to $\Delta e_{i,t}$. The dashed lines represent two standard error confidence bands computed with 5,000 residual bootstrap replications.*

price adjustment in the euro area. Even though all the estimates are very imprecisely estimated, one can see a very mild decline in ERPT in the euro area relative to earlier studies. Taylor (2000) argues that such a decline could be explained by a more stable monetary environment, such as provided by the euro. Apart from the slight decline, the qualitative findings are identical to the earlier empirical literature. ERPT is strong (up to 60% in the euro area) for import prices, rather weak for producer prices, and barely noticeable for consumer prices. There are various theories that can explain this phenomenon, among them the existence of a large nontraded sector or a large degree

of local value added through retail and distribution services. Looking at the euro area as a whole, one could argue that the large proportion of intra euro area trade serves as a large nontraded sector.

Cross-country comparisons reveal that there is a significant degree of heterogeneity among EMU member countries, which results in quite different degrees of ERPT. There are various reasons which could lead to those differences, such as country size, the degree of openness, or sectoral composition of individual EMU member states. The cross-country comparisons in this study have to be treated with caution, though. First, the strongest ERPT is observed for import prices, which for most countries were proxied with import unit values. These unit values are a very noisy measure and hence produce very imprecise results. Second, all the price indices used incorporate goods that are traded both within and outside of the euro area. On the one hand, this is a possible theoretical explanation for very low degrees of ERPT, especially at the consumer level. On the other hand, the estimates incorporate two distinct effects which cannot be separately identified. First, a direct effect from trade with a particular currency area and second, an indirect effect through intra-euro area

trade at a one-to-one exchange rate with countries that are again trading partners with the same country. It would be interesting to isolate the two effects to investigate the cross-country differences in the importance of the direct and the indirect effect.

This study is a first attempt to quantify the ERPT in the euro area on a purely empirical basis. As a next step, it would be interesting to test particular open-economy DSGE models against the VAR evidence and estimate structural parameters of such a model. For the euro area in the aggregate one could use impulse response matching à la Christiano et al. (2005) to estimate the structural parameters of the model within standard open-economy models. However, for cross-country comparisons within the euro area, the existing two country open economy DSGE models are not suitable. One needs to modify the models to account for the fact that individual member countries take monetary policy as given but share it with all intra-euro area trading partners. That way one could potentially estimate interesting structural parameters such as the degree of openness (i.e. size of the traded goods sector), the degree of price rigidities, etc., which are crucial in theory for the level and dynamics of ERPT for individual EMU member countries.

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Annex

A – Data Sources
Table 2 summarizes the detailed data sources.

Table 2

Data Sources

Variable	Measured by	Unit	Source	Database/Table/Series	Links
Oil prices	Crude oil price	USD/Barrel	IMF	OeNB database based on IMF data	
Industrial production	Industrial production	Index		Industry and services – monthly data (is_m); industrial production – total industry (excluding construction) – seasonally adjusted (is080idx)	http://epp. eurostat. ec.europa.eu/
Exchange rates	Effective exchange rates	Index	Eurostat	Industrial countries' effective exchange rates including the new EU Member States – monthly data (ert_eff_ic_m); nominal effective exchange rate – 41 trading partners (neer41)	http://epp. eurostat. ec.europa.eu/
Import prices					
Germany	Import price index	Index	Federal Statistical Office	Import prices	http://www. destatis.de/
Netherlands	Import price index	Index	Eurostat	Industry – monthly indices of import prices (ebt_inpi_m); import price index (impr); total industry (excluding construction) (c_d_e); gross data (gross)	http://epp. eurostat. ec.europa.eu/
All other countries	Unit values	Index	OeNB	OeNB computations based on Eurostat import values and volumes	
Producer prices	Producer prices	Index	OECD	Price indices (Main Economic Indicators – MEI); manufacturing products	http://www. oecd.org/ statsportal/
Consumer prices	HICP	Index	Eurostat	Harmonized consumer prices – monthly data (cp_m); harmonized consumer prices – monthly data (cp000idx)	http://epp. eurostat. ec.europa.eu/
Interest rates	Day-to-day money market interest rate		Eurostat	Monetary and financial indicators – monthly data (mf_m); day-to-day money market interest rates – monthly average – not seasonally adjusted (mf100rt)	http://epp. eurostat. ec.europa.eu/

Source: Author's compilation.

B – Alternative Estimation Technique

This section illustrates an alternative empirical approach based on Jordà (2008), which yields qualitatively comparable results. Here, I abstract from the assumption that agents use a VAR to form their expectations and instead assume that the expectations in (1) are computed by direct forecasts using local linear projections. In addition, I do not report the conventional two standard error confidence bands around each single impulse response coefficient but, rather, confidence regions based on the joint test of the whole impulse response path against the alternative constant

path at zero (Jordà, 2008). Section B.1 briefly illustrates the estimation and testing strategy, and section B.2 reports the empirical results.

B.1 Estimation and Inference by Local Projections

Following Jordà (2008) I use local projections to compute the $h = 1, ..., H$ structural impulse response coefficients, $\hat{\Phi}_h$, associated with the 7×1 vector time series $y_{i,t}$ and stack them to the impulse response path

$$\hat{\Phi}(1, H) = \begin{bmatrix} \hat{\Phi}_1 \\ \vdots \\ \hat{\Phi}_H \end{bmatrix} \quad (3)$$

where $\hat{\Phi}(1, H)$ is a $7 \cdot H \times 7$ matrix. The estimated impulse response of the ith variable to a shock in the jth variable at horizon h is given by the (i,j) element of the 7×7 matrix $\hat{\Phi}_h$. The accumulated responses reported in charts 7 through 9 in section B.2 are then constructed as

$$\hat{\phi}_{i,j} = LS_{i,j} vec\left(\hat{\Phi}(1, H)\right) \quad (4)$$

where $S_{i,j} \equiv e'_j \otimes (I_H \otimes e_i)'$, with e_ℓ representing the ℓth column of I_7, is a selector matrix that picks the $(i,j)^{th}$ impulse response and L is an $H \times H$ matrix with ones in the main diagonal and below, which sums up the response coefficients. The associated variance covariance matrix is $\hat{\Omega}_{i,j} = LS_{i,j}\hat{\Omega}_\phi S'_{i,j} L'$, where $\hat{\Omega}_\phi$ is a consistent estimator of the variance covariance matrix of

$vec\left(\hat{\Phi}(1, H)\right)$ (see Jordà, 2008 for details of the computation of $\hat{\Omega}_\phi$).

To compute confidence regions for the $(i,j)^{th}$ impulse response function I construct the Wald statistic

$$\hat{W}(i, j) = T \hat{\phi}'_{i,j} \hat{\Omega}^{-1}_{i,j} \hat{\phi}_{i,j} \xrightarrow{d} \chi^2_H \quad (5)$$

which allows me to test the null hypothesis $H_0 : \phi(i, j) = 0_{H \times 1}$. This is nothing else than testing for *joint significance* of the $(i,j)^{th}$ impulse response path. Each figure in the subsequent section reports the value of the Wald statistic, $\hat{W}(i,j)$, and the associated χ^2_H critical values and p-values for a significance level of $\alpha = 0.05$. Following Jordà (2008) I also compute two-dimensional approximations of the 95%, 75%, 50%, and 25% confidence regions and plot them as *fan charts*.

B.2 Empirical Results

Charts 7 through 9 plot accumulated impulse responses for a horizon $H = 6$ (half a year) of $\pi^m_{i,t}$, $\pi^w_{i,t}$, and $\pi^c_{i,t}$, in response to shocks to $\Delta e_{i,t}$ estimated with local projections as outlined in the previous section. Qualitatively, the pictures convey the same information as the pictures in the main text. Notice that the joint Wald tests at a 95% confidence level for import prices suggest that only Germany and the Netherlands experience significant ERPT. Again, that suggests that the unit value measures used for the remaining countries are a poor measure for import prices.

Chart 7

Exchange Rate Shock − Local Projections for Import Prices
(accumulated response of $\pi_{i,t}^m$ to a 1% change in $\Delta e_{i,t}$)

Import Prices − Euro area

change in %

p=0.29393
W=7.3007
c_{95}=12.5916

Months
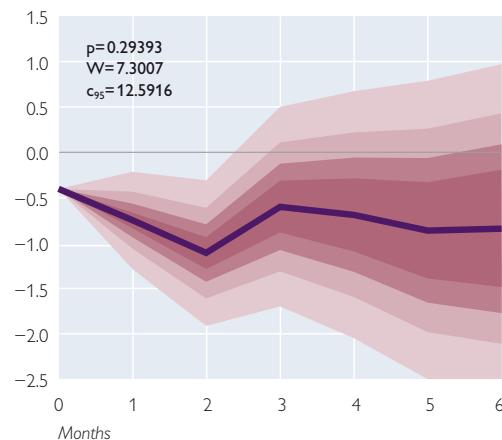
Import Prices − Austria

change in %

p=0.99002
W=0.87156
c_{95}=12.5916

Months

Import Prices − Germany

change in %

p=8.3493e-07
W=38.6586
c_{95}=12.5916

Months
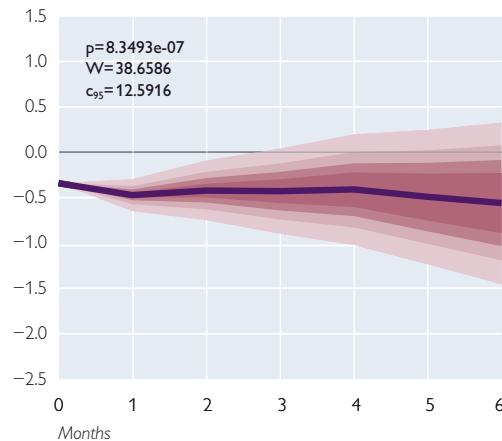
Import Prices − France

change in %

p=0.98758
W=0.94601
c_{95}=12.5916

Months
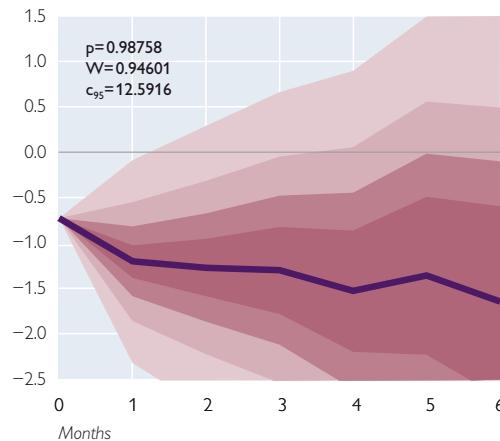
Import Prices − Italy

change in %

p=0.86005
W=2.5744
c_{95}=12.5916

Months
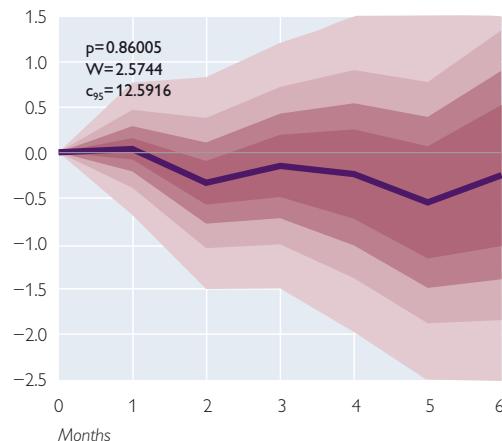
Import Prices − Netherlands
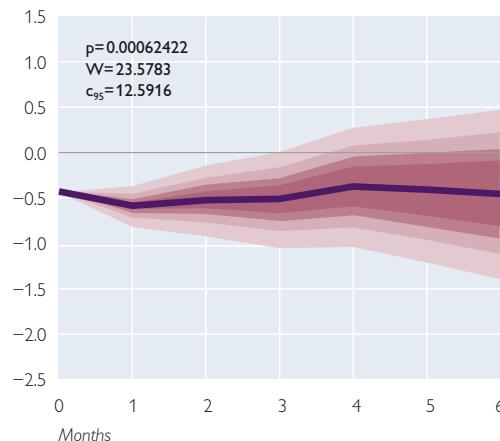
change in %

p=0.00062422
W=23.5783
c_{95}=12.5916

Months

— Impulse response   95% confidence   75% confidence   50% confidence   25% confidence

Source: Author's calculations.

Note: The asymptotic 95%, 75%, 50%, and 25% confidence regions are based on methods developed by Jordà (2008). In each graph the p-values, the Wald statistic, and the critical value for the 95% confidence level are denoted by W, p, and c_{95}, respectively.

Chart 8

Exchange Rate Shock − Local Projections for Producer Prices
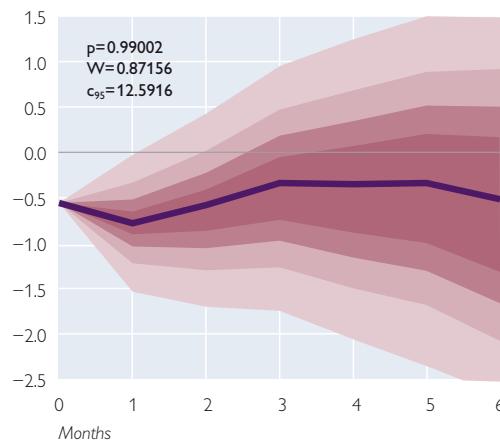## (accumulated response of $\pi_{i,t}^{w}$ to a 1% change in $\Delta e_{i,t}$)

Producer Prices − Euro area

change in %

p=0.011368
W=16.4865
c_{95}=12.5916

Months

Producer Prices − Austria

change in %

p=0.55186
W=4.9374
c_{95}=12.5916

Months

Producer Prices − Germany

change in %

p=0.12981
W=9.8797
c_{95}=12.5916

Months

Producer Prices − France

change in %

p=0.62298
W=4.398
c_{95}=12.5916

Months

Producer Prices − Italy

change in %

p=0.050397
W=12.5699
c_{95}=12.5916

Months
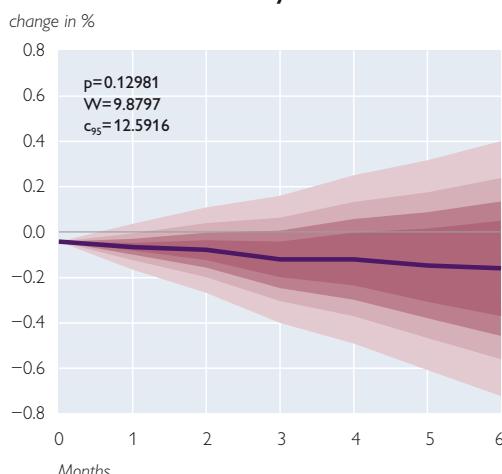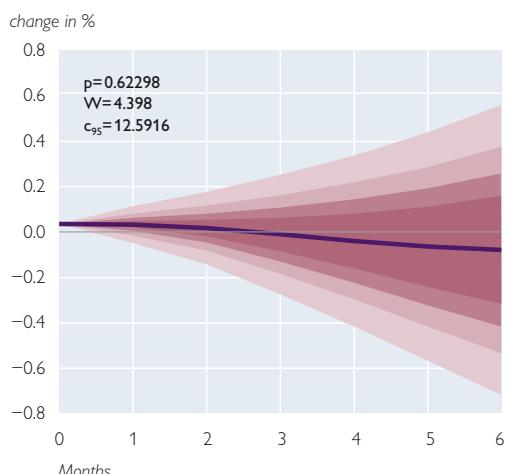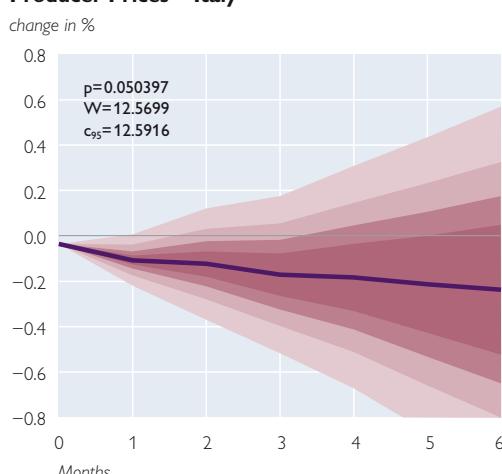
Producer Prices − Netherlands

change in %

p=0.018909
W=15.179
c_{95}=12.5916

Months

Impulse response   95% confidence   75% confidence   50% confidence   25% confidence

Source: Author's calculations.

