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THE WORLD BANK

ISSUE # 26
January 2013

EU11

REGULAR ECONOMIC REPORT

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MACROECONOMIC REPORT:

FALTERING RECOVERY

SPECIAL TOPIC:

THE ECONOMIC GROWTH IMPLICATIONS OF AN AGING EUROPEAN UNION

This Regular Economic Report (RER) is a semiannual publication of the Europe and Central Asia Region, Poverty Reduction and Economic Management Department (ECA PREM), The World Bank. It covers economic developments, prospects, and policies in 10 European Union (EU) member states— Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, the Slovak Republic, and Slovenia—and one forthcoming member, Croatia. Throughout the RER, for simplicity, we refer to this group of eleven countries as EU11.

The RER comprises two parts: a Macroeconomic Report, and a Special Topic on an issue of economic policy interest in EU11. The Macroeconomic Report is co-authored by Ewa Korczyc, Matia Laco, and Gallina A Vincelette (team lead), with inputs from: Simon Davies, Stella Ilieva, Sanja Madzarevic-Sujster, Catalin Pauna, Emilia Skrok, Dilek Aykut, Elke Loichinger, Tea Trumbic, and Ilias Skamnelos. The Special Topic of this issue "The Economic Growth Implication of an Aging European Union" is coauthored by Jesus Crespo Cuaresma, Elke Loichinger, and Gallina A Vincelette.

The team is grateful to Satu Kahkonen (Sector Manager, Europe and Central Asia Region, Poverty Reduction and Economic Management), Yvonne M. Tsikata (Director, Europe and Central Asia Region, Poverty Reduction and Economic Management), and Peter C. Harrold (former Country Director, Central Europe and the Baltic States) for their guidance in the preparation of this report. The team is thankful for comments on earlier drafts of this report received from colleagues from the World Bank, the International Monetary Fund, the European Commission, and Central Banks and Ministries of Finance in EU11 countries.

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Macroeconomic Report:

Faltering Recovery

SUMMARY

In 2012, the EU11[1] economies have once again outperformed the ones in the rest of the European Union (EU). In the middle of a recession in the Euro area, the EU11 region is set to expand by about 1 percent in 2012, albeit at a significantly slower pace than in 2011.

The modest growth in the EU11 was supported by a number of factors. First, the ability of the EU11 to diversify markets and increase the share of exports to non-EU markets helped spur favorable trade results. Second, net FDI flows remained stable, keeping the EU11 among the attractive destinations to invest. Third, the EU11 governments diligently proceeded with fiscal consolidation in 2012, which helped contain the increases in public debt-to-GDP ratios. Despite macroeconomic concerns and tight budget envelopes, most EU11 governments delivered their ambitious public investment programs in support of economic growth. Fourth, monetary policies remained accommodative throughout the EU11. Fifth, EU11 financial sector confidence has started to show gains, supported by the continuous efforts of EU11 domestic regulators to safeguard the stability of the financial system. Domestic conditions in the EU11, as well as the somewhat calm financial markets (after the European Central Bank measures to defend the Euro, and the German Constitutional Court's favorable ruling on the European Stability Mechanism), made EU11 countries beneficiaries of the decline in the price of risk in 2012. The EU11 countries accessed financial markets in the second half of 2012 at record low prices.

However, the recession in the Euro area continues to dampen the EU11 economic performance. With the downward trend in economic activity, EU11 labor markets remained slack. Unemployment rates hovered around those recorded in the midst of the global financial crisis, with sluggish employment growth and long-term unemployment on the rise. Rising global food prices put pressure on some EU11 countries' efforts to anchor inflation over the second and third quarter of 2012, but have subsided since then. In addition, credit growth remained at below pre-crisis levels amid slowing economic activity in the EU11. The legacy of nonperforming loans (NPLs) was yet another factor contributing to the low credit growth in the EU11. Growing NPLs still burden some EU11 countries, despite loan resolution efforts and tight regulatory requirements.

In a volatile external environment, economic growth in the EU11 is expected to increase modestly from below 1 percent in 2012 to 1.3 percent in 2013. However, in a situation of heightened uncertainty, even this modest growth assumes that policies adopted in the Euro area will be implemented successfully to avoid severe deterioration in international financial market conditions. The near-term labor market outlook remains unfavorable with unemployment decelerating only in the medium term. Gains in non-EU markets will likely be sustained, even though EU11 trade flows in the EU will remain subdued with the Euro area expected to remain in recession in 2013. Net foreign direct investment (FDI) flows to EU11 will likely accelerate and the EU11 should continue to remain an attractive FDI destination, especially if progress in improving the business environment continues. Deliberate exchange rate flexibility

[1] EU11 refers to the 10 European Union (EU) member states—Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, the Slovak Republic, and Slovenia—and one forthcoming member, Croatia. Throughout this Regular Economic Report (RER), for simplicity, this group of eleven countries is referred to as EU11. The group of EU15 countries comprises: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom.

and accommodative monetary policies in some EU11 countries are likely to continue to help the economies respond to the Euro area volatility. The EU11 governments are planning to pursue gradual fiscal consolidation in the near term. But in light of weak growth, the fiscal improvement will come chiefly from correction in structural balances.

With an uncertain economic outlook in the medium term, the EU11 need to pursue decisive economic policies on two fronts to safeguard and accelerate their growth momentum. First, a prudent macro-policy stance should continue to shore up the confidence of financial markets. Second, the medium-term economic growth potential of the EU11 can only be realized if structural barriers to economic activity are removed. Removing barriers to growth in product and labor markets and closing the existing institutional gaps with the rest of the EU will soften the constraints imposed by demographic threats and produce sizable returns in income convergence with the EU15. Providing incentives for labor mobility, making public finances more sustainable, adapting social security systems to demographic developments, and harmonizing regulations across borders are key reform priorities for the EU11.

Economic Growth Rates, 2011-2013

	2011	2012	2013
EU11	**3.1**	**0.9**	**1.3**
Bulgaria	1.7	0.8	1.8
Czech Republic	1.9	-1.3	0.8
Estonia	8.3	2.5	3.2
Latvia	5.5	5.3	3.0
Lithuania	5.9	3.3	2.5
Hungary	1.7	-1.5	0.4
Poland	4.3	2.2	1.5
Romania	2.5	0.6	1.6
Slovenia	0.6	-2.3	-1.6
Slovak Republic	3.2	2.5	1.6
Croatia	0.0	-1.8	0.8
Memo			
Euro area	**1.5**	**-0.4**	**-0.1**

Source: World Bank staff calculations.