Note: The asymptotic 95%, 75%, 50%, and 25% confidence regions are based on methods developed by Jordà (2008). In each graph the p-values, the Wald statistic, and the critical value for the 95% confidence level are denoted by W, p, and c_{95}, respectively.

Chart 9

Exchange Rate Shock − Local Projections for Consumer Prices
(accumulated response of $\pi_{i,t}^c$ to a 1% change in $\Delta e_{i,t}$)

Consumer Prices − Euro area

change in %

p=0.19708
W=8.6043
c_{95}=12.5916

Months

Consumer Prices − Austria

change in %

p=0.33032
W=6.8986
c_{95}=12.5916

Months

Consumer Prices − Germany

change in %

p=0.12133
W=10.0798
c_{95}=12.5916

Months
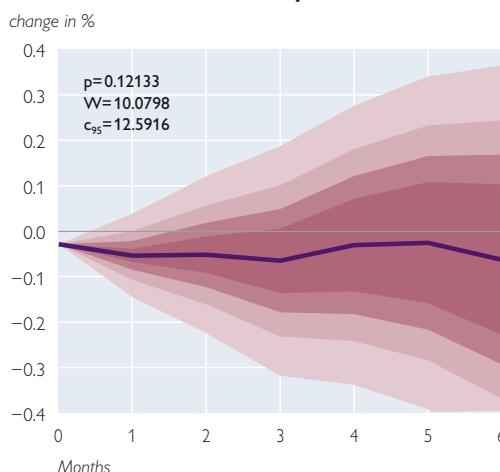
Consumer Prices − France

change in %

p=0.37936
W=6.4052
c_{95}=12.5916

Months

Consumer Prices − Italy

change in %

p=0.31353
W=7.0798
c_{95}=12.5916

Months
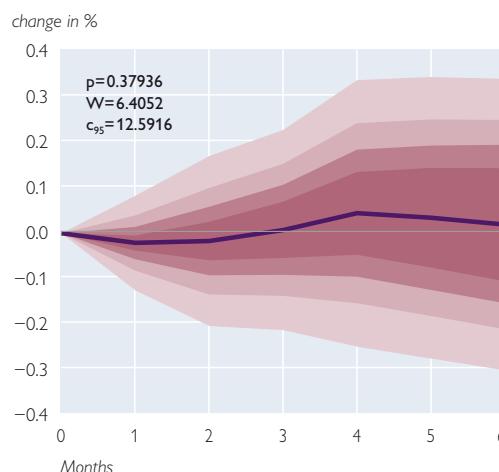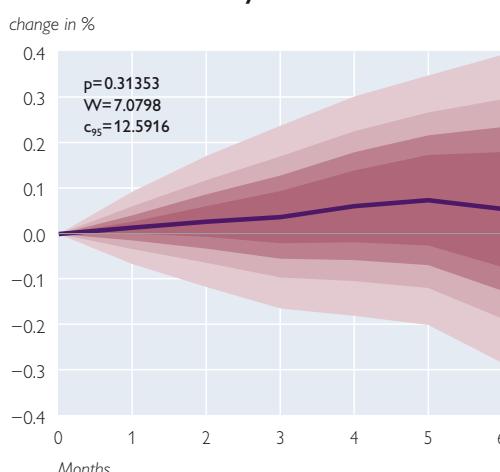
Consumer Prices − Netherlands
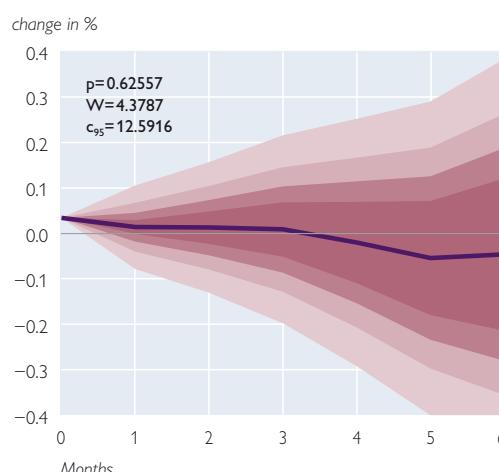
change in %

p=0.62557
W=4.3787
c_{95}=12.5916

Months

—— Impulse response   95% confidence   75% confidence   50% confidence   25% confidence
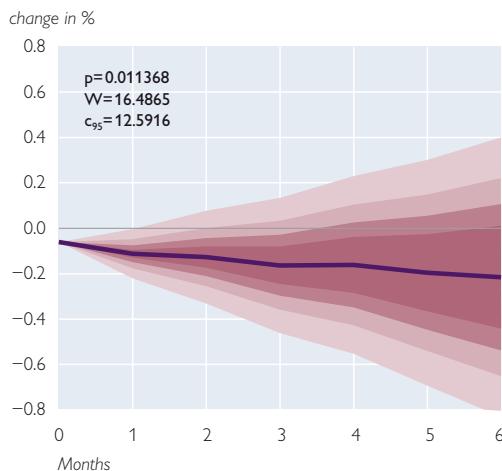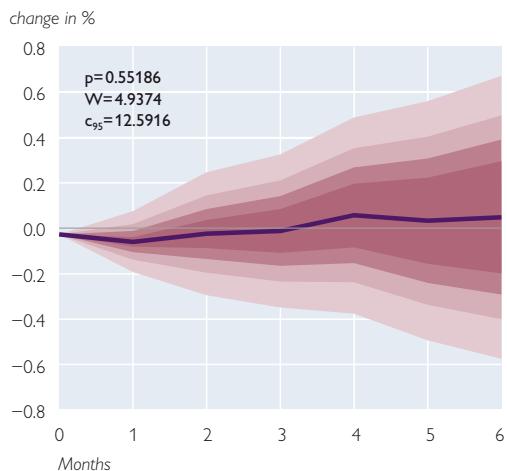
Source: Author's calculations.

Note: The asymptotic 95%, 75%, 50%, and 25% confidence regions are based on methods developed by Jordà (2008). In each graph the p-values, the Wald statistic, and the critical value for the 95% confidence level are denoted by W, p, and c_{95}, respectively.

Housing Wealth of Austrian Households

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Real estate holdings, i.e. housing wealth and estates in land account for the majority of assets owned by Austrian households. At the same time, the associated mortgage loans constitute the bulk of households' liabilities. Therefore, detailed data on real estate holdings and real estate financing are highly relevant both from the monetary policy perspective and with regard to the objective of maintaining financial stability. This is why in September 2008 the G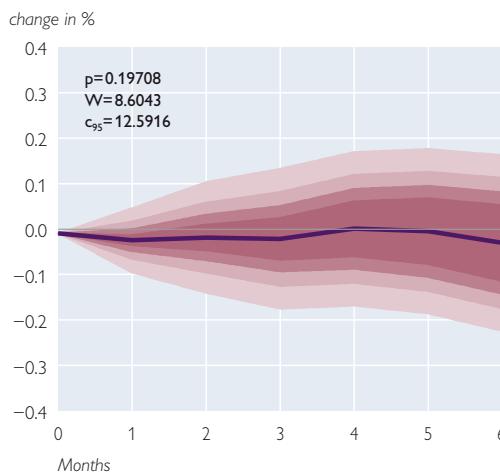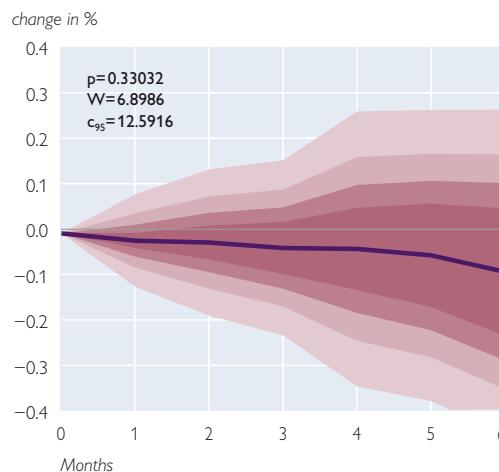overning Council of the ECB decided to initiate a comprehensive project aimed at collecting comparable data on household assets and liabilities across the euro area. All Eurosystem central banks will take part in this project. Many other central banks, including those in the U.S.A., Italy, Spain and Cyprus, have a long tradition of collecting and analyzing such data.

As a first contribution by the Oesterreichische Nationalbank (OeNB) to this Eurosystem project, this study provides the first microdata-based assessment of Austrian households' real estate holdings. In the primary residence category, Austrian households' average housing wealth is estimated at EUR 130,000 (or at EUR 110,000, excluding the top 1% of observations in the real estate wealth distribution of the primary residence), while their average total housing wealth is estimated to come to EUR 250,000 (or EUR 200,000, excluding the top 1% of observations in the total real estate wealth distribution). The total housing wealth of Austrian households is estimated at a minimum of EUR 690 billion.

The major part of Austrian households' assets is made up of real estate holdings, i.e. housing wealth and estates in land. Housing wealth differs from other types of assets. While being part of households' assets, owner-occupied housing is also a consumer good. In many cases, owner-occupied housing is mainly debt-financed. Real estate incurs relatively high transaction costs and is not easily liquidated. Moreover, tax regulations applying to real estate financing have an influence on incentives for acquiring real estate assets and render international comparisons of real estate markets more difficult.

Real estate is often used as collateral for loans. Changes in real estate prices have an impact on household consumption and on the capacities of households to take on credit burdens. A number of papers suggest that wealth effects triggered by real estate price changes affect household consumption more strongly than changes in stock prices (Case et al., 2005).

Liquidity-constrained households are granted access to consumer loans because of their real estate wealth. However, as the current financial and economic crisis has shown, even a small fraction of households with exceeding (mortgage) debt can have a major impact on the entire financial and economic system.

As mortgage debt accounts for a large share in total household debt, the concrete structure of mortgage markets significantly influences the transmission mechanism of monetary policy. Changes of key policy rates lead to changes in mortgage interest rates (via the interest rate channel) and impact households' repayment capacity while at the same time influencing credit supply (credit channel). From the monetary policy perspective, whether monetary policy measures have an effect on

the real estate market or on economic growth not only depends on the concrete structure of the lending market and the availability of alternative means of financing but, to a large extent, on the share of variable rate loans in total loans. The general tendency to neglect conventional lending instruments (mortgage loans) in favor of more strongly market-based types of real estate financing (e.g. securitization) poses new challenges to monetary policy. Regulatory and institutional characteristics of mortgage markets (loan-to-value ratios, banks' valuation methods, etc.) may curb or augment the transmission effect of real estate prices on the availability of loans to households.

There are major differences in the structures of real estate financing in Europe and the U.S.A. While fixed interest rate loans dominate the U.S. market, variable rate mortgage loans prevail in some European countries (e.g. Spain or Germany), with a substantial variation across countries, ranging from 10% to 99% of total loans (ECB, 2009a). Different refinancing practices on the part of banks as well as institutional differences (e.g. the amount of exit fees due in case of early repayment) and cultural factors appear to be the reason why variable rate loans are not equally popular across countries. Fiscal factors also play an important role in households' real estate financing decisions (e.g. tax deductibility of mortgage rate payments).

In Austria, mortgage loans denominated in foreign currency (mainly in Swiss francs) are very common. These loans entail substantial risks,[2] as has become evident during the financial crisis.

Although real estate holdings play a major role in Austria, so far there have been only a few data sources and studies that estimate real estate wealth (Hahn and Magerl, 2006; Eizinger et al., 2004). And none of these studies had access to disaggregated household data.

Section 1 sums up essential aspects in the relationship between monetary policy and housing wealth. Section 2 presents the OeNB Household Survey on Housing Wealth 2008 (HSHW). Section 3 presents various estimates derived from this household survey, with section 3.1 dealing with estimates of homeownership rates and section 3.2 with valuation issues. Section 3.3 provides estimates concerning the average value of real estate holdings per household and estimates of the aggregate housing wealth of all households. Finally, section 4 focuses on one of the most important transmission channels of monetary policy – i.e. via housing wealth – and contains key figures on households' mortgage debt. Section 5 points to follow-up studies dealing in more detail with methodological issues and specific aspects of housing wealth.

1 Housing Wealth and Monetary Policy

To improve their economic analyses of monetary policy and financial stability, central banks make increasing use of microdata on the assets, liabilities and expenditure of households. The first central banks to conduct related surveys at the national level were Italy (in the early 1960s) and the U.S.A. (as of 1983). Nowadays, many central banks carry out such surveys, mostly at regular intervals, e.g. those of Australia, Cyprus, Greece, the Netherlands,

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[2] This is particularly true for foreign currency loans linked to fixed-maturity repayment vehicles and means that such loans are riskier than others since they are not only subject to exchange rate risk, but the yield curve of the underlying repayment vehicles is unpredictable and additional valuation risks may exist.

Portugal and Spain. In September 2008, the Governing Council of the ECB decided that in the future all central banks in the euro area would conduct such household surveys (ECB, 2009b). This measure aims at substantially improving the basis for analyzing monetary policy and financial stability-related issues within the Eurosystem.

The current financial crisis clearly illustrates the significance of such data: It is the varying degree of indebtedness across different income, professional and age groups rather than the amount of household debt across the entire house-

hold sector which indicates potential risks for financial stability and the transmission of monetary policy stimuli. Central banks' fundamental objective of ensuring financial stability would be difficult to attain without economic analyses on the basis of microdata. However, quantitatively realistic models of households' spending behavior are also of crucial importance for monetary policy and continue to gain significance in a globalized environment. Housing wealth plays a particularly important role in the transmission of monetary policy (box 1).

Box 1

Transmission of Monetary Policy via Housing Wealth[1]

A Direct Transmission Channels

A.1 Cost of Capital

If short-term interest rates are raised following a monetary policy decision, long-term interest rates tend to increase as they are tied to the expected future short-term rates. This drives up the cost of borrowing capital, which in turn reduces demand for real estate. The greater the share of variable rate loans in total loans, the stronger this effect will be.

A.2 Expected Future Changes in Real Estate Prices

When interest rates are raised, demand for real estate goes down and so do real estate prices. However, if an interest rate increase additionally reinforces expectations of a further tightening of monetary policy, this slows down the expected rise of real estate prices, which results in higher current costs of capital and, consequently, a further decline in the supply of and demand for real estate. This is only the case if the expectations of a future price increase are influenced by monetary policy. Otherwise, if expectations of a future increase of real estate prices remain unchanged, a drop in current real estate prices will have a positive effect on demand.