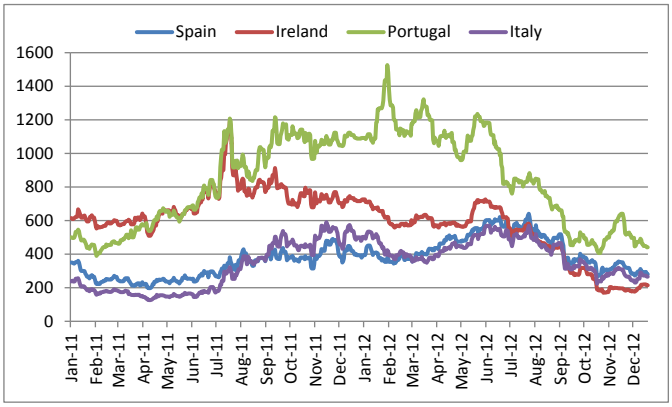
Global Trends

Anemic Global Growth Suppressed by Euro area Uncertainty

The global economy showed anemic signs of growth in 2012 and is expected to keep the pace in 2013. The recession in the Euro area remains the main drag on the global recovery as the currency union's economic performance continues to suffer from the ongoing debt crisis and fiscal austerity. An economic rebound in Europe would require that countries adhere to their commitments to resolving macroeconomic imbalances, supported by substantial coordination of economic policy within the European Union. In addition, high food prices and fiscal challenges the United States (US) pose downward risks to the near-term global outlook.

Financial markets conditions have improved markedly in the second half of 2012. Following a highly volatile second quarter of 2012, global financial market tensions eased in the summer following the European Central Bank (ECB) measures to defend the Euro. With the actual launch of ECB's bond-buying program and the German Constitutional Court's favorable ruling on the European Stability Mechanism (ESM) in September, the risk of an acute Euro area break up has subsided. Borrowing costs for high-spread countries such as Ireland, Italy and Spain have declined (Figure 1). Emerging markets bond spreads (EMBIG) have also declined by 80 basis points (bps) and are well below their long-term average levels (around 310 bps) since mid-2012. Global equity markets rebounded, with stocks in high-income countries up by 12.7 percent in 2012 and in developing countries by 13.9 percent.

Figure 1. Credit Default Spreads (CDS) Spreads in Europe (Percent)



Source: Bloomberg; World Bank staff calculations.

The global economy shows anemic signs of growth, but outside of Europe. After months of decelerating economic activity following the May-June 2012 financial market turbulence, the global economy is slowly recovering in the second half of 2012. Global industrial production was on the rise at a seasonally adjusted annualized pace of 0.4 percent during the three months ending September 2012. In addition to an already visible strengthening of activity in the developing countries, the US economy appears to be recovering slowly—in part due to a pickup in the housing sector and the labor market. Overall, the global recovery is expected to have firmed up somewhat in the fourth quarter of 2012, even as ongoing fiscal consolidation, high unemployment, and very weak

consumer and business confidence continued to weigh on activity in the Euro area. Global growth is likely to be at around 2.3 percent in 2012 and further accelerate to 2.4 in 2013.

However, the Euro area recession will negatively affect the global recovery for as long as the currency union's economic performance continues to suffer from the ongoing debt crisis and fiscal austerity. Economic conditions in the Euro area have continuously deteriorated since the second half of 2011. While the Euro area escaped recession in the first quarter of 2012, mainly thanks to the performance of the German economy, the two consecutive quarterly GDP declines in the second and third quarter of 2012 imply that the Euro area has fallen again into a recession. Positive quarterly GDP increases in the third quarter in Germany and France were insufficient to offset the declines in Spain, Italy, the Netherlands, Portugal, and Greece. As a whole, the Euro area GDP was expected to contract by around 0.4 percent in 2012. The Euro area economy will likely remain in recession in 2013 and rebound only in the medium term. While Germany's economic activity is likely to grow in 2013 at a rate of less than 1 percent, its pace will be far slower than in 2012. The economic performance of the Scandinavian countries, Austria, and Italy will remain subdued.

This report assumes a modest global recovery in the near term. The likely scenario for Europe remains one where tensions continue to gradually ease as new institutional arrangements and remedies are found. However, the economic rebound in Europe will require that countries adhere to their commitments to resolve macroeconomic imbalances, supported by substantial coordination of economic policy within the EU. In the baseline scenario for this report, the fiscal challenges implied by the current legislation in the US are assumed to be avoided. It is assumed that the developing countries will keep the current pace of growth in the near term.

There are significant downside risks that will tamp down global growth:

i. **Uncertainties** related to the implementation of announced policy measures in the Euro area present a notable threat to the global economic recovery.
ii. **US fiscal challenges** have begun to take center stage. While the January 1st 2013 legislation resolved some points of contention, major issues on the public spending side remain unresolved. A new end-of-February 2013 deadline looms when sequestered spending and the debt-ceiling provisions will kick in, unless the US authorities intervene once again.
iii. **Accelerating food prices** present another headwind for economic prospects. Wheat and maize prices gained about 40 percent earlier in the summer following poor crop conditions in the US and Europe. While there are no serious supply shortages at the moment, the high prices may have important budgetary and monetary policy implications.