A.3 Real Estate Supply

As real estate is developed relatively quickly, short-term interest rates are relevant for the supply side as well. Higher interest rates increase the cost of real estate development, which in turn curbs building activities.

B Indirect Transmission Channels

B.1 Effects of Real Estate Price Changes

The life-cycle theory implies that every unexpected change in asset prices impacts consumption. This also applies to real estate assets, which are distributed more evenly across the household population than more volatile forms of assets (e.g. stock holdings). Changes in real estate prices therefore do not only concern wealthy households, which have a lower marginal propensity to consume than households with smaller assets. Many studies suggest that real estate price changes impact consumption more strongly than stock price changes (ECB, 2004; Catte et al., 2004).

[1] *See Mishkin (2007).*

B.2 Credit Channel and Balance Sheet Effect on Consumption

An increase in real estate prices may indirectly boost consumption if loans become more easily accessible for households. This applies not only to households whose access to credit was previously restricted. Many households hold assets while at the same time being subject to considerable liabilities (Fessler and Mooslechner, 2008). Generally, information on asset-backed collateralization is important for lenders, which plays a significant role particularly in markets where access to information is asymmetrical. Borrowing and lending can thus be modeled as strategic interaction.

Studies on the U.S.A. have examined the effects of housing wealth on consumption (for an overview, see e.g. Altissimo et al., 2005). The findings imply that a change in housing wealth by USD 1 results in changes in consumption patterns of between USD 0.02 and USD 0.09. Case et al. (2005) provide evidence that a 10% increase in housing wealth boosts consumption by approximately 1.1%, while a 10% increase in stock holdings hardly impacts consumption at all. Carroll et al. (2006) also differentiate between short-term and long-term effects of housing wealth on consumption. With regard to financial wealth, Catte et al. (2004) estimate the long-run propensity to consume out of financial wealth to be between 0.01 in Italy and 0.07 in Japan. The OECD average is 0.035 and the U.S. average is 0.03.

B.3 Credit Channel and Balance Sheet Effect on Real Estate Demand

From a neoclassical perspective, it does not make a difference whether a household opts for a fixed rate or a variable rate loan, since the average interest rate over the duration of real estate ownership is the relevant parameter also for variable rate loans. If households have restricted credit access or their borrowing behavior is based on nothing more than rules of thumb, however, short-term interest rates and the chosen type of financing (fixed rate or variable rate loans) have an impact on real estate demand. The higher the short-term interest rates and the greater the share of variable rate loans in total loans, the lower demand will be. Especially for households with restricted credit access, the cash flow, i.e. the difference between current income and expenditure, is an important factor in financing. If financing costs for variable rate loans increase due to a rise in short-term interest rates, the households affected will have higher expenses. Higher nominal interest rates impact the cash flow, which in turn reduces demand for real estate since a lower cash flow also restricts the amount of credit these households can afford to take on or will be granted.

For Austria, these effects are of specific relevance because on the one hand, Austria posts a considerably high percentage of variable rate loans by international standards and on the other hand a number of risks accumulate due to the relatively large share of foreign currency loans in total loans in Austria.

2 OeNB Household Survey on Housing Wealth 2008

This study is based on empirical data collected during the OeNB Household Survey on Housing Wealth 2008 (HSHW 2008), which was conducted as a pilot project for the planned comprehensive Eurosystem household survey.[3] It is a representative household survey investigating the housing wealth of Austrian households. The respondents were either the owners or tenants[4] of the respective household's real estate at the time of the interview. The survey focused on the ownership of the respective house/apartment and of additional real estate belonging to any of the household members as well as on

[3] *The HSHW 2008 fieldwork was conducted by the Institute for Empirical Social Studies (IFES).*

[4] *The person identified as tenant in the applicable rental agreement.*

the related liabilities owned by the household.[5] Furthermore, detailed socio-economic characteristics and data concerning intergenerational transfers in connection with housing wealth were compiled. The questionnaire contained a total of 168 questions, 28 of which were related to socio-economic characteristics (additionally, 8 questions had to be answered personally by the interviewers themselves).

The survey was carried out using a computer-assisted personal interviewing (CAPI) method, which allows for

immediate plausibility checks during the course of the interview, thus making it possible to correct for inconsistencies right away. The survey was conducted in January, February and March 2008 with fieldwork taking approximately nine weeks. Comprehensive follow-up research was carried out until September 2008.

2.1 Sample

The selection process and criteria for choosing individual units of the target population that are to be included in

Table 1

HSHW 2008 Coverage

	Addresses drawn	Neutral non-responses (wrong address, etc.)	Adjusted sample	Not present at time of interview	Refused to take part in survey	Eliminated interviews (high rate of non-response, editing)	Successful interviews	Coverage rate
	Number							%
Vienna	938	35	903	133	309	10	451	49.9
Lower Austria	576	11	565	59	79	6	420	74.3
Burgenland	108	9	99	19	9	1	72	72.7
Styria	432	5	427	61	67	2	295	69.1
Carinthia	204	3	201	32	27	1	140	69.7
Upper Austria	504	33	471	59	75	12	326	69.2
Salzburg	192	7	185	28	21	2	134	72.4
Tyrol	252	24	228	27	32	6	164	71.9
Vorarlberg	132	14	118	15	17	7	79	67.0
HSHW 2008, total	**3,338**	**141**	**3,197**	**433**	**636[6]**	**47**	**2.081**	**65.1**
The Spanish Survey of Household Finances (EFF) 2005[1]	15,662	1,275	14,387	1,602	6,634	189	5,962	41.4
Survey of Consumer Finances (SCF) Area probability sample 2004[2]	×	×	×	×	×	×	3,007	68.7
Survey of Consumer Finances (SCF) List sample 2004[2]	×	×	×	×	×	×	1,515	34.7
Socio-Economic Panel (SOEP) 2006[3]	3,931	181	3,750	485	1,659[6]	100	1,506	40.2
Household Wealth Survey (HWS) 2004[4]	×	×	5,228	×	×	×	3,455	66.1
Survey on Household Income and Wealth (SHIW) 1998[5]	17,668	1,425	16,243	2,727	6,369	×	7,147	44.0

Source: HSHW 2008, EFF (2005), SCF (2004), SOEP (2006), HWS (2004), SHIW (1998).

[1] *Bover (2008, p. 26).*
[2] *Kennickell (2005, p. 4) and Bucks et al. (2009, p. 54).*
[3] *Von Rosenbladt et al. (2007, p. 15f); first survey, sample „H".*
[4] *Niemeläinen et al. (2006, p. 26).*
[5] *D'Allesio and Faiella (2002, p. 20).*
[6] *Refused to take part in survey or could not participate due to health problems or language barriers (SOEP: 172 of 1,487 addresses).*

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[5] *The survey also included real estate holdings abroad. Private foundations were not included in the survey, but the probability that one of the households in the sample owns a private foundation is very low since rich households tend to be underrepresented in surveys of this type.*

the sample in order to attain a representative sample of the target population are laid down in the sample design (Fessler et al., 2009). Additionally, it may be important to ensure representativeness at sublevels or include a disproportionately large number of respondents from specific population groups in order to obtain more precise estimators (oversampling).[6] The HSHW 2008 uses a stratified multistage cluster address random sample.[7]

2.2 Response Rates – Unit Nonresponse

Unit nonresponse occurs when a selected household refuses or is unable to participate in the survey. From a total of 3,338 addresses drawn, 2,081 turned out evaluable CAPI interviews in the end, corresponding to a response rate of 65.1%. By comparison, the coverage rate reached in the Fed's Survey of Consumer Finances (SCF) in 2004 was 68.7%, while it was 41.4% in Banco de España's Survey of Household Finances (EFF) in 2005 and 40.2% in the Socio-Economic Panel of the German Institute of Economic Research in 2006 (table 1). It must be kept in mind, however, that these surveys cover both households' housing wealth and financial wealth (if respondents receive advance information on all topics of the survey, lower response rates have to be expected for surveys that include questions on both financial and housing wealth than for surveys that include questions on housing wealth only). Table 1 presents the nonresponses categorized by reasons for nonresponse. Nonresponse rates were comparatively high in Vienna, which is in line with experience gained in other surveys in urban areas.

Households were weighted ex post in order to align the sample with certain characteristics of the general population. Households were weighted according to their province of residence, the size of the respective municipality and of the individual household.

2.3 Item Nonresponse – Imputations

Besides the problem of unit nonresponse, i.e. the nonresponse of an entire household selected (drawn), item nonresponse issues may also occur in such surveys. Item nonresponse refers to a situation where respondents either refuse to respond to individual questions or cannot answer them. This would not pose a problem if data omissions were distributed randomly over households. But this cannot be assumed. Evidence for the fact that wealthy or high-income households tend to refuse responses more often, especially if questions concern wealth and income, can be found in the literature (Kennickell, 1998; Albacete et al., 2009). Without taking this fact into account, the estimates for the related variables will be biased. To correct for such omissions, research has come to rely on imputation methods.

Table 2 illustrates the item nonresponse rates for several important variables where data omissions occurred. The HSHW 2008 item nonresponse rate for these questions is average by international standards. The question on household income, for example, had a response rate of 67%, while 23% of Austrian households were willing to assign their household income to a certain bracket. The German Socio-Economic Panel achieved a response rate of 78% for the household income question

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[6] Oversampling was not applied in the HSHW 2008.

[7] See Wagner and Zottel (2009) for further details.

in 2000 (Frick and Grabka, 2003), the Fed's SCF obtained 69% in 1995 (Kennickell, 1998) and Banco de España's EFF reached 48% in 2002 (Bover, 2004). The response rate for classifying income according to brackets was 23% for the HSHW 2008 and 18% for the SCF in 1995.[8]

If missing data are not imputed, estimates will be biased because these data would be left out in the estimation process. This method is referred to as "listwise deletion" in the literature (Little and Rubin, 2002). The missing data are often associated with specific household characteristics, especially with variables such as high income, high educational level or expensive residential area that correlate positively with a high wealth. Imputation corrects for these distortions at least partially. Certain statistical imputation methods (multiple imputation) additionally take into account that imputed data do not exactly correspond to the real values but are subject to a certain degree of uncertainty. For the HSHW 2008, a multiple imputation method was used (Albacete et al., 2009).

3 Real Estate Ownership and Housing Wealth

How many households own real estate? This question generally refers to *ownership of the primary residence*. The primary residence is defined as the place of residence where the respondent mainly lives at the time of the survey, i.e. the responding owners/main tenants need not have registered this residence as their primary residence. The question addresses ownership of the house/apartment in which the interviewed household member lives. Any other pieces of real estate assignable to the same household are subsumed as *other real estate*. Other real estate (e.g. houses, apartments, hotels, office spaces, plots of land, etc.) is assigned to the household if one household member is the (partial) owner of the real estate.

3.1 Real Estate Ownership

According to the HSHW 2008, some 50% of Austrian households own their primary residence. This rate is below the ownership rate of around 57% extrapolated by Statistics Austria, which may be attributed either to the preci-

Table 2

Selected Item-Nonresponse Rates for the HSHW 2008

	Have items[1]	Rate of households surveyed that indicated a specific amount	Rate of households surveyed that indicated a specific bracket	Rate of households that opted for "don't know"	Rate of households that refused to answer
	%				
Net household income	100.0	67.3	22.6	0.4	9.6
Estimated selling price of property	52.1	73.4	14.8	7.3	4.4
Estimated purchase price of property	39.8	65.7	20.9	8.1	5.3
Amount of loan (first loan taken out)	29.6	84.4	6.9	4.0	4.7
Estimated value of inherited property	20.1	61.5	0.0	6.9	31.6

Source: HSHW 2008.

[1] *In line with Kennickell (1998), "have items" designates the rate of households to which the question applies.*

[8] *Some of the quoted survey waves are not very recent. They were nevertheless used in comparing coverage rates for the household income question as more recent data are not available.*

sion of the two estimators or to incongruent definitions of "primary residence." For example, a student living in her own household – a rented apartment – in Vienna would be considered the tenant of a primary residence in the HSHW 2008 even if the apartment was only officially registered as her secondary residence. The definition of "primary residence" chosen for the HSHW 2008 relates more closely to the actual (living) situation and is more in line with what is identified in such surveys as being a "household."

Ownership rates (of the primary residence) differ widely between Vienna and the rest of Austria. In Vienna, around 19% of respondents said they owned their primary residence while the ownership rate is significantly higher at about 59% in the rest of Austria. Chart 1 shows the estimators for the ownership rate in different age categories for Austria as a whole. The age given is the age of the responding (main) owner or tenant of the household surveyed. Ownership of the pri-

mary residence starts to be of particular relevance for the age groups of 30 to 39 years and above. The ownership rate increases significantly again in the age group of 40 to 49 years and then declines slightly for age 70 or older.

With regard to household size, the ownership rate for Austria as a whole (chart 2) rises significantly with the number of persons living in the same household. It is worth noting that ownership rates climb most significantly at the transition from one-person households to two-person households, namely from some 35% to 54% (which is above the Austrian average). The highest ownership rate, at about 67%, is recorded for the largest households (five or more persons).

Blue-collar and white-collar workers are significantly less likely to own their primary residence than self-employed persons, entrepreneurs and civil servants (chart 3), while farmers record an above-average ownership rate. The estimators for farmers and for other

Chart 1

Ownership Rates for Primary Residences according to Owners' Age

● Ownership rates and corresponding 95% confidence intervals
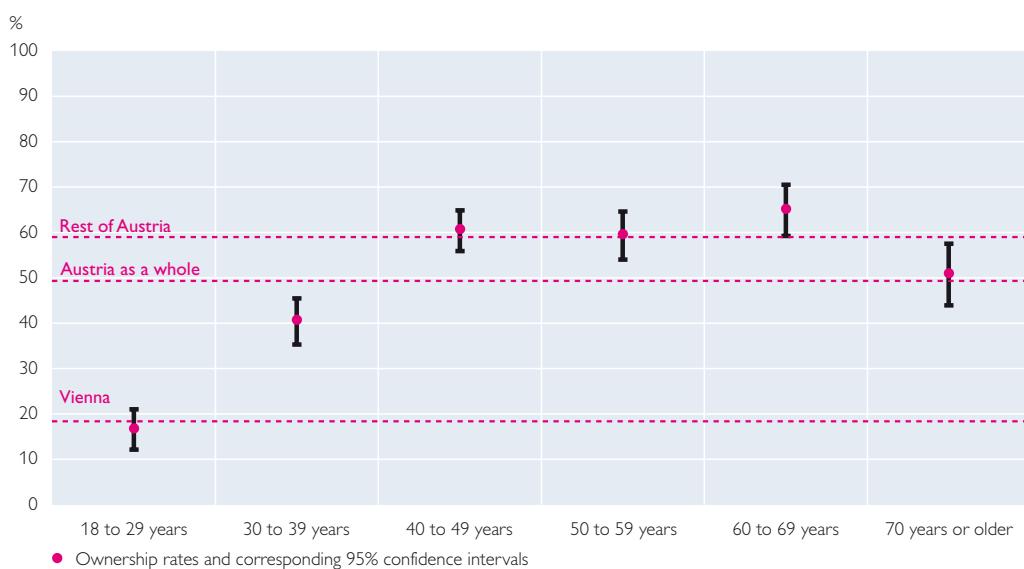
Source: HSHW 2008.