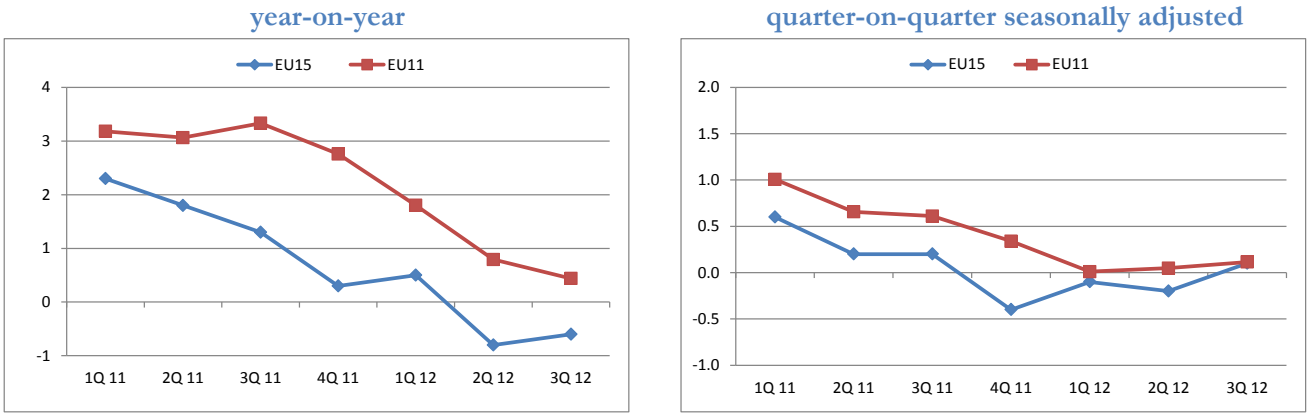
Recent Developments in the EU11

Economic Growth in 2012 is Slowing Down Amidst High External Volatility

The EU11 economies are gradually slowing down under the pressures coming from the external environment. The economic growth in 2012 is now expected to be weaker by around 0.6 percentage points than the summer 2012 expectations. The modest economic growth stemmed from the growth of net exports, while domestic demand subsided.

Against the backdrop of a difficult external environment, growth in the EU11 is slowing down. In the first three quarters of 2012, faltering confidence in the global recovery and recurrent stress in the Euro area translated into a slowdown of economic activity in the region. EU11 year-on-year growth rates slowed by more than three times from 3.1 percent in 2011 to around 1 percent in the first three quarters of 2012. On a quarterly basis, economic growth in the EU11 has been on a downward path since early 2011 and stabilized only in the second quarter 2012. The modest increase in the growth in the third quarter of 2012 suggests that economic activity will remain subdued until the end of 2012 (Figure 2). While the latest data regarding the EU15 point to continuous recession in the third quarter, the GDP growth leveled off somewhat.

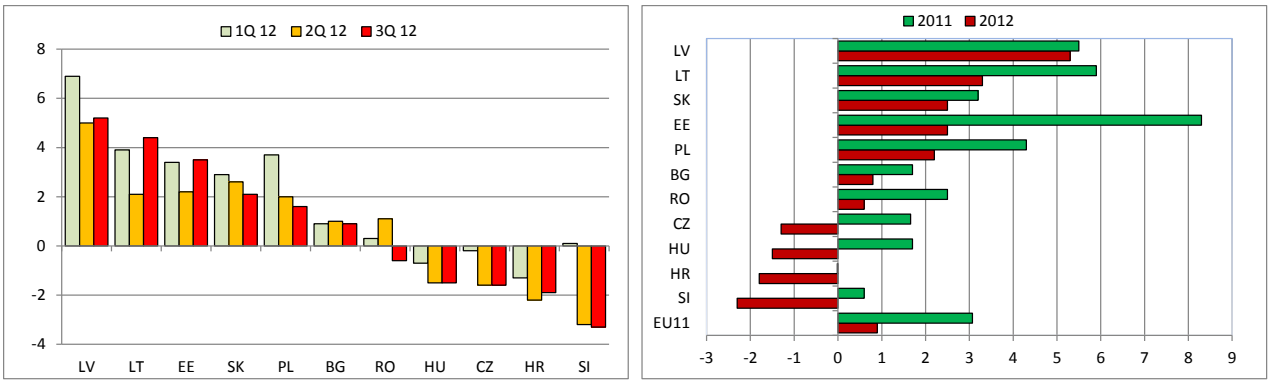
Figure 2. GDP Growth in EU11 and EU15, 1st Quarter 2011 to 3rd Quarter 2012 (Percent)



Source: Eurostat, World Bank staff calculations.

All EU11 countries experienced slower growth in 2012 than in 2011. Data for the first three quarters of 2012, as well as recent estimates for the year, pointed to a weaker economic performance across the EU11 countries (Figure 3). So far, the biggest adjustments in growth were recorded in Estonia, Lithuania, Hungary, and the Czech Republic. In the case of both Estonia and Lithuania, the deterioration in growth performance can be attributed to the high base effect resulting from the impressive growth in 2011. The economic performance of Hungary and the Czech Republic worsened as both countries entered into recession in 2012. The Hungarian and the Czech economies continued to be affected by weak domestic demand—contracting private consumption and investment. In addition, strong deleveraging and fiscal adjustment weighted on economic growth in Hungary, while households tapped into savings to smooth their consumption expenditures. Slovenia and Croatia are the other EU11 countries with negative growth rates in 2012 due to significant declines in investment activity and consumption. Slovenia's year-on-year decline in gross fixed capital formation after three quarters in 2012 was close to 10 percent.

Figure 3. Growth in EU11 Countries (Percent, year-on-year)

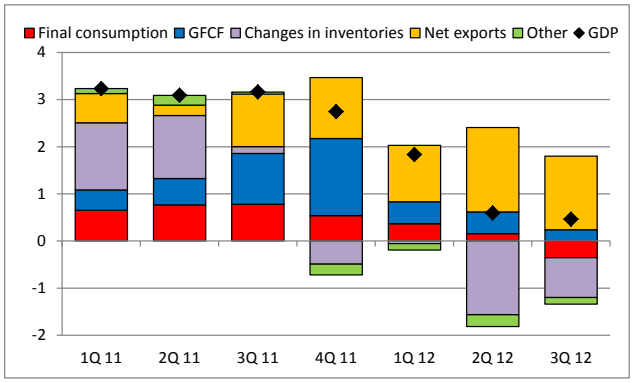


Source: Eurostat, World Bank staff calculations.

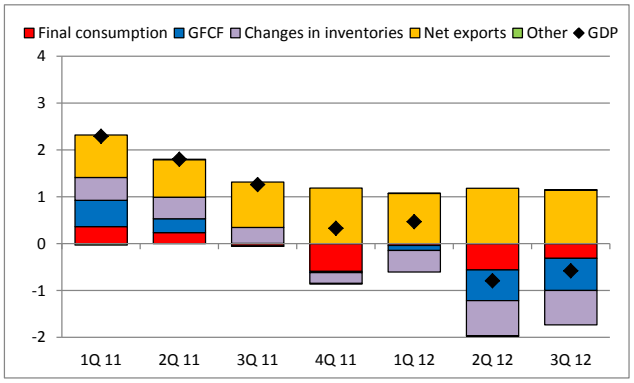
Since the second half of 2011, net exports have become an engine of growth for the EU11. Strong manufacturing performance in 2011 and in the first quarter of 2012 reflected increased demand for EU11 exports. In addition, moderate growth in domestic consumption—even a decline in the third quarter of 2012—as well as uncertain prospects concerning the macroeconomic situation of the region, put imports on hold. As a result, net exports were the main factor supporting economic growth in the region in the first three quarters of 2012 (Figure 4). The contribution of investment to GDP growth was significantly smaller than in 2011, as uncertainty about the near-term growth prospects, tight credit conditions, and completion of big infrastructure projects in some EU11 countries weighed down on investment activity, especially in the private sector. Public sector investment was also subdued on the back of continued fiscal consolidation efforts.

Figure 4. Contributors to GDP Growth, EU11 and EU15 (Percent)

EU11



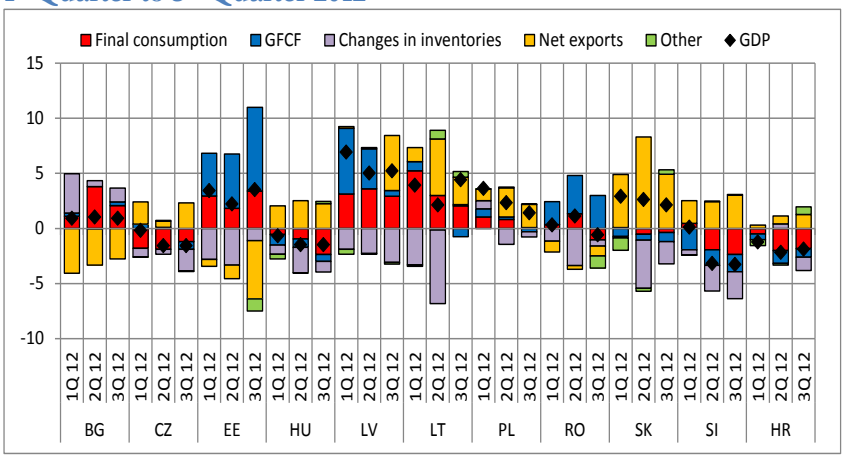
EU15



Source: Eurostat; World Bank staff calculations.
Note: 'Other' refers to statistical discrepancy.

The regional growth pattern for the EU11 concealed large country differences. Exports were the only driver of growth in the Czech Republic, Hungary, and Slovakia for most of 2012 (Figure 5). In all of these countries, the strong export performance was almost entirely driven by positive developments in the automotive industry. In Slovenia, net exports increased as imports contracted faster than exports. Zloty depreciation of late 2011 had a continued impact on the relatively robust performance of exports in Poland and, at the same time, limited demand for imports. With a weak domestic demand in the third quarter of 2012, Poland joined the countries where net exports solely drove economic growth. Domestic demand supported growth in the Baltic countries and Bulgaria. In Latvia, private consumption increased on the back of positive labor market developments and lower debt service costs for households. In Estonia, improved domestic demand stemmed from a very strong investment activity, especially from the public sector. Similarly, in Bulgaria, strong domestic demand became the engine of growth as private consumption recovered and investment activity appeared to stabilize, supported mainly by the public sector.

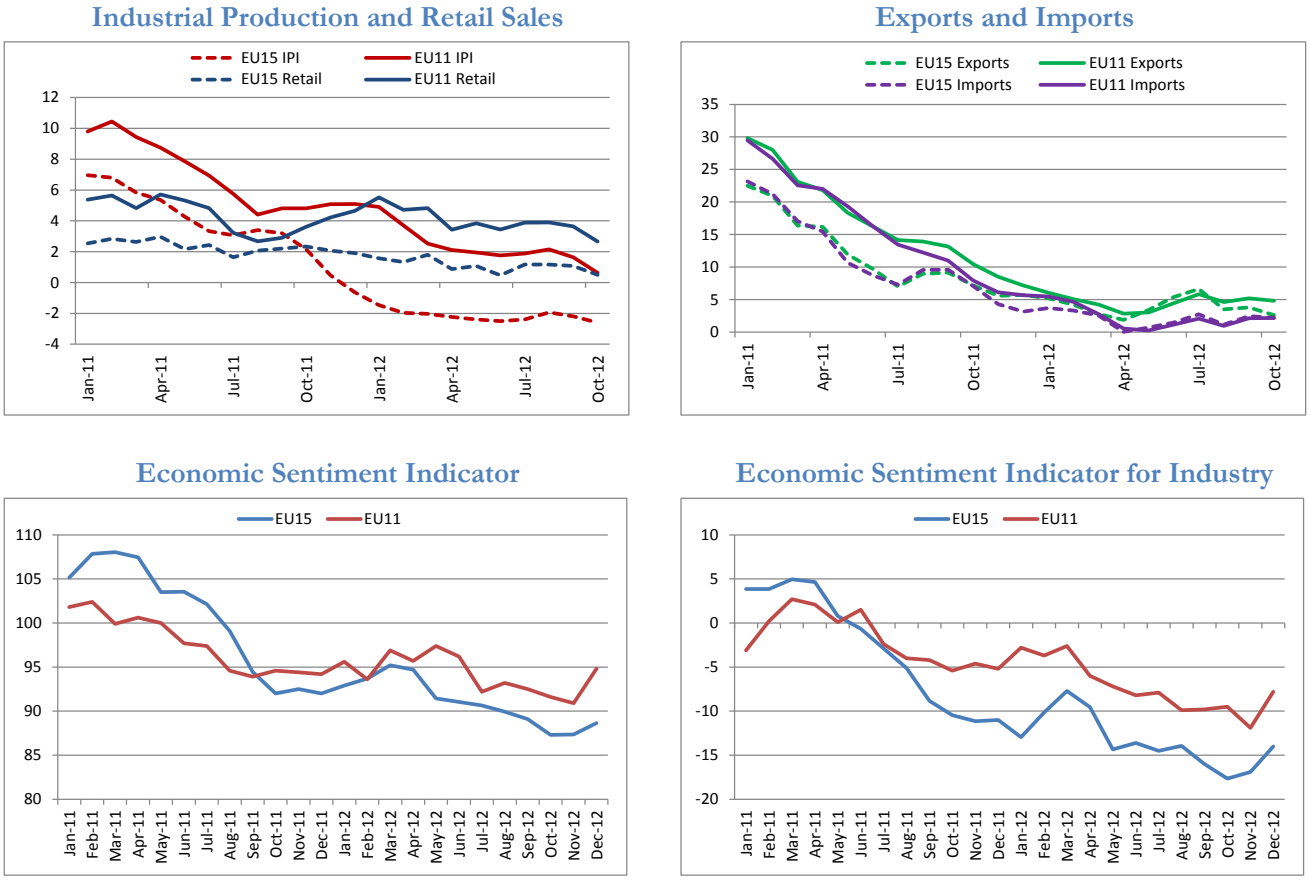
Figure 5. Contributors to GDP Growth, EU11 Countries 1st Quarter to 3rd Quarter 2012