Chart 2

Ownership Rates for Primary Residences according to Number of Household Members

● Ownership rates and corresponding 95% confidence intervals
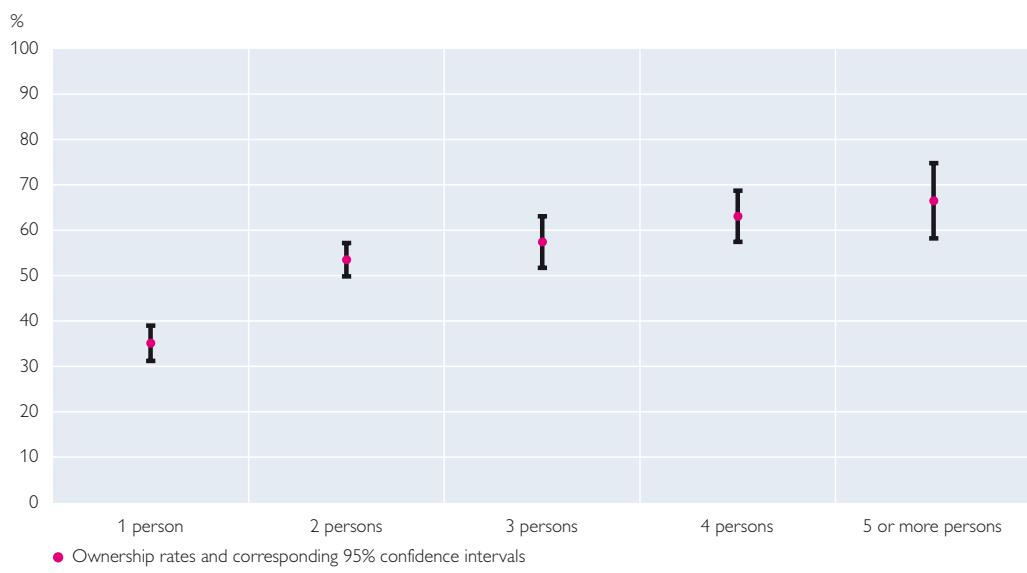
Source: HSHW 2008.

Chart 3

Ownership Rates for Primary Residences according to Occupation

● Ownership rates and corresponding 95% confidence intervals
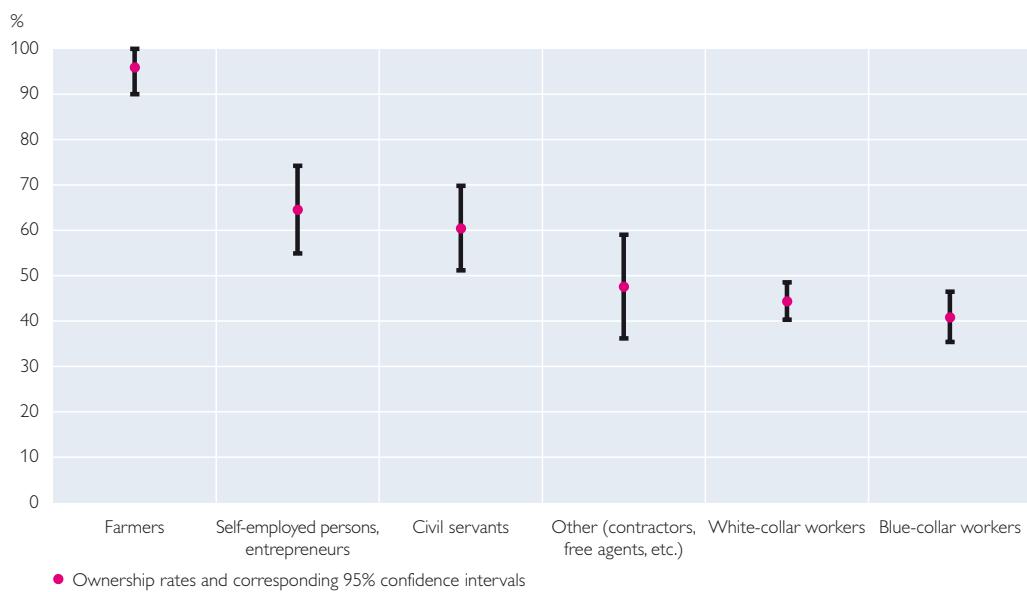
Source: HSHW 2008.

Note: The upper limit of the confidence interval for farmers was corrected downward to the highest possible value.

Chart 4

Vienna versus Rest of Austria: Ownership Rates for Primary Residences according to Net Household Income

%

| | 1st quartile | 2nd quartile | 3rd quartile | 4th quartile |

Legend: Vienna, Rest of Austria
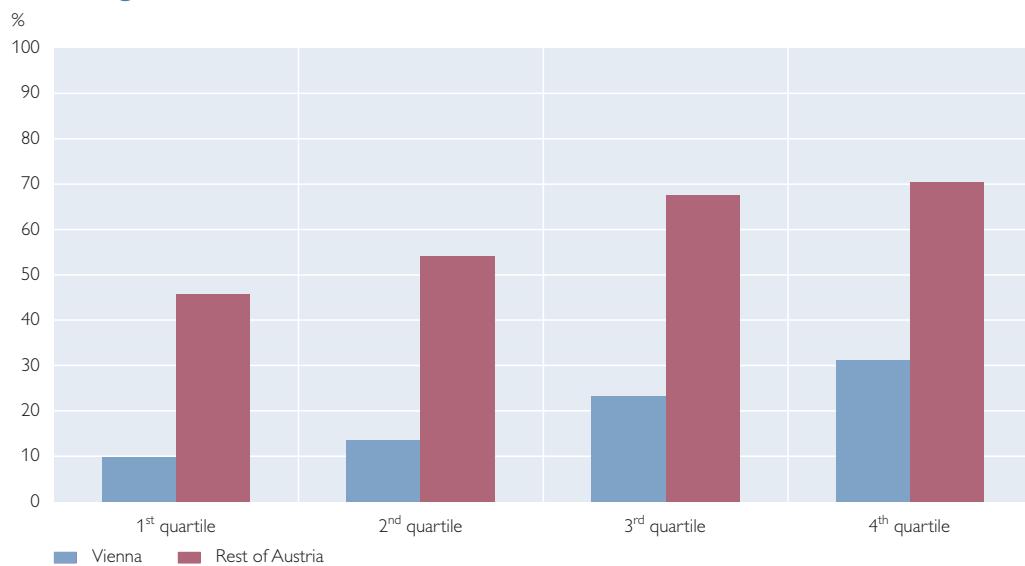
Source: HSHW 2008.

occupational groups (contractors, free agents, etc.) are based on a small sample size (each n <60), however; so that these estimates have to be interpreted with caution.

Chart 4 illustrates the ownership rate for Vienna as compared to that for the rest of Austria, broken down by net household income. Both in Vienna and in the rest of Austria, the ownership rate increases with household income. However, this correlation is significantly stronger in Vienna, where the ownership rate triples between the first and the fourth income quartile.

3.2 Assessment of Housing Wealth

The assessment of housing wealth poses a special challenge in data analysis. In principle, there are several ways of dealing with these conceptual difficulties.

In the HSHW 2008, respondents are asked to provide the purchase price of the real estate, the construction costs or, if applicable, the costs of conversion after purchasing/building the property. Additionally, the respondents

are asked to specify when they purchased the property. On the basis of price development information, these data can then be extrapolated for 2008. This method has obvious weaknesses, since real estate prices develop differently in different regions, while the equivalent value in terms of purchasing power can only be computed on the basis of the Austria-wide consumer price index (CPI). Moreover, this extrapolation is based on the assumption that real estate prices have developed in line with consumer prices.

Information provided by respondents about their property's living space in square meters and the type of property (house, owner-occupied apartment, building located on property owned by others), the interviewer's assessment of the property's quality (basic, medium, good or very good housing quality) and its location (ZIP code) allow for a comparison with current selling prices on the basis of the real estate price report of the Austrian Federal Economic Chamber *(WKÖ Immobilienpreisspiegel)*.

The respondents were also requested to give an estimate of the currently achievable selling price of their property. It is easier to assess the validity of data through a comparison of the various available estimates. In comparable international surveys, the selling price estimate provided by the owner of the respective property is considered the most reliable source for the actual value of the property (Bucks and Pence, 2006; Cannari and Faiella, 2008; Cannari et al., 2008). Whether the owner actually is the most reliable source for estimating the property's currently achievable selling price may, however, depend on the availability of disaggregated statistics on current selling prices and/or on whether residential areas can easily be differentiated by residents' social status and household wealth, as all this information is essential for the validity of any other estimates.

By way of a plausibility check, owners' estimates were compared to data provided by the *WKÖ Immobilienpreisspiegel,* which indicates current selling prices (per square meter) of real estate (used owner-occupied apartments, detached and terraced houses, building plots, etc.) across all Austrian districts, broken down by housing quality (basic, medium, good, very good).

A comparison of the various estimates reveals that distributions are rather congruent, particularly with respect to their spread. Specifically, the mean value and the median calculated from the value of primary residences as estimated by owners are EUR 260,000 and EUR 200,000 respectively, and the corresponding values extrapolated from data given in the *WKÖ Immobilienpreisspiegel* are EUR 180,000 and EUR 150,000. Differences may be attributable, for example, to interviewers underestimating the housing quality category or owners overestimating the value of their real estate. Moreover, the *WKÖ Immobilienpreisspiegel* only contains a small number of observations for some districts. Premium-value real estate is not represented at all using the calculations based on the *WKÖ Immobilienpreisspiegel.* For example, the highest purchase price quoted by an owner in the HSHW 2008 is twice the maximum value calculated on the basis of the *WKÖ Immobilienpreisspiegel.*

3.3 Value of Housing Wealth

3.3.1 Value of Primary Residence

In the primary residence category, the average value of household real estate wealth in Austria is approximately EUR 130,000 (table 3). The corre-

Box 2

Information on the Disclosed Data

All values given in this study are rounded to the next 10,000 to account for slight changes in data records that might be caused by a further refinement of the multiple imputation method in the coming months. Real estate wealth distribution is strongly skewed to the right, indicating that real estate wealth is distributed very unequally. A few observations can, therefore, substantially impact the mean values, so that two values are given in each case: one value that takes all data into account and one that excludes the uppermost percentile (top 1%) of all observations from the calculation. This calculation is based on the assumption that the mean value of the excluded top percentile equals the mean value of the remaining 99%. This type of representation was chosen in order to make as transparent as possible how robust the estimators are in relation to the skewness of the distribution. All represented values are gross values.[1]

[1] *Netting off loans taken out for housing financing is not useful since the survey did not capture all wealth components and real estate may also be used as collateral for consumer loans.*

sponding value of housing wealth based on the data excluding the top 1% of observations in the real estate wealth distribution of the primary residence is EUR 110,000. As all tenants are assigned a value of zero in this calculation, the median for the two variables is zero. If the calculation includes only the households that actually own their primary residence, the respective values are EUR 260,000 and EUR 230,000.

If only the group of households owning their primary residence is considered (table 4), housing wealth is again unequally distributed across regions. The respective difference between mean value and median for Vienna is above that for the rest of Austria, both for all observations and for observations excluding the top 1%.

Data on real estate owners' educational level (table 5) reveal that the primary residences particularly of owners that have completed tertiary education have a significantly higher value. While

younger owners tend to have a higher level of education, the level of wealth correlates positively with age. These divergent effects dampen wealth differences across educational levels.

Breaking down the value of owner-occupied real estate by the educational level of the owners' fathers, it becomes evident that the above mentioned inequalities persist over time. The value of owner-occupied real estate belonging to owners whose fathers have completed tertiary education is significantly higher. In fact, given the age effect, obviously the value of property owned by respondents whose highest level of education is compulsory education is also relatively high.

3.3.2 Value of All Properties – Primary Residence and Other Properties

The average Austrian household has real estate holdings worth EUR 250,000 (all observations) or EUR 200,000 (excluding top 1% in the total real estate

Table 3

Estimated Selling Price of Primary Residence

	All observations		Excluding top 1%	
	Mean value	Median	Mean value	Median
	EUR			
All households	130,000	0	110,000	0
Owner households only	260,000	200,000	230,000	200,000

Source: HSHW 2008.

Table 4

Estimated Selling Price of Home Owners' Primary Residences

	All observations		Excluding top 1%	
	Mean value	Median	Mean value	Median
	EUR			
Rest of Austria	260,000	200,000	230,000	200,000
Vienna	260,000	190,000	230,000	180,000

Source: HSHW 2008.

Table 5

**Estimated Selling Price of Home Owners' Primary Residences −
Breakdown by Level of Education**

		All observations		Excluding top 1%	
		Mean value	Median	Mean value	Median
		EUR			
Owner's highest level of education	Compulsory education	220,000	170,000	200,000	170,000
	Apprenticeship, vocational school, intermediate or higher technical/vocational school	260,000	200,000	230,000	200,000
	High school (Matura)	260,000	200,000	220,000	190,000
	College, university, academy	300,000	230,000	250,000	220,000
Owner's father's highest level of education	Compulsory education	250,000	190,000	220,000	190,000
	Apprenticeship, vocational school, intermediate or higher technical/vocational school	260,000	200,000	230,000	200,000
	High school (Matura)	230,000	180,000	230,000	180,000
	College, university, academy	400,000	250,000	260,000	220,000

Source: HSHW 2008.

wealth distribution), respectively. If only the households that own their primary residence and/or other real estate are taken into consideration, average real estate wealth amounts to EUR 420,000 and EUR 330,000, respectively. The EUR 90,000 difference between the two mean values (table 6) clearly shows to what extent the top percentile of the distribution influences such calculations. The distribution of the value of all real estate, i.e. the value of primary residences plus any other real estate held, is even more unequally distributed than that of the value of primary residences alone.

A comparative analysis of households owning their primary residence or other real estate in Vienna and in the rest of Austria renders a picture similar to that of the analysis of primary residence ownership. Higher mean values and lower medians for Vienna point to more pronounced differences in Vienna which are not only attributable to the significantly lower ownership rate found there. Still, it should be noted that the estimator for Vienna is less precise than that for the rest of Austria as the number of observations for Vienna is smaller.

Table 6

**Estimated Selling Price of Total Real Estate Holdings
(Primary Residence and Other Real Estate)**

	All observations		Excluding top 1%	
	Mean value	Median	Mean value	Median
	EUR			
All households	250,000	100,000	200,000	90,000
Owner households only	420,000	220,000	330,000	210,000

Source: HSHW 2008.

Table 7

Estimated Selling Price of Owner Households Total Real Estate Holdings (Primary Residence and Other)

	All observations		Excluding top 1%	
	Mean value	Median	Mean value	Median
	EUR			
Rest of Austria	400,000	220,000	330,000	220,000
Vienna	500,000	200,000	360,000	200,000

Source: HSHW 2008.

3.3.3 Total Value of Real Estate

Microdata surveys do not primarily aim at estimating aggregates. Rather, such surveys seek to derive economic relationships from abundant data on households. Unfortunately, in Austria – as in many other countries – hardly any conclusive macroeconomic data are available on households' housing wealth.

Hahn and Magerl (2006) estimate the market value of total real estate holdings in Austria at EUR 692 billion, with households accounting for EUR 387 billion (estates in land worth EUR 133 billion, residential buildings worth EUR 254 billion), businesses for EUR 231 billion (estates in land worth EUR 33 billion, commercial buildings worth EUR 198 billion) and agricultural or forestry real estate coming to EUR 74 billion (estates in land worth EUR 34 billion, buildings worth EUR 40 billion). In the methodology used by Hahn and Magerl, the price indices published by Statistics Austria served to derive estimates based on the capital stock model of the Austrian Institute of Economic Research (WIFO), while estimates regarding estates in land were mainly based on price indicators. Eizinger et al. (2004) estimate the value of owner-occupied housing in Austria at EUR 428 billion (2002).

The HSHW 2008 also allows for projections for the total approximate real estate wealth of Austrian households. To this end, weighted household values are scaled upward in such a way as to reflect the total number of households in Austria in 2007 (most recently available value). According to this calculation, the total real estate wealth of Austrian households comes to a minimum of approximately EUR 690 billion. This calculation is based on the assumption that the mean value of the excluded top percentile equals the mean value of the remaining 99%. If the maximum value for the data set excluding the top 1% is used instead of the top percentile values, the total value would come to some EUR 790 billion. If all data, including the so-called outliers, are taken into account, the resulting value is approximately EUR 880 billion.

A value range from EUR 690 billion to EUR 880 billion for Austrian households' total real estate wealth, as derived from the above calculations, appears to be relatively plausible. International findings based on microdata surveys (Sierminska et al., 2006) record a share of housing wealth in households' total assets of some 60% (U.S.A., U.K.) to 80% (Italy, Germany, Sweden). The ECB estimates the share of real estate wealth in households' total assets for 2007 to come to about 60% (ECB, 2008). According to financial accounts data, the financial assets of Austrian households (including self-employed persons) were

EUR 416 billion in the fourth quarter of 2007.[9] In line with this figure, the share of housing wealth in Austrian households' total assets would range from 62% to 68%. The plausibility of these figures is further supported by the fact that microdata surveys often underestimate financial assets in particular. Therefore, international findings derived from microdata surveys tend to indicate the upper limit for the share of real estate wealth in total assets.

4 Housing Finance

Debt resulting from real estate financing accounts for the largest share of total household debt. In turn, real estate is the most popular collateral for household debt.

In the HSHW 2008, households were asked whether they took out a loan to acquire or build their home; moreover, they had to give the number of loans taken out and provide additional details about the loans (type of loan, total loan amount, collateralization, residual debt outstanding, interest

rate, duration, underlying repayment vehicles).

According to the HSHW 2008, 33% of all home owners reported mortgage debt outstanding from real estate financing (result covers primary residences only).[10] In the two lower age groups (18 to 29 years and 30 to 39 years), 51.6% and 64% of home owners, respectively, had taken out mortgage loans for the purchase of their home. Ownership rates for these two age groups are lower (16.5% and 40.4%, respectively). Households belonging to the two lowest income quartiles also exhibit below-average ownership rates. The share of home owners with outstanding loans is even lower for the two lowest income quartiles; in the higher quartiles, this share increases to some 40%.[11] 29% of the indebted households have taken out at least one foreign currency loan.

According to ECB monetary statistics, 27.5% (in terms of total amount) of households' outstanding loans in the fourth quarter of 2007[12] were issued in

Table 8

Share of Households with Outstanding Loans of at Least One of the Quoted Types[1]

Type of loan	Vienna	Rest of Austria	Total
	% of households		
Foreign currency loan	26.2	28.8	28.5
Euro-denominated loan	79.0	74.9	75.3
Other loans (from family, friends, etc.)	6.4	6.0	6.0

Source: HSHW 2008.

[1] Share in total number of households with outstanding loans.

Note: Figures may not add up to 100% because households may have more than one loan outstanding. The "Other loans" option is of small sample size (n<50).

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[9] This value includes investments in businesses not publicly traded to the amount of EUR 31.6 billion. Equity investment may partly include estates in land abroad, which are recorded as equity investment in the financial account (worth around EUR 3 billion).

[10] For further details on housing finance of households, refer to Albacete and Wagner (2009).

[11] Sample sizes are small (n<50) for both the lowest age group and the lowest income quartile.

[12] I.e. at the time when data on loans outstanding were collected in the HSHW 2008.

foreign currency (Swiss franc, Japanese yen). Slightly more than one-quarter of outstanding loans (26.3%) was denominated in foreign currency. In most cases, loans taken out were secured by a mortgage. The respondents claimed that 83.5% (in terms of volume) of their outstanding foreign currency loans were collateralized by mortgages. At 94.1%, the share of euro-denominated mortgage loans is even higher.

By European standards, the share of variable rate loans (ECB, 2009a) in Austria is rather high.[13] According to the HSHW 2008, the majority of households with outstanding loans (65.9%) had agreed to a variable interest rate when taking out their loans, while 41.0% opted for a fixed rate loan. 6.3% of the indebted households said they had been granted at least one interest-free loan (from family or friends).[14]

Three-fourths of households in the two youngest age groups have at least one variable rate loan outstanding. This percentage successively drops to 44% in the older age groups. In the higher income quartiles, the share of variable rate loans increases.

5 Conclusions and Outlook

Detailed information on the volume and distribution of real estate holdings and the prevalent home financing forms is a key prerequisite for monetary analysis and the assessment of financial stability. In view of the financial crisis, this issue has gained even more importance as the real estate market is closely tied to key economic sectors (e.g. construction) and developments in the housing market and in mortgage markets may, therefore, have a massive impact on growth and employment.

Housing wealth and estates in land account for the biggest share of households' assets. At 50%, the ownership rate in Austria is higher than in Germany (40%) but by far lower than in Spain (close to 90%). Within Austria, real estate ownership has a strong regional dimension, featuring clearly lower rates in Vienna than in the rest of Austria. In the primary residence category, the average value of household real estate wealth in Austria is estimated at EUR 130,000 (EUR 110,000 excluding the top 1% of observations in the real estate wealth distribution of the

Table 9

Households with Outstanding Loans − Breakdown by Type of Interest Rate

	Fixed rate	Variable rate	Interest-free
	% of households		
Share in all home owners with outstanding loans	41.0	65.9	6.3
Share in all home owners	13.6	21.9	2.1
Share in all households (home owners and tenants)	6.8	10.9	1.0

Source: HSHW 2008.

Note: Figures may not add up to 100% because households may have more than one loan outstanding.

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[13] For fixed rate loans, a fixed interest rate is stipulated and applied over the entire duration of the loan. Loans with a combined fixed and variable interest rate were counted as variable rate loans. This implies a "broader" view of households' interest rate sensitivity, which means that the effectiveness of monetary policy action is possibly (somewhat) overestimated. Another consideration in choosing this approach was that, in the case of combined interest rate schemes, a longer variable-rate period usually follows a short initial fixed-interest period.

[14] The sample size for the group of households with outstanding interest-free loans is rather small (n<50), however.

primary residence), and the average value of total real estate holdings per household is EUR 250,000 (EUR 200,000 excluding the top 1% of observations in the total real estate wealth distribution). The total value of Austrian households' real estate holdings is estimated at a minimum of EUR 690 billion.

Previously, reliable data sources for estimating housing wealth were not available in Austria. This study presents the first microdata-based estimation of housing wealth that is in line with international standards; it was carried out within a comprehensive Eurosystem project. Microdata are preferable because they facilitate the identification of the percentage of households that are subject to (financial) risks. The significance of housing wealth for households' portfolio and consumption decisions and thus for economic policy measures (especially for measures burdening

households) has become particularly evident in the current financial crisis.

The present HSHW 2008 forms the basis for further studies on a variety of important issues. Further analyses are specifically envisaged for topics such as household debt, the identification of particularly debt-burdened households, foreign currency loans, determinants of holding real estate and issues concerning the distribution of real estate wealth or intergenerational transfers of real estate wealth. At the same time, fundamental methodological work will deal with the applied multiple imputation method, the various approaches to determining the current value of households' real estate holdings and various equivalence income calculations. Together with the corresponding results on households' financial wealth, the findings will be incorporated into the comprehensive Eurosystem analyses of the euro area as a whole.

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Annex

Ownership of Primary Residences

	Frequency	Ownership rate	Home owners only			
			All observations		Excluding top 1%	
			Mean value	Median	Mean value	Median
	Number	%	EUR			
Total	1,038	49.9	260,000	200,000	230,000	200,000
By age						
18 to 29 years	48	16.5	190,000	160,000	190,000	150,000
30 to 39 years	157	40.4	270,000	200,000	230,000	200,000
40 to 49 years	294	60.4	240,000	200,000	220,000	200,000
50 to 59 years	230	59.3	270,000	210,000	240,000	210,000
60 to 69 years	194	64.9	270,000	200,000	230,000	200,000
70 years or older	116	50.7	260,000	150,000	200,000	150,000
By highest level of education						
Compulsory education	162	45.2	220,000	170,000	200,000	170,000
Apprenticeship, vocational school, intermediate or higher technical/vocational school	616	52.5	260,000	200,000	230,000	200,000
High school (Matura)	136	41.3	260,000	200,000	220,000	190,000
College, university, academy	124	56.1	300,000	230,000	250,000	220,000
By occupation						
Self-employed persons, entrepreneurs	69	64.6	330,000	250,000	300,000	250,000
White-collar workers	275	44.4	220,000	200,000	220,000	200,000
Civil servants	71	60.5	240,000	210,000	240,000	210,000
Farmers	52	96.0	490,000	300,000	360,000	290,000
Blue-collar workers	135	40.9	220,000	180,000	190,000	170,000
Other occupational groups (contractors, free agents, etc.)	41	47.6	200,000	150,000	190,000	150,000
Retired persons	318	58.0	270,000	200,000	210,000	190,000
Not gainfully employed persons (pupils, students, on home duties, unemployed, on parental leave)	77	35.1	230,000	200,000	230,000	200,000
By net household income						
Up to EUR 795	68	36.4	290,000	200,000	240,000	200,000
EUR 796 to EUR 1,432	195	38.0	210,000	150,000	180,000	150,000
EUR 1,433 to EUR 2,388	301	51.1	230,000	180,000	200,000	180,000
EUR 2,389 to EUR 3,185	201	56.4	280,000	200,000	220,000	200,000
EUR 3,186 to EUR 4,999	177	62.5	310,000	250,000	290,000	250,000
EUR 5,000 or more	96	62.5	290,000	250,000	280,000	250,000
By location						
Rest of Austria	947	59.3	260,000	200,000	230,000	200,000
Vienna	91	18.8	260,000	190,000	230,000	180,000
By household size						
1 person	256	35.1	220,000	160,000	190,000	160,000
2 persons	319	53.5	250,000	200,000	220,000	200,000
3 persons	191	57.4	230,000	200,000	220,000	200,000
4 persons	174	63.1	270,000	230,000	260,000	230,000
5 or more persons	98	66.5	390,000	280,000	300,000	270,000
By marital status[1]						
Single	169	32.0	210,000	150,000	180,000	150,000
Married	652	62.2	280,000	220,000	240,000	220,000
Divorced	111	36.4	220,000	160,000	190,000	160,000
Widowed	105	53.1	250,000	180,000	220,000	180,000

Source: HSHW 2008.

[1] Available information on other types of partnership is not reported separately.

Total Real Estate Holdings (Primary Residences and Other Real Estate)

	Frequency	Ownership rate	Home owners only			
			All observations		Excluding top 1%	
			Mean value	Median	Mean value	Median
	Number	%	EUR			
Total	1,230	59.1	420,000	220,000	330,000	210,000
By age						
18 to 29 years	63	21.4	340,000	160,000	310,000	160,000
30 to 39 years	211	54.2	400,000	200,000	310,000	200,000
40 to 49 years	350	72.1	370,000	220,000	300,000	220,000
50 to 59 years	269	69.4	540,000	250,000	390,000	240,000
60 to 69 years	212	71.2	390,000	220,000	340,000	220,000
70 years or older	125	55.0	440,000	180,000	330,000	180,000
By highest level of education						
Compulsory education	179	50.1	420,000	200,000	300,000	190,000
Apprenticeship, vocational school, intermediate or higher technical/vocational school	725	61.8	420,000	220,000	330,000	220,000
High school (Matura)	169	51.1	410,000	200,000	330,000	200,000
College, university, academy	158	71.4	430,000	250,000	390,000	250,000
By occupation						
Self-employed persons, entrepreneurs	81	76.2	490,000	300,000	400,000	280,000
White-collar workers	356	57.5	340,000	200,000	300,000	200,000
Civil servants	95	81.7	360,000	250,000	340,000	240,000
Farmers	54	100.0	620,000	440,000	530,000	420,000
Blue-collar workers	160	48.2	550,000	200,000	310,000	190,000
Other occupational groups (contractors, free agents, etc.)	53	61.0	300,000	180,000	270,000	160,000
Retired persons	341	62.2	420,000	210,000	330,000	200,000
Not gainfully employed persons (pupils, students, on home duties, unemployed, on parental leave)	90	41.3	460,000	220,000	340,000	210,000
By net household income						
Up to EUR 795	78	42.0	500,000	220,000	380,000	220,000
EUR 796 to EUR 1,432	225	43.8	280,000	170,000	270,000	170,000
EUR 1,433 to EUR 2,388	352	59.9	340,000	200,000	280,000	200,000
EUR 2,389 to EUR 3,185	242	68.1	470,000	220,000	320,000	200,000
EUR 3,186 to EUR 4,999	212	74.5	550,000	280,000	400,000	270,000
EUR 5,000 or more	121	78.9	550,000	300,000	490,000	300,000
By location						
Rest of Austria	1,032	64.6	400,000	220,000	330,000	220,000
Vienna	199	40.9	500,000	200,000	360,000	200,000
By household size						
1 person	319	43.7	370,000	180,000	310,000	180,000
2 persons	386	64.7	450,000	200,000	330,000	200,000
3 persons	220	66.3	430,000	220,000	330,000	210,000
4 persons	195	70.6	360,000	250,000	330,000	250,000
5 or more persons	111	75.3	530,000	300,000	430,000	300,000
By marital status[1]						
Single	204	38.5	350,000	190,000	320,000	190,000
Married	760	72.6	450,000	250,000	350,000	240,000
Divorced	151	49.5	350,000	180,000	290,000	180,000
Widowed	115	57.8	460,000	200,000	310,000	200,000

Source: HSHW 2008.

[1] *Available information on other types of partnership is not reported separately.*

Highlights

Beyond the Crisis: Economic Policy in a New Macroeconomic Environment – Summary of the 37th Economics Conference

Ernest Gnan,
Burkhard Raunig

The 37th Economics Conference of the Oesterreichische Nationalbank (OeNB) on May 14 and 15, 2009, addressed the question as to whether the current situation – which may go down in economic history as the "Great Crisis" – may lead to lasting changes in the relationship between government and markets. The conference brought together distinguished representatives from the world of politics, business, central banks and science to discuss this topic.

From the "Great Moderation" to the "Great Crisis" – What Will Happen Next?

The last two decades until the first half of 2007 had been characterized by favorable macroeconomic conditions worldwide, involving moderate economic cycles along with very low and stable rates of inflation – a phenomenon called the Great Moderation by economists. The financial crisis that started in mid-2007, along with the severe subsequent downturn in the world's economy, raises the question as to whether this Great Moderation was a prolonged phase of fortunate coincidences or the temporarily favorable consequence of a bubble rather than the outcome of good economic policies. What caused the asset price bubble and its subsequent collapse? Could we have avoided this bubble, and thus the crisis, with different economic policies, i.e. different monetary and fiscal policies along with more stringent financial market regulation? What are the appropriate solutions for overcoming the crisis? What lessons can we learn from the current situation, in order to avoid similar crises in future or at least cushion their effects on financial market stability and the real economy?