Source: Eurostat; World Bank staff calculations.

Declining domestic demand in the EU11 and uncertain growth prospects in Europe are likely to result in further moderation in economic activity towards the end of 2012. Short-term high frequency indicators on retail sales, industrial production, as well as exports and imports performance seem to confirm that a further slowdown is under way (Figure 6). In addition, recent PMI readings are still below key 50-point mark and the European Commission (EC) sentiment indicators remain depressed, even though December data showed some improvement in the economic sentiment both for consumers and industry.

Figure 6. High-Frequency Indicators, EU11 and EU15 (Percent)



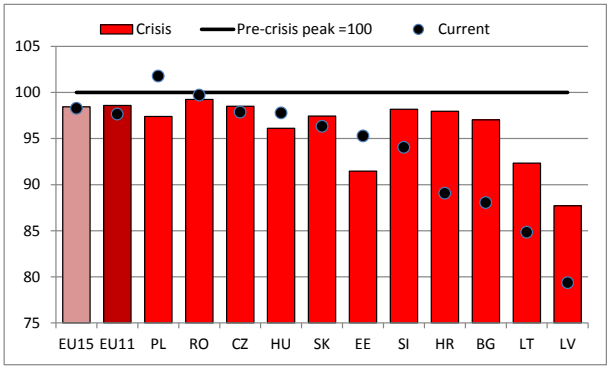
Source: Eurostat, European Commission, World Bank staff calculations.

PERSISTENTLY HIGH UNEMPLOYMENT

While total employment increased in the EU11 in the first half of 2012, it failed to reach its pre-crisis levels. The trend reversed in the third quarter when the region experienced declines in aggregate employment along with deceleration in economic activity. Unemployment rates did not increase significantly during the first ten months of 2012 but remained at a stubbornly high level. In addition, the share of long-term unemployment in total unemployment went up. At the same time, real wages continued to grow slower than productivity.

While employment creation in the EU11 showed weak signs of recovery in the first three quarters of the year, it remained at below pre-crisis levels. Employment levels in both EU11 and EU15 remained below the pre-crisis peak and very similar to the levels recorded during the global financial crisis in 2009/10 (Figure 7). Poland was the only country in the region with employment level above the pre-crisis peak. This is a result of Poland's good economic performance in the past four years. Since the global financial crisis, Estonia marked the largest relative increase in employment, albeit from the second (after Latvia) most severe decline in employment between 2007 and 2010. At the end of 2012, Estonia remained still some 5 percent below its pre-crisis employment levels. Employment levels in Bulgaria, Croatia and Slovenia remained below the lowest levels recorded in 2009/10: in Slovenia and Croatia this reflected a protracted recession, while in Bulgaria, on top of weak economic performance, which was unable to generate jobs, this also reflected a strong decline in the labor force on the back of negative demographic trends.

Figure 7: Employment Levels in EU11 and EU15 in 3Q 2012, pre-crisis peak=100, (Percent)



Source: Eurostat; World Bank staff.
Note: 'Pre-crisis' peak is the maximum employment level between 2006 and 2008; 'crisis' is the lowest employment level between 2009 and 2010; 'current' refers to 3rd Quarter 2012, 4-quarter moving average.

Along with the slowing economic growth in the EU11, the employment dynamics turned negative in the third quarter of 2012. After a fairly good first half of 2012 when employment increased by around 0.5 percent, the EU11 region recorded declines in aggregate employment in the third quarter of the year (Figure 8). Further decline is expected to follow in the fourth quarter as well. The negative employment growth in the region was mainly due to the weakening performance of the Polish labor market, where employment dropped by some 3.5 percent, following more than two years of continuous growth. The downward trend in employment dynamics persisted in Bulgaria, Slovenia and Croatia, where negative employment growth was recorded in every quarter since mid-2009. Only in the Baltic countries did employment increase, although the employment levels in 2012 in these countries remained some 8 to 10 percentage points below pre-crisis levels (Figure 9). Strong economic performance was behind the boost in employment in the Baltic countries.