Against the backdrop of these hot issues, this year's Economics Conference addressed in particular the question of how much of a lasting effect the current situation – which may go down in economic history as the Great Crisis – might

have on the relationship between government and markets. The conference was divided into three sessions. In Session 1, high-ranking economic policymakers discussed the consequences of the crisis on monetary and economic policies and on financial market supervision. Session 2 provided insights into the latest findings of crisis research and their implications for economic policy. Session 3 applied the insights gained to Austrian economic policy.

Ewald Nowotny, Governor of the OeNB, who also chaired the first morning of the conference, opened the 37th Economics Conference with some fundamental remarks about the current economic crisis and solutions provided by economic policy. He recalled that the current economic situation was marked by worldwide problems in the banking sector and a global contraction of the real economy. This particular combination of factors required strategically coordinated macroeconomic policies – a point on which economists and economic policymakers were largely in agreement. The important thing was to raise aggregate demand, to strengthen bank balance sheets and to ensure the functioning of the credit system. This, in turn, required a well-chosen combination of expansionary monetary and fiscal policy measures. In lowering the key interest rate and providing liquidity to the banking system, the ECB had used the traditional monetary policy instruments in the current crisis. This

had helped to ease tensions in the lending market. Governor Nowotny stressed that the range of measures taken was unlikely to stoke inflation. According to short-term inflation expectations, forecasts of the degree of capacity utilization in the real economy, as well as data on credit and monetary growth developments, there were no signs of inflation risks.

Crisis situations may call for monetary policy measures that go beyond the traditional operational framework of monetary policy. One possibility was for central banks to buy bonds and other financial assets outright, and the ECB had created the necessary framework conditions for making such purchases.

Besides monetary policy, which was a crucial pillar of crisis management, expansionary fiscal policies played a special role in strengthening aggregate market demand. In this context, Governor Nowotny stressed the importance of establishing an exit strategy upfront, in order to be able to return to a clearly defined path of fiscal consolidation.

The implementation of the Eurosystem's monetary policy measures and national crisis management required strong national central banks with the capacity to take adequate action. Nowotny emphasized that the OeNB was able to cope with these demands and that it also contributed directly to ensuring the stability of the financial market through its banking supervision activities.

The "Great Crisis" as a Turning Point for Economic Policy?

Session 1 of the conference addressed the question to what extent the *crisis would act as a turning point for economic policy. Werner Faymann, Federal Chancellor of the Republic of Austria,* presented *"Considerations about the current economic situation: What will happen next?"* He high-

lighted two aspects in particular, namely the social dimension of the crisis and measures to prevent further crises. With a further rise in unemployment looming in Austria and in Europe, social responsibility was playing a particularly important role. Upholding social standards was especially crucial in times of distress. Particular emphasis must be put on combating unemployment. In this respect, the stability of the financial system was of vital importance. Currently, the most important goal was to keep the crisis period as short as possible. According to Faymann, the government had to raise public understanding for the economic measures taken, in order to ensure confidence and counter misleading arguments. The financial support package for banks had created a safety net and thus contributed to strengthening trust in the Austrian banking sector. In addition, the fiscal stimulus package was driven by the need to support domestic demand. After all, investment in infrastructure, education and research and development was of particular importance in times of crisis. Faymann also pointed out that the measures taken were naturally putting a strain on the budget and that policymakers were fully aware that the fiscal stimulus would have to be unwound at some point. This notwithstanding, securing social stability remained the primary goal.

Turning to the issue of financial market regulation, Chancellor Faymann pointed out that there must be a consensus regarding regulation in order to prevent future crisis episodes. He called for strengthening financial market controls and increasing transparency. In particular, there was a need to discourage speculation with food commodities and similar speculation transactions. Relying solely on self-regulation of the

market was simply not enough. Spending on research and development must not be reduced, since such spending constituted an investment in the future. Indeed, Europe had to strive to regain the leading role in environmental technology.

Arnout H.E.M. Wellink, President of De Nederlandsche Bank and Chairman of the Basel Committee on Banking Supervision, advocated *"A new structure for European and global financial supervision,"* concentrating in particular on institutional conclusions and challenges arising from the present crisis. The crisis had once again highlighted the need to improve the institutional framework of financial market supervision in Europe. After all, the large financial institutions in Europe operated on a cross-border level, while supervision was organized on a national level. The exchange of information and cooperation between national financial supervisors was inadequate owing to a focus on national interests. Based on a suggestion by the De Larosière Group, a European Systemic Risk Council should be set up to strengthen macroprudential financial market supervision. Similarly, a European System of Financial Supervisors should be established to improve microprudential supervision. With regard to the European Systemic Risk Council, Wellink stressed that establishing the Council's mandate above all required clearly defining the scope of macroprudential analysis. This mandate should ideally be comprehensive. In order to enable the Council to carry out systemic risk analysis, it needed to have access to all necessary information. However, Wellink acknowledged that making company-specific data available could well be problematic.

A European System of Financial Supervisors functioning as a network of national financial supervisors and Euro-

pean authorities would be faced with a range of new tasks that required the transfer of national decision-making power to a European level. The creation of such a network would be a welcome step, but certain necessary conditions would have to be fulfilled according to Wellink. Above all, the issue of burden sharing in such a system would have to be addressed. Burden sharing arrangements would have to be incentive-compatible and legally binding. Therefore, Wellink advocated a combination of general and specific burden sharing. The general part should ideally be based on proportionate contributions by the individual Member States depending on the size of their economies. This part should be relatively small, since it would involve cross-border fiscal transfers. The specific part should be based on contributions by countries with financial institutions in distress. Wellink finished by pointing out that financial stability in Europe was also dependent on the quality of supervision outside Europe. Key global players, such as rating agencies or hedge funds, which had thus far gone (largely) unregulated, would have to be subjected to direct and more comprehensive supervision from now on.

As the final speaker of the first session, *Lucas D. Papademos, Vice-President of the ECB,* addressed *"Monetary policy and the 'Great Crisis': Lessons and challenges."* Papademos highlighted the unprecedented magnitude of the monetary policy easing and the comprehensive provision of liquidity with which the Eurosystem had combated the crisis. By the end of April 2009, the balance sheet of the Eurosystem had increased to the equivalent of 16% of euro area GDP. By comparison, the Federal Reserve System's balance sheet amounted to 14% of U.S. GDP. These measures had helped smooth tensions in financial

markets considerably. However, the deleveraging of banks' balance sheets had led to supply-side credit restrictions. Government capital injections and guarantees were crucial for avoiding a vicious cycle of financial asset writedowns and recession in the real economy. The exceptionally expansionary monetary policy measures taken by the Eurosystem would have to be accompanied early on by designing appropriate exit strategies for the period after the crisis. In particular, policymakers had to make sure that inflation expectations were kept firmly anchored at levels consistent with price stability. When the economy recovered, the currently very low money multiplier would increase again, and this would have to be reflected by a reduction in the provision of liquidity by the Eurosystem. Removing the dependence of the financial and economic system on support measures was also necessary. The measures would have to be unwound swiftly as soon as the end of the crisis was in sight. The ECB would inform the markets of any unwinding measures in good time.

Papademos argued that in future, asset prices should be considered more strongly in monetary policymaking. He maintained that monetary policymakers should implement an appropriate interest rate policy to prevent asset price bubbles from occurring in the first place instead of attempting to limit the effects of these bubbles bursting through monetary easing. Such a symmetric monetary policy would alter the incentives for the financial system so that asset price bubbles would be less likely to emerge. Maintaining price stability would thus be easier for the Eurosystem, since the deflation risk associated with financial crises would be avoided. According to Papademos, "leaning against the wind" would be

compatible with the Eurosystem's two-pillar monetary policy strategy, as dangerous price bubbles were usually accompanied by excessive money and credit growth. Even small interest rate changes, especially in tandem with appropriate communication, could be sufficient to help prevent asset price bubbles, since investment strategies driving asset prices were very sensitive to changes in the yield curve and herd behavior could be prevented by suitable central bank signals. Papademos emphasized that monetary policy measures should be complemented by other, national economic policy measures (fiscal policy, regulatory and supervisory framework), especially in cases of national or regional asset price bubbles. After all, with one single instrument (the key interest rate) monetary policy could not pursue several different economic policy goals at once.

Will We Have to Redraw the Boundaries Between Government and Markets?

The afternoon session dealt with lessons from academic research for future economic policy and was chaired by *Peter Zöllner, Executive Director of the OeNB*. In the first panel, Josef Falkinger of the University of Zurich and Dennis J. Snower, President of the Kiel Institute for the World Economy discussed the *need to redraw the boundaries between government and markets. Josef Falkinger* argued that the boundaries between government and markets were in fact clearly defined by welfare economics. Assuming rational agents, complete markets and perfect competition, the market outcome was efficient on balance; the question of distribution had to be determined by politics and not by the markets themselves. Falkinger underlined that these assumptions were unrealistic, however. Over the past

15 years, economic research had taken wrong turnings in its strategic approach. First, the focus of interest had shifted from the real economy to finance. At the same time, people had assumed that financial innovation was a panacea for any market imperfections. Public economics, in contrast to many other fields of economics, had failed to adequately research and study market imperfections, such as monopolistic competition, rents, various frictions and transaction costs. Second, the significance of multiple economic policy targets had not been fully recognized any more.

In light of the rising government spending ratio associated with crisis management measures, the crisis would strengthen the role of governments considerably and for some time in dealings with the market. Whether the governments would be able to meet these increased requirements was as yet unclear, however. Even the structure of government spending had been changed by the crisis. Falkinger argued that the concept of a choice between government and markets was basically too narrow, as society was much more than just the sum of the two. Governments did not automatically stand for critical long-term thinking, and the markets could in fact carry out these functions. After all, herd behavior or irrational exaggeration were not limited to financial markets. Such phenomena could also be observed with elections, public opinion formation, media dynamics, economic research etc. Critical thinking and learning from success were the factors necessary to combat these phenomena. Rules and laws needed to be complemented by values and social norms.

Dennis J. Snower identified areas of economic policy that economic research needed to address more closely.

The Reagan-Thatcher revolution had been based on several consistent principles: strengthening private markets, increasing incentives through low taxes, focusing on healthy public finances, creating wealth instead of redistributing it, and implementing monetarist principles in monetary policy. Snower questioned whether this market experiment was at an end and the role of governments and markets had to be redefined. He criticized that free financial markets did not reward real productivity that benefited the whole economy, but rather created considerable inefficiency, and underscored that in a new system, productive real economic activity had to be rewarded once more. Competition should be promoted again, as this had not been the case over the last few years. Social justice goals had to be made compatible with wealth creation by implementing suitable incentives.

Based on these ideas, Snower made three general recommendations for economic policy. First, the solvency problem had to be overcome in the financial sector. Systemically relevant institutions that were "too big to fail" had to be either broken up (a very difficult task) or they had to be given a solvency guarantee, which should be largely financed by the shareholders and bond owners (via obligatory debt-for-equity swaps in case of a crisis), while at the same time being subjected to stringent regulation and supervision. This would likely lead to an increase in financing costs, which would be desirable according to Snower, since these costs would include risk provisions. Second, he advocated the creation of independent budget monitoring bodies in the field of fiscal policy, following the successful example of independent central banks. These bodies would bring fiscal policy in line with the economic cycle, while

at the same time ensuring that the public debt ratio did not rise. Third, the effect of automatic stabilizers should be strengthened, for example by introducing employment cheques for enterprises hiring long-term unemployed persons; the amount of these cheques would automatically increase with the period worked. Since our ability to predict crises was limited, automatic mechanisms were more effective than discretionary policies. Such measures would change the boundaries between markets and government in that they would help markets function better without returning to a state-administered economy.

Rethinking Financial Regulation: Policy versus Market Failures

The second panel focused on *"Rethinking Financial Regulation: Policy or Market Failure." Martin Hellwig, Director of the Max Planck Institute for Research on Collective Goods in Bonn,* analyzed the causes of the financial crisis. He underscored that, in order to understand the crisis, we had to study the mechanisms that contributed to the subprime mortgage crisis spilling over to the entire financial system. He identified three main causes of the crisis: flaws in subprime mortgage lending and securitization, flaws in the financial structure of financial intermediaries and flaws in the financial system's architecture. Between 2003 and 2006/2007, the activity of private investment banks on the subprime mortgage market increased dramatically. Over the same period, however, the quality of the mortgages decreased constantly. Risk premiums in this market segment fell, even though risk appetites remained the same. This was attributable to investment banks' heavy involvement in mortgage securitization and to investors' search for high yields. These investors, predominantly

hedge funds and investment banks from the U.S.A. and Europe, gave too little thought to the inherent risk. Rating agencies also underestimated the risk involved in these securitizations. In summer 2006, real estate prices began to fall, and when rating agencies drastically downgraded mortgage-backed securities in August 2007, the market price of these securities dropped substantially. The subsequent losses and refinancing problems of the financial institutions affected caused the subprime crisis to spread to the entire financial system. Mutual mistrust brought about the temporary collapse of the interbank lending market, during which only central banks could provide the necessary liquidity. A lack of risk awareness, the search for yield, flawed risk management, rating agencies, and the expansionary monetary policy between 2002 and 2004 were important individual causes of the crisis according to Hellwig. Insufficient credit-worthiness assessments, weak quality standards at the banks, a lack of regulation of credit derivatives and insufficient analysis and consideration of systemic risk by regulators were all proof of a faulty system design.

Javier Suarez, Professor at the Centro de Estudios Monetarios y Financieros, Madrid, made a case for introducing liquidity insurance as a complement to capital requirements so as to lessen the impact of systemic crises. This insurance would be financed by a mandatory liquidity charge to be paid to a supervisor. The charge should be set in such a way as to discourage financial strategies that would create systemic risk for all market participants. Revenues from this charge would go into an emergency fund with legal autonomy that would provide liquidity, and perhaps also capital injections, to banks in case of a systemic crisis. These liquidity charges paid by the banks and the existence of

an emergency fund would probably make government intervention politically more acceptable. The suggested liquidity insurance system should ideally be implemented on an international level. The charges paid by the individual countries' banking sectors would represent ex ante established burden sharing in the case of an international banking crisis.

Fixing the Crisis: The Role of Regulation and Monetary Policy

The afternoon was completed by a panel discussion on *"Fixing the Crisis: The Role of Regulation and Monetary Policy." Axel Leijonhufvud, Professor Emeritus at the Department of Economics, University of California, Los Angeles,* underscored that economic policy and regulatory measures had to address the macroeconomic level as well as the regulation of financial institutions and instruments. It had turned out that the widespread monetary policy strategy of inflation targeting based exclusively on the development of consumer prices was more problematic than originally thought. This strategy only considered consumer price inflation (CPI), but not macroeconomic price levels. A too expansionary monetary policy could, however, materialize in rising asset and real estate prices without causing a notable increase in the CPI. Central banks should therefore consider not just pursuing a narrow CPI target, but also aim at stabilizing broader price levels. It was further necessary to limit leverage of financial institutions, improve the regulation of structured financial products and raise the transparency standards linked to these products.

Adam S. Posen, Deputy Director at the Peterson Institute for International Economics, Washington D.C., argued that monetary policy had a limited role to play in combating price bubbles on financial markets. Owing to inflation targeting, inflation expectations were very stable according to empirical evidence. He maintained that monetary policy should be used to achieve monetary policy targets and not to solve problems on financial markets. These should be countered with regulatory measures. It was not a given that central banks should perform supervisory functions. Evidence from several countries showed that there was no obvious correlation between banking supervision being carried out by central banks and the frequency of financial crises. In addition, he maintained that the central bank policy of "leaning against the wind" had never been successful in preventing financial market bubbles, and that there was no empirically stable relationship between monetary policy and asset prices. Posen concluded by pointing out that central bank independence was not the same thing as inactivity: An independent central bank could certainly – on its own accord – cooperate with fiscal authorities.

Important Role of Fiscal and Monetary Policy in Fighting Recession; Challenge of Budget Consolidation and Exit Strategies

In the evening discussion *(Kaminge-spräch),* Lucas D. Papademos, Marco Kranjic and Ewald Nowotny addressed *topical issues of monetary and economic policy.* First, *Lucas D. Papademos* focused on how to encourage banks to resume lending. The financial and real economic crisis were currently mutually reinforcing: The deep recession led to a higher number of credit defaults, which, in turn, further limited lending and caused the recession to get even worse, thus involving the danger of a vicious cycle. Extraordinary expansionary monetary and liquidity policy measures taken by the central banks in

combination with bank support packages launched by governments had been basically successful in restarting lending. The continued deceleration of credit growth was not necessarily (or not predominantly) a supply-side phenomenon, but rather a reflection of weak credit demand. Papademos also broached the issue of the soaring budget deficit in the euro area countries – the average deficit in the euro area in 2009 would be about 5½%. Around 2 percentage points of this increase was due to discretionary expansionary measures, while another part was due to the effect of automatic stabilizers and other factors. Expansionary fiscal policy was currently completely appropriate, but a budget consolidation strategy was urgently required for the time after the crisis in order to ensure confidence in the sustainability, and thus effectiveness, of fiscal policy. A swift deficit reduction was also necessary in light of the fact that the debt ratio would otherwise increase greatly, or else budget crises could well follow the financial crisis. If governments failed to achieve the necessary consolidation, the Eurosystem would have to rely on monetary tightening to counter the associated possible inflation risks.

In general, modesty was in order about what monetary policy could achieve. For this reason, the EU Treaty clearly stated that maintaining price stability was the Eurosystem's primary objective. With regard to inflation targeting, Papademos confirmed that a clear definition of price stability was useful to be able to judge the success of central bank policy. If interpreted too narrowly over too short a time horizon, however, strict inflation targeting could also be misleading. The monetary strategy of the Eurosystem therefore combined a precise quantitative definition of price stability with the neces-

sary flexibility in the time horizon applied for achieving this target.

Marco Kranjic confirmed that, for small countries in particular, weak credit demand reflected low investment demand, which in turn could be explained by poor sales prospects. Euro area membership made it much easier for small countries like Slovenia to obtain international credit. Kranjic underscored that any future institutional reform of European and global macroprudential supervision should be designed so as to avoid overlapping.

Ewald Nowotny addressed the exposure of Austrian banks in the Central and Eastern European countries (CEECs). He underlined that, in actual fact, there was little difference between exposure to a Western European country and that to CEECs, and that risk assessment depended on both the country and debtor in question. In addition, other countries had a much greater foreign exposure in relation to their economic power than Austria. The credit volume was still growing in Austria, albeit only slightly. However, there were substantial differences in the development of individual sectors and credit market segments, with large firms tending to suffer more from supply-side limitations. For this reason, the Austrian federal government had decided to set up a credit guarantee scheme worth up to EUR 10 billion for key businesses. In Austria, as in other countries, the current deep recession was causing a marked increase in the government deficit ratio. Nowotny stressed that the existing flexibility of the Stability and Growth Pact (SGP) was being used sensibly at present, but as soon as the economy recovered, governments had to proceed with fiscal consolidation in line with the SGP. The IMF had an extremely important role to play in dealing with the crisis. The exact form in

which the EU and the euro area countries should be represented in the IMF was, however, still unclear. Central banks were in fact almost the only institutions that could maintain financial stability in emergencies. With regard to investments supported by economic stimulus packages, Nowotny underscored that their usefulness depended on how the funds were used – energy-saving investments, for instance, made sense, as they also supported long-term stability by reducing dependence on fossil fuels.

How Can a Small, Open Economy like Austria Be Protected against International Shocks?

The morning of the second conference day was dedicated to possible *economic policy solutions at the national level and lessons for Austria.* The session was chaired by *Wolfgang Duchatczek, Vice Governor of the OeNB.* In the first panel, Karl Aiginger, Director of the Austrian Institute of Economic Research, Vienna, and Michael Landesmann, Director of Research at The Vienna Institute for International Economic Studies, discussed about the degree *to which a small, open economy like Austria could be shielded from large, international shocks and looked at strategies for achieving greater shock resistance.*

Karl Aiginger called for the fast implementation of economic stimulus packages in view of very weak growth in Austria in the first quarter of 2009. The question was how Austria could protect itself from a repeat of such a crisis without adversely affecting growth and employment and without sacrificing international openness. Aiginger identified five levels of action: First, the production structure should be made more crisis-proof. Among other things, this could be achieved by greater regional diversification of exports and by strengthening the role of automatic sta-

bilizers in the new budget law. Second, a higher growth path should be attained through education, innovation and a supply-friendly budget structure. The third level of action involved a focus on longer-term goals and economic indicators. In particular, this also included appropriate incentives for managers. Moreover, incentives for setting up companies should be improved, and wage policy, in order to be countercyclical, should be guided by long-term productivity developments, not short-term swings. The principle of prudence should be promoted in accounting. The fourth level of action was avoiding factors that increase the amplitude of business cycles. Mergers and acquisitions should be viewed more critically, as large conglomerates could increase vulnerability to crisis and reduce competition. The procyclicality of research expenditure should be eliminated, and governments should smooth research funding over the economic cycle. A higher return on equity and stable shareholder structures would promote a longer-term focus. The fifth level of action was about institutional improvement. The general government budget should achieve a considerable surplus in economic booms to create more room for maneuver in times of crisis. Ready-to-go infrastructure projects should be lined up and implemented in case of crisis, and companies with a convincing strategic business plan should be supported. Measures combating unemployment should be future-oriented, e.g. by promoting further education and training. Aiginger underscored that a country's ability to deal with a crisis greatly depended on its economic capacity, and this factor should be considered much more seriously by international analysts and rating agencies.

Michael Landesmann put the current crisis into historical context. Austria

had pursued an expansionary, proactive economic strategy since the 1990s, the openness of the economy had increased and the service sector had gained in importance. Austria had become an exporting country, both in terms of trade and direct investment. The outcome of this striking development was now for the first time being tested for its resilience in a crisis. While the first phase of the crisis had been barely felt in Austria, the second phase manifested itself in a massive increase in risk premiums, which affected Austria just like other countries. A considerable crisis impact was felt during the third phase as export prospects turned gloomier.

The CEECs were also hit by the international financial crisis. Growth in the CEECs (like in other emerging economies) was dependent on capital inflows, and the resulting current account deficits made these countries even more vulnerable to the crisis. Naturally, developments were heterogeneous across individual countries. There were two economic policy responses – a significant real devaluation and/or a deliberate strong restriction of economic growth – and both had been explored and implemented. Both responses also had direct consequences for the Austrian economy: Exports collapsed and open foreign exchange exposures became an issue in the banking system. The gloomier longer-term growth outlook and increased loan defaults further contributed to a worsening of economic conditions. The CEECs' economic policy responses were relatively passive owing to their limited access to international capital. The private sector was marked by balance sheet adjustments so that domestic demand declined, and only the real devaluations will have a lagged expansionary effect.

How can a small, open economy be protected against such shocks? Landesmann maintained that Austria's economic structure had become more diversified over the last few years, labor market policy in the last 10 to 15 years had helped increase crisis resilience, and a flexible business sector had developed that could react flexibly to crises. He underscored that external and internal imbalances should be controlled in normal economic situations in order to create countercyclical leeway for crises. The banking and financial system should be regulated so as to avoid excessive financial leverage as well as insufficient diversification and risk provisioning. Austria was a financial hub that also played an important role in the development of Eastern Europe; maintaining stability was in the interests of all of Europe.

International Support Packages for Eastern Europe and Austria's Bank Bailout Package Have Helped Safeguard Financial Stability

The second panel discussion focused on the *Austrian experience with bank rescue packages and first lessons for the future. Rainer Münz, Head of Research and Development at Erste Group Bank AG,* differentiated between three types of government measures to help the banking system: capital injections, credit guarantees and taking over toxic assets. The third type was dominant in the U.S.A. and the only measure implemented so far in Switzerland. The volume of capital injections was largest in the U.S.A. at about 50% of GDP; in Austria, the bank rescue package amounted to about ⅓ of GDP, while it was much smaller in Spain and Switzerland at ⅕ and ⅙, respectively. Erste Bank made use of the bank rescue package by issuing hybrid capital and government-guaran-

teed bonds. The coupon rate for the participation capital was 8% if covered by profits, and after five years the dividend would rise successively if the capital had not been paid back by then. In numerous CEECs, international rescue packages had already been arranged or were being prepared, and national economic stimulus packages – albeit limited ones – had been launched to mitigate the effects of the crisis. Most CEECs had lower debt ratios than many Western European countries, which limited debt servicing costs and helped medium-term growth prospects in the region. After the crisis, politicians would have to take the important economic policy decision whether the debt ratio should remain high, leading to markedly higher financing costs, or a swift debt reduction should be achieved by means of primary surpluses.

Andreas Ittner, Executive Director of the OeNB, pointed out that the current bank packages benefited the whole economy. Austria had early on and pro-actively supported rescue programs for the CEECs as this was in the interest of European and global financial stability. The IMF's support programs were already beginning to take effect. Banks active in Eastern Europe undoubtedly had to increase risk provisioning. The exposure of Austrian banks to Eastern Europe was highly diversified and amounted to about EUR 200 billion, thus accounting for some 20% of the total exposure of all foreign banks to the region. The Austrian bank support package aimed at encouraging banks to resume lending and ensuring financial market stability. Its volume was set suitably high to take account of potential credit defaults. According to Ittner, the existing support packages had greatly increased the Austrian banks' risk-bearing capacity. The conditions banks had to fulfill in order to receive

funds were defined with a view to balancing financial market stabilization and ensuring a level-playing field. The crisis highlighted the need to take action at the European level. In the medium term, banks would have to impose more stringent risk control, and capital ratios would have to be raised. Large banks that were "too big to fail" would also have to bear higher costs for implicit default guarantees by governments. A higher degree of regulation also involved economic costs (lower return on equity, lower credit volumes). Any reform of bank regulation must therefore be carried out with a sense of proportion.

According to *Helmut Ettl, Executive Director of the Austrian Financial Market Authority,* the bank rescue packages had stabilized the financial system, while at the same time changing the rules. These packages had been the appropriate response to the crisis – without them, the financial system might have collapsed. Their implementation had made it clear that systemically relevant financial institutions would not be allowed to fail. In the long run, however, this guarantee for systemically relevant banks would change incentives permanently. To discourage these banks from taking on excessive risk, they would have to be supervised more strictly in future. Financial leverage had to be limited. The capital ratio had to remain high over the entire cycle, and the current procyclicality of regulatory capital requirements should be eliminated via regulatory changes. In addition, Ettl called for a reassessment of the role of rating agencies and of accounting rules. The regulation and supervision of large financial institutions operating across borders could only be effective if also regulators and supervisors operated on a cross-border level. A European banking supervisory authority along the lines of

the ESCB would be a good solution; simply promoting cooperation of national supervisors would not suffice. The single market for financial services needed an institutional counterpart in banking and financial market supervision.

Austria's Strategy in Eastern Europe: Chance of a Lifetime with (Manageable) Risk

The third panel discussion investigated whether *Austria's focus on Eastern Europe had been a source of fragility and asymmetric shocks.*

Silvia Sgherri of the IMF recalled the massive structural changes the financial systems of emerging economies had undergone over the past ten years. Financial integration allowed for risk diversification and better absorption of shocks. In the EU, financial market integration and the risk diversification this enabled had helped smooth economic fluctuations and had led to higher potential growth. Financial market integration also posed challenges, however, such as more rapid and stronger risk transfer between countries. Thus, the financial crisis that had originated in the U.S.A. had quickly spread to Europe – via asset prices as well as the credit channel – and had developed into a global economic crisis. At first, banks pursuing traditional business strategies had been barely affected by the crisis, but from fall 2008, they were also sucked into trouble because of increased risk aversion. Therefore, the whole of Europe was in the same boat facing a heavy storm. Notwithstanding the numerous parallel support measures taken, the crisis had revealed a lack of coordination between national financial market supervisors and insufficient information sharing. This lack of coordination (as e.g. apparent when it comes to rapidly conducting cross-border stress tests) was also an obstacle to efficient

crisis management. Creating an EU supervisory authority was required to establish clear and consistent rules regarding burden sharing. A highly integrated economic region like the EU also required a strong European economic policy framework. To resolve the crisis, we needed more Europe, not less. Euro area membership was also proving a great advantage in the crisis.

Bernhard Felderer, Director of the Institute for Advanced Studies, Vienna, argued that the shocks emanating from Western Europe were more severe and more dangerous for Austria than those from the CEECs. Over the last few years, many CEECs had gone through an impressive economic catching-up process that would continue after the crisis. The latest developments in industrial production and GDP forecasts until 2010 showed that a range of Eastern European countries were still affected less by the recession than many Western European countries. If Austria had no trade relations with the CEECs, the effects of the crisis on Austria's export trade would be much worse. Some 30% of Austrian exports went to Germany, about 9% to Italy. The overall share of Eastern European countries was 23%, that of euro area countries more than 51%. While almost one-half of Austrian outward direct investment was made in Eastern Europe, one-third was still made in EU-15 countries. Economic integration with Eastern Europe was by no means a specifically Austrian phenomenon, but rather applied to Western Europe in general. Felderer stressed that Austrian banks' foreign exposure was not excessive and their exposure was not solely concentrated in Eastern Europe. In addition, the debt ratios of households and enterprises were significantly lower in Eastern European countries than in Western Europe, as were public debt ratios (with

the exception of Hungary). Following marked currency depreciations in a number of Eastern European countries, especially in the fourth quarter of 2008, the currencies regained ground and partly recovered owing to the agreement of international support packages. According to Felderer, Austria's strategy in Eastern Europe – a logical step after the fall of the Iron Curtain – had not entailed extraordinary or unmanageable risks.

Walter Rothensteiner, Chairman of the Managing Board of Raiffeisen Zentralbank Österreich AG, refuted the claim that the Austrian banks had an overexposure to Eastern Europe. Austria's involvement was only logical in light of the country's historical and geographical ties with the region; it had been an opportunity that simply could not be missed. Expansion into Central and Eastern Europe had enabled Austria to reduce the economic dependence on Germany. Austria was the third-largest investor in the region after Germany and the Netherlands. Outward direct investment in Eastern Europe amounted to EUR 50 billion over the past 20 years. Eastward expansion had brought higher growth and employment. The exposure of Austrian banks in Eastern Europe was about EUR 200 billion – about one-half of the country's total foreign exposure – and was broadly diversified within the region. The financial aid packages provided by the IMF, the EBRD and the EU contributed to calming the situation. Rothensteiner emphasized that Austria had no alternative to its focus on Central and Eastern Europe. The fact that the Austrian labor market would soon be open to Eastern European workers highlighted the need to help the region develop further. In many Eastern European markets, the penetration with financial products remained well below average. For banks,

therefore, the growth potential in the region was still high. The convergence and catching-up process would continue after the crisis, with low wages, high education levels, low taxes and favorable exchange rates making the region extremely attractive as a business location.