Figure 8. GDP and Employment Growth in EU11 and EU15, Year-on-Year (Percent)

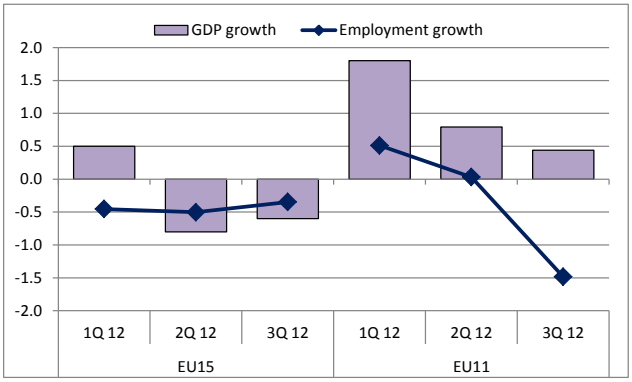
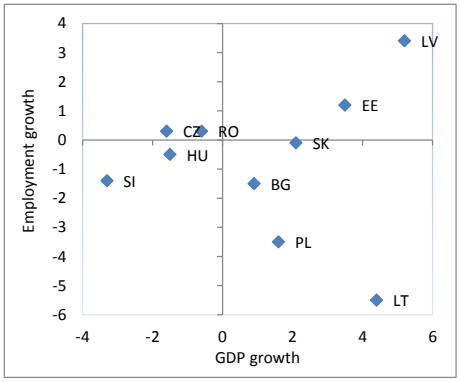


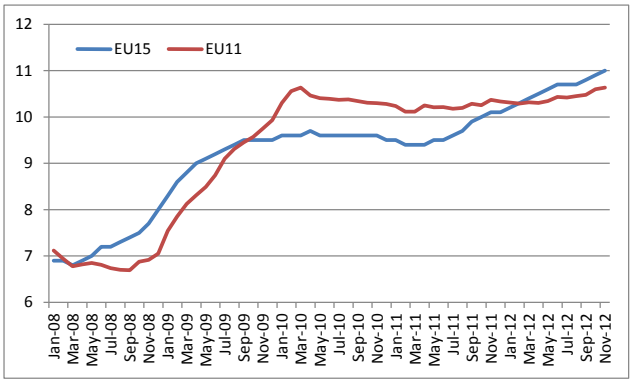
Figure 9. GDP and Employment Growth in EU11 Countries in 3rd Quarter 2012, Year-on-Year (Percent)

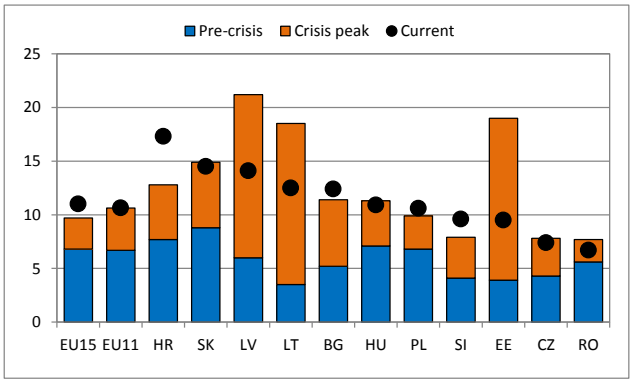


Source: Eurostat; World Bank staff

Unemployment remained at persistently high levels in the EU11 in 2012. While unemployment rates remained lower in the EU11 than in the EU15, by the end of November 2012 there were about 5 million unemployed in the EU11. The unemployment rate in the EU11 remained at slightly over 10 percent for the first eleven months of 2012, roughly at the crisis peak levels. In the Baltic States, as well as in Bulgaria, the current unemployment level is still more than double the rate before the crisis. Slovenia, Bulgaria and Croatia are the only countries in the EU11 region where the current unemployment rate is visibly above the levels recorded during the peak of the economic crisis in 2009/10. Poor labor market outcomes in Croatia and Slovenia stemmed from the on-going recession. In the case of Bulgaria, employers adjusted to lower demand by cutting labor while keeping wages increasing, also due to minimum wage increases. The other nine EU11 countries saw stagnation or even a decrease in unemployment levels since the peak of the crisis. The most pronounced declines in unemployment have taken place in Estonia, Lithuania and Latvia, supported by strong economic rebound.

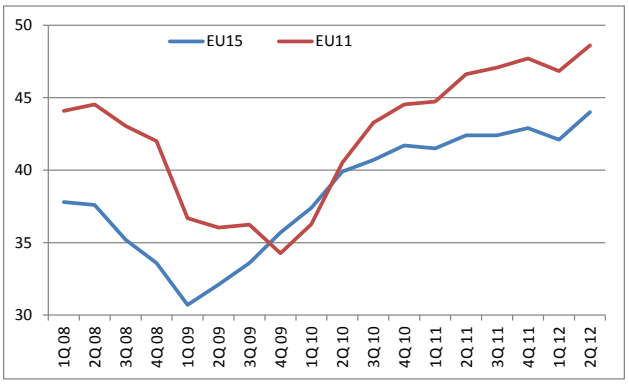
Figure 10. Unemployment Rates, EU11 and EU15 (Percent)





Source: Eurostat; Monthly unemployment based on EU LFS, seasonally adjusted; own aggregation.
Note: 'Pre-crisis' refers to the lowest monthly unemployment rate in 2007/08; 'crisis peak' refers to the highest monthly unemployment rate in 2009/10; 'current' refers to November 2012.

Figure 11. Long-Term Unemployment as Share of Total Unemployment, EU11 and EU15



Source: Eurostat; World Bank staff

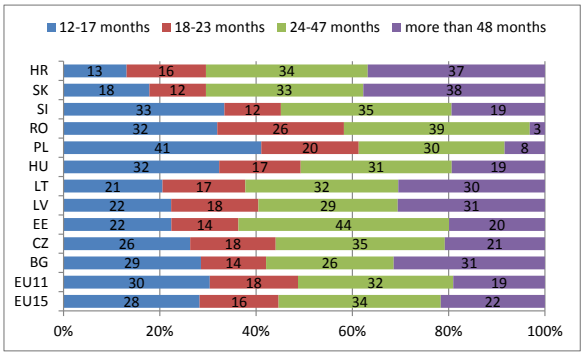
Long-term unemployment in the EU11 further increased in 2012. Long-term unemployment (defined as unemployment that lasts longer than 12 months as a share of all unemployment) in the EU11 has continued to rise since the end of 2009. The share of the long-term unemployed climbed to nearly 50 percent in the EU11 in 2012 (from 44 percent before the crisis) and since mid-2010 has remained consistently higher than in the EU15 (Figure 11). The recent hike in long-term unemployment stemmed from weakening economic activity in 2012 and from a slowdown in employment creation. In the second quarter of 2012, the share of long-term unemployed among the unemployed remained at very high levels: the largest in Slovakia and Croatia with well above 60 percent, and the lowest in Poland at about 40 percent.