Also Austrian Businesses and Employees Face Considerable Crisis Consequences – How to Use the Crisis as an Opportunity

The morning's fourth and last panel discussion focused on the *economic consequences of the Great Crisis for Austrian businesses and employees and asked how economic policy could help.*

Monika Kircher-Kohl, CEO of Infineon Technologies Austria AG, started by quoting Schumpeter who said that every crisis had creative and destructive potential. The key question was how to proceed after the crisis. In every crisis, market shares were reshuffled, former market leaders collapsed and smaller competitors got their chance. The same was true for entire regions. The question was, therefore, how Austria could influence these developments in such a way that the country would emerge stronger from the crisis. According to Kircher-Kohl, the semiconductor industry had always been extremely dependent on the general economic situation. In the early 2000s, for example, semiconductor production had fluctuated by about 60 percentage points. As a rule, the sector was leading macroeconomic developments by half a year or three-quarters of a year. Thus, it had two quarters of recession behind it and the situation was already improving in the current quarter. The semiconductor industry was marked by intense competitive pressure and a high level of innovation, with the latter also driving innovation in downstream sectors. This

was why the location of the microelectronics industry was crucial for regional economic development. Microelectronics could also make a large contribution to structural improvements, e.g. by improving energy efficiency. Proactive industrial and technological policy should invest more effort in creating new structures and tackling new issues, rather than in maintaining existing structures. Kircher-Kohl called for celebrating innovation. Avoiding risk should not be the main focus, as innovation was the only long-term job guarantee. Austria should have had an innovation strategy in place before the onset of the crisis, so that this strategy could have been reinforced during the crisis. In the current situation, people had to focus on the potential opportunities that would open up after the crisis. While the current government guarantees for business financing came late, they were nevertheless crucial for further development. We did not have to sacrifice our values and culture in the crisis; rather, we needed leadership in a positive sense, both in businesses and on a national and global level.

Erich Foglar, Acting President of the Austrian Trade Union Federation, addressed the effects of the crisis on employees. The approaches companies adopted during the crisis varied widely: While some found highly cooperative and constructive solutions, others introduced short-term working arrangements, still others demanded "voluntary" wage cuts or even relied on layoffs. Over the past 20 years, the dominance of shareholder value had created a system flaw. Foglar called on policymakers to use the crisis as an opportunity to adopt a new perspective. Wealth had not increased for everybody and wealth distribution had become more unfair. Economic policy had not kept pace with economic liberalization,

leading to wage dumping, tax dumping, social system dumping and careless treatment of the environment. The collapse of LTCM, at the very latest, should have set alarm bells ringing, and policymakers should have taken action immediately but failed to do so due to pressure from the finance lobby. As soon as the crisis was over, policymakers had to resolve the question of how to reduce deficit and debt levels. Foglar underscored that this must not be done via cutbacks in the pension and healthcare systems. The U.S. real estate crisis had been caused by the fact that wages were too low for parts of the U.S. working population. Reducing unemployment was a top priority in the current situation. The EU should be more aware of its market power, show more self-confidence and protect the welfare state. According to Foglar, Austria was well-positioned to deal with the crisis. Education and training were the key for future prosperity, and suitable industrial and immigration policies were further success factors.

Markus Beyrer, Director General of the Federation of Austrian Industries, stressed the importance of the EU in dealing with the crisis. Many national economic stimulus packages had included certain protectionist elements, at least in the beginning, and such tendencies had to be resisted. Still, governments today were less eager to turn to protectionist measures than they had been during the Great Depression of the 1930s. Successful solutions would have to combine the stabilizing power of the state and dynamic market forces. Without industry, there could be no growth in Austria; the multiplier effect of Austria's key industrial businesses and their role as growth drivers became especially apparent during the crisis, which was why these businesses had to be supported. Long-term financing and

large companies were particularly affected by credit restrictions, and the federal government's latest measures to provide guarantees for business loans were very important. With an export ratio of over 50% in many sectors, Austrian industry was very much export-oriented, and this would continue to be the basis of the country's prosperity. The crisis had to be used as an opportunity to undertake fundamental reforms, e.g. regarding the cost and organization of the country's education, healthcare and pension systems. In the short run, the important thing was to deal with the crisis efficiently. Wage policy should be adjusted so as to reflect the depth of the recession and correspond to the companies' (varying) productivity levels. Spare capacities should be used for research and infrastructure in the current situation. In the medium term, expansionary fiscal policy would have to be reversed again. Austria already was a high-tax country, so fiscal consolidation had to be achieved on the expenditure, not revenue, side.

Herbert Tumpel, President of the Austrian Federal Chamber of Labour, underlined that avoiding protectionism was not the only valid claim, and mentioned trade union freedom, the enforcement of labor standards and minimum ecological standards. According to Tumpel, free trade could only be fair and make sense if the same production conditions and requirements applied to all players. European policymakers were currently neglecting this issue. The measures taken at the European level to stimulate demand were insufficient. While the performance and export success of Austrian enterprises were important and commendable, export was not a stand-alone economic goal that should be given priority over domestic demand. There were massive imbalances in Europe, with the top export-

ing countries putting less competitive European countries under pressure. Tumpel strongly advocated tax coordination, as the contribution of rich people to tax revenues was shrinking, and reducing pensions was inacceptable. Policymakers had to focus on improving production conditions and on strengthening European demand. The demands made by industry for workers to accept a zero wage round this year and predictions of unemployment figures of 500,000 people did not help rebuild confidence, Tumpel said. While the bank support packages may well be in the interests of the entire economy, they also helped safeguard shareholders' assets. Crisis management had to consider social justice issues, the rich should also make a fair contribution to fiscal consolidation.

Central Banks Acted Quickly, Fiscal Policy Was Adequately Expansionary – Now Reform of Cross-Border Financial Supervision Is Required

The last speaker at the conference was *Dominique Strauss-Kahn, Managing Director of the IMF,* who focused on *"Crisis Management and Policy Coordination: Do We Need a New Global Framework?"* At the onset of the crisis, individual countries were not inclined to coordinate policies at the international level in dealing with the problems of cross-border financial conglomerates, which further destabilized the situation. As the crisis went on, however, a learning process set in, leading to more coordination. The support packages for Eastern Europe illustrated the advantages of international coordination. During this crisis (in contrast to the Great Depression of the 1930s), central banks worldwide were extremely generous in the provision of liquidity (sometimes relying on special measures), and they slashed key interest

rates fast and to historically low levels. Fiscal policy measures – implemented at more or less the same time, though without explicit coordination – provided the national economies with additional demand impulses.

The picture was less favorable with regard to financial market stabilization. This might be due to the unresolved question of how to divide up the budgetary costs of cross-border bank support packages. The lesson to be learned from the crisis was, first, that regulatory arbitrage was damaging and had to be avoided. Second, crisis resolution tools had to be better coordinated. There were many suggestions to choose from, and now was the time to act quickly. Economic history showed that recovery after financial crises was only possible after the deleveraging of banks' balance sheets. Provided this deleveraging took place, global economic recovery could be expected to occur in the first half of 2010 according to Strauss-Kahn. Third, depositor and investor protection systems had to be coordinated. Finally, information sharing between home and host country supervisors had to become quicker and more extensive. The Basel Committee and the Financial Stability Board at the BIS in Basel would play a leading role in this process; the IMF would also be involved, in particular in a monitoring capacity. It was, however, difficult in practice to implement economic policy measures in response to early warnings, i.e. before the actual outbreak of a crisis.

As a result of its strong international ties, Europe was vulnerable to the crisis, as these ties involved the risk of contagion. This was why the IMF viewed the emerging countries of Eastern Europe as one entity. Current crisis management worldwide was very impressive. The international community had become closer, and there was great willingness to cooperate. Global institutions, including the IMF, had helped stabilize the situation. While the crisis was not yet resolved, the way to overcoming it was relatively clear. At present, problems were increasingly originating in the real economy, which caused credit defaults. The massive fiscal stimulus in China would contribute to smoothing out the existing global imbalances, but further measures would be required in this field. The fiscal costs of overcoming the crisis were significant. After the crisis, fiscal consolidation would be necessary to avoid fiscal crises. Euro area countries were unlikely to need IMF aid, but other EU countries might well benefit from IMF programs. Strauss-Kahn reiterated that the IMF prescribed the implementation of fiscal consolidation measures in aid programs only if the countries involved did not have sustainable budgets before the crisis.

Klaus Liebscher Award Goes to Tarek Alexander Hassan and Anton Korinek

Like in previous years, the authors of two outstanding scientific papers received the Klaus Liebscher Award at the 37th Economics Conference. After an introduction by Claus J. Raidl, President of the OeNB, Governor Ewald Nowotny introduced the award winners. *Tarek Alexander Hassan of Harvard University* showed that securities issued by large countries yielded lower returns than those by small countries. *Anton Korinek of the University of Maryland* pointed out systematic distortions of risk allocation on financial markets and deduced consequences for capital adequacy regulations and for risk management. After a short presentation of the papers by the authors, Klaus Liebscher handed out the awards.

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
			IMF	International Monetary Fund
			ISO	International Organization for Standardization
			IWI	Industriewissenschaftliches Institut – Austrian Institute for Industrial Research, Vienna
ATX	Austrian Traded Index		JVI	Joint Vienna Institute
BCBS	Basel Committee on Banking Supervision (BIS)		LIBOR	London Interbank Offered Rate
BIC	Bank Identifier Code		M3	broad monetary aggregate M3
BIS	Bank for International Settlements		MFI	monetary financial institution
BOP	balance of payments		MRO	main refinancing operation
BSC	Banking Supervision Committee (ESCB)		MoU	memorandum of understanding
CACs	collective action clauses		NACE	Statistical Classification of Economic Activities in the European Community
CEBS	Committee of European Banking Supervisors (EU)			
CEE	Central and Eastern Europe		NCB	national central bank
CEEC(s)	Central and Eastern European country (countries)		OeBS	Oesterreichische Banknoten- und Sicherheitsdruck GmbH (Austrian banknote and security printing works)
CESEE	Central, Eastern and Southeastern Europe			
CESR	Committee of European Securities Regulators			
CIS	Commonwealth of Independent States		OECD	Organisation for Economic Co-operation and Development
CPI	consumer price index			
EBA	Euro Banking Association		OeKB	Oesterreichische Kontrollbank (Austria's main financial and information service provider for the export industry and the capital market)
EBRD	European Bank for Reconstruction and Development			
EC	European Community			
ECB	European Central Bank			
Ecofin	Economic and Financial Affairs Council (EU)		OeNB	Oesterreichische Nationalbank (Austria's central bank)
EEA	European Economic Area			
EFC	Economic and Financial Committee (EU)		OPEC	Organization of the Petroleum Exporting Countries
EIB	European Investment Bank		ÖBFA	Österreichische Bundesfinanzierungsagentur – Austrian Federal Financing Agency
EMS	European Monetary System			
EMU	Economic and Monetary Union			
EONIA	Euro OverNight Index Average		ÖNACE	Austrian Statistical Classification of Economic Activities
ERM II	exchange rate mechanism II (EU)			
ERP	European Recovery Program		POS	point of sale
ESA	European System of Accounts		PRGF	Poverty Reduction and Growth Facility (IMF)
ESAF	Enhanced Structural Adjustment Facility (IMF)		R&D	Research & Development
ESCB	European System of Central Banks		RTGS	Real-Time Gross Settlement
ESRI	Economic and Social Research Institute, Dublin		SDR	Special Drawing Right (IMF)
EU	European Union		SDRM	Sovereign Debt Restructuring Mechanism (IMF)
EURIBOR	Euro Interbank Offered Rate		SEPA	Single Euro Payments Area
Eurostat	Statistical Office of the European Communities		SPF	Survey of Professional Forecasters
FATF	Financial Action Task Force on Money Laundering		STEP2	Straight-Through Euro Processing system provided by the Euro Banking Association
FDI	foreign direct investment			
Fed	Federal Reserve System (U.S.A.)		STUZZA	Studiengesellschaft für Zusammenarbeit im Zahlungsverkehr G.m.b.H. – Austrian Society for Payment System Research and Cooperation
FMA	Austrian Financial Market Authority			
FOMC	Federal Open Market Committee (U.S.A.)			
FSAP	Financial Sector Assessment Program (IMF/World Bank)			
			S.W.I.F.T.	Society for Worldwide Interbank Financial Telecommunication
FWF	Fonds zur Förderung der wissenschaftlichen Forschung – Austrian Science Fund			
			TARGET	Trans-European Automated Real-time Gross settlement Express Transfer
GAB	General Arrangements to Borrow			
GATS	General Agreement on Trade in Services		Treaty	Treaty establishing the European Community
GDP	gross domestic product		UCIT(s)	undertaking(s) for collective investment in transferable securities
GNP	gross national product			
GSA	GELDSERVICE AUSTRIA Logistik für Wertgestionierung und Transportkoordination GmbH (Austrian cash logistics company)			
			ULC	unit labor cost
			UN	United Nations Organization
			UNCTAD	United Nations Conference on Trade and Development
HICP	Harmonised Index of Consumer Prices			
HIPC	Heavily Indebted Poor Countries		VaR	value at risk
HOAM.AT	Home Accounting Module Austria		WBI	Wiener Börse Index (all-share index of the Vienna stock exchange)
IBAN	International Bank Account Number			
IBRD	International Bank for Reconstruction and Development		WEF	World Economic Forum
			WIFO	Österreichisches Institut für Wirtschaftsforschung – Austrian Institute of Economic Research
ICT	information and communication technology			
IDB	Inter-American Development Bank		wiiw	Wiener Institut für internationale Wirtschaftsvergleiche – The Vienna Institute for International Economic Studies
IFES	Institut für empirische Sozialforschung GesmbH – Institute for Empirical Social Research, Vienna			
			WKÖ	Wirtschaftskammer Österreich – Austrian Federal Economic Chamber
Ifo	Ifo Institute for Economic Research, Munich			
			WTO	World Trade Organization

Legend

x   =   No data can be indicated for technical reasons

.. =   Data not available at the reporting date

0   =   The numerical value is zero or smaller than half of the unit indicated

Discrepancies may arise from rounding.

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

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The Focus on European Economic Integration (FEEI) is a channel for communicating the OeNB's ongoing research on Central, Eastern and Southeastern European (CESEE) countries, thus reflecting a strategic regional research priority of the OeNB. Contributions to the quarterly FEEI include peer reviewed studies dealing primarily with macrofinancial and monetary integration as well as economic country analyses and cross-regional comparisons.

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econ.newsletter   quarterly

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

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annual

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For further details see *http://ceec.oenb.at*

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Intellectual Capital Report

annual

The Intellectual Capital Report is a review of the OeNB's intellectual capital and its use in the OeNB's business processes and services. The report clarifies the relationships between different types of human, relational, structural and innovation capital and describes various determinants that influence the OeNB's intellectual capital. The report provides an integrated view of the OeNB and serves to assess the consistency of the OeNB's intellectual capital with its knowledge-based strategic orientation.

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