Box 1. Long-Term Unemployment in the EU11 Countries: Who is Most Affected?

Long-term unemployment (LTU) in the EU11 has been on the rise since the global financial crisis in 2009/10 and has increased even more sharply in the second quarter of 2012 on the back of a deteriorating economic situation. As economic prospects are set to improve only in the medium-term, the trend of incresing LTU is likely to continue. In this Box, we identify groups according to age and gender who are most affected by the increased LTU in EU11.

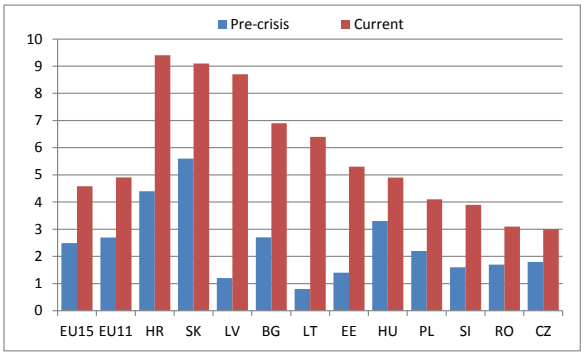
LTU in EU11: In the second quarter of 2012, 2.4 million people in the EU11 countries were long-term unemployed—including 700,000 who had been unemployed for 12 to 17 months, 420,000 for 18 to 23 months, 745,000 for 24 to 47 months, and 440,000 for more than 48 months. Since late 2007, LTU rates increased across the region. The most affected were countries that either experienced the most severe declines in economic activity (the LTU rate increased close to eight-fold in Latvia and Lithuania, and more than tripled in Estonia) or where the economic deterioration had been the most persistant (Croatia and Slovenia).

Figure 12. Long-Term Unemployment by Duration in 2nd Quarter 2012, (Percent)



Source: Eurostat; World Bank staff

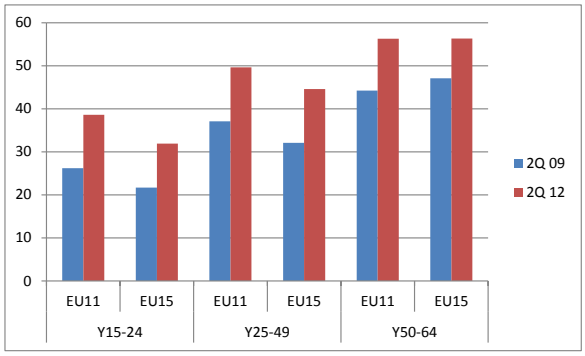
Figure 13. Long-Term Unemployment Rates in the Pre-Crisis Period and Currently, (Percent)



Source: Eurostat; World Bank staff

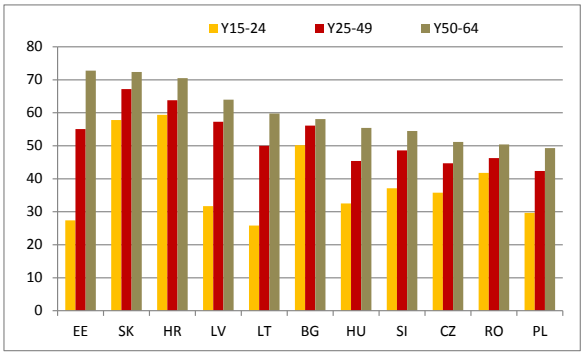
LTU by age: While LTU increased substantially in the past few years, the age structure has remained broadly unchanged. The majority of the unemployed aged 50–64 had been jobless for more than a year, compared to about 50 percent of the unemployed in the 'core' 25–49 age group. Among the young job seekers, long-term unemployed are around 40 percent. The aggregate picture conceals many cross country differences, especially regarding long-term unemployment among the youth. While in the Baltic countries the youth long-term unemployment is fairly limited, it is very high in Slovakia and Croatia where more than 50 percent of unemployed youth have been looking for jobs for more than one year.

Figure 14. Long-Term Unemployment by Age as Percent of Total Unemployment



Source: Eurostat; World Bank staff.

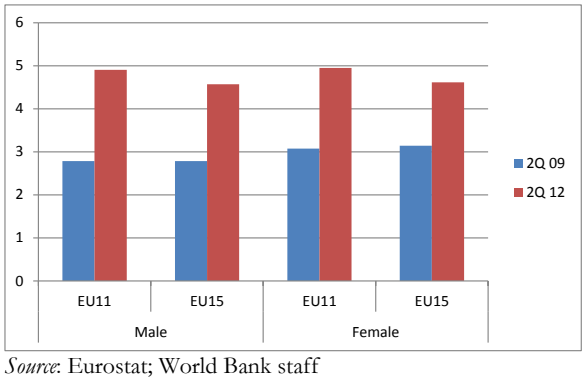
Figure 15. Long-Term Unemployment by Age as Percent of Total Unemployment, 2nd Quarter 2012



Source: Eurostat; World Bank staff.

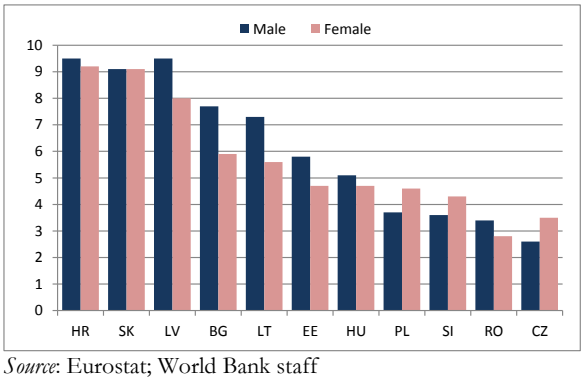
LTU by gender: At the aggregate level, it seems that the economic crisis of 2009/10 did not have gender differenciated impact on LTU rates in EU11. In the case of both men and women, the aggregate LTU rates increased substantially to close to 5 percent of the active population, from less than 3 percent back in early 2009. At an individual country level, it seems that in the second quarter of 2012 in many EU11 countries, LTU rates of males were higher than those for females. This is particulary visible in the Baltic countries and Bulgaria, which experienced large adjustments in the labor market, especially among male-dominated sectors like construction and manufacturing.

Figure 16. Long-Term Unemployed as Percent of Active Population by Gender



Source: Eurostat; World Bank staff

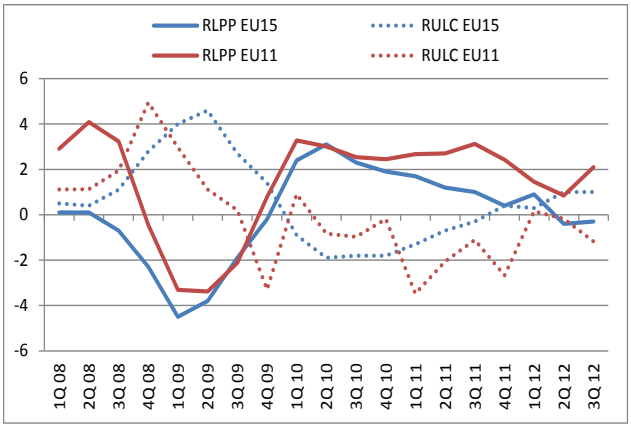
Figure 17. Long-Term Unemployed as Percent of Active Population by Gender



Source: Eurostat; World Bank staff

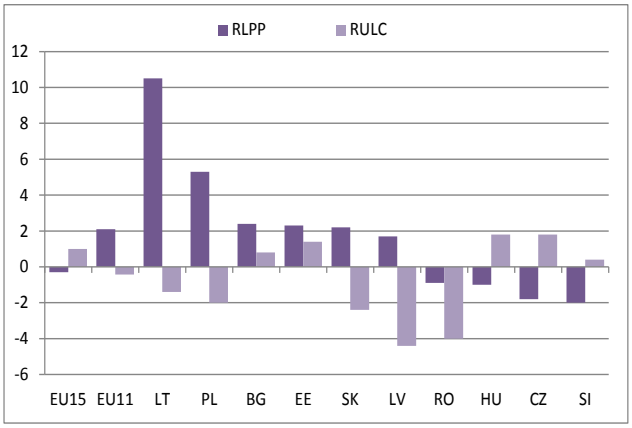
Labor productivity growth continued to be higher in the EU11 than in the EU15 in 2012. Since late 2009, growth in productivity was higher than growth in unit labor costs in the EU11 countries, thereby strengthening the competitiveness of the region (Figure 18). EU15 countries recorded similar pattern up to early 2012, however since than real unit labor costs outpaced the growth in real productivity. Year-on-year changes in the third quarter of 2012 showed declining labor costs and increasing labor productivity in the EU11 (Figure 19).

Figure 18. Real Labor Productivity Per Person Employed and Real Unit Labor Costs, EU11 and EU15, Year-on-Year, Not Seasonally Adjusted (Percent)



Source: Eurostat; World Bank staff
Note: EU11 without Romania and Croatia; EU15 after 1st Quarter 2011, without Greece.

Figure 19. Growth in Real Labor Productivity and Real Unit Labor Costs in 3rd Quarter of 2012, Year-on-Year, Not Seasonally Adjusted (Percent)



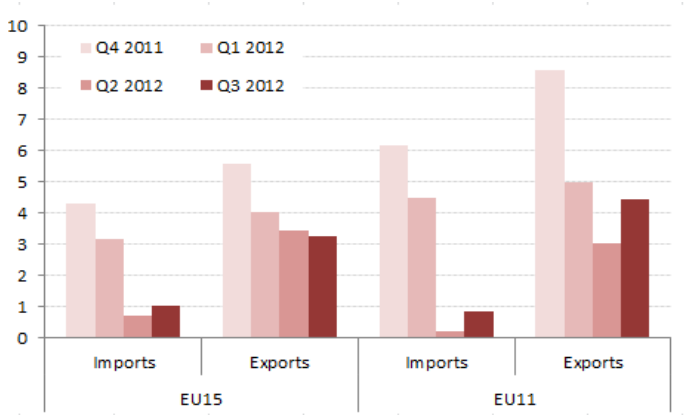
Source: Eurostat; World Bank staff

SUBDUED INTERNATIONAL TRADE, BUT STABLE FDI

Both exports and imports in the EU11 picked-up in the summer months of 2012, after a very weak second quarter, with exports growing stronger than imports. After poor performance at the end of the third quarter, positive movements are again recorded by the beginning of the last quarter of 2012. Throughout the year, exports towards the markets of non-EU countries helped spur favorable trade results and compensated partially for the weak import demand from the Euro area. Current account balances improved in the EU11 as trade and income balances continued to narrow. Net FDI flows to the EU11 remained stable on the back of intercompany lending. The EU11 gross external debts modestly increased due to sovereign borrowing.

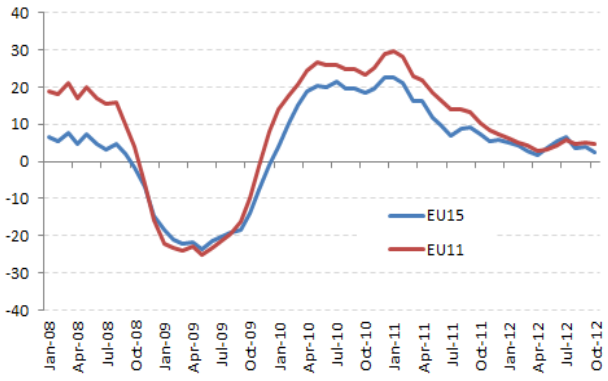
After a temporary rebound in the summer months of 2012, EU11 international trade slowed down towards the end of the year. Exports from the EU11 increased by 4.5 percent in the third quarter of 2012, while imports picked up by only 0.8 percent (Figure 20). However, weak September 2012 data showed a contraction of imports and almost flat exports were again reversed in. Exports from the EU11 increased by 9.4 percent in September; this marked the highest growth rate of exports in 2012. After contracting in September, imports surged by 7.0 percent. Overall, exports still grew faster than imports in 2012, but at a significantly reduced pace than in 2011. In the first ten months of 2012, exports contracted only in Romania, while the annual change of imports was negative only in Slovenia and Croatia.

Figure 20. Annual Growth Rates of Trade, (Percent)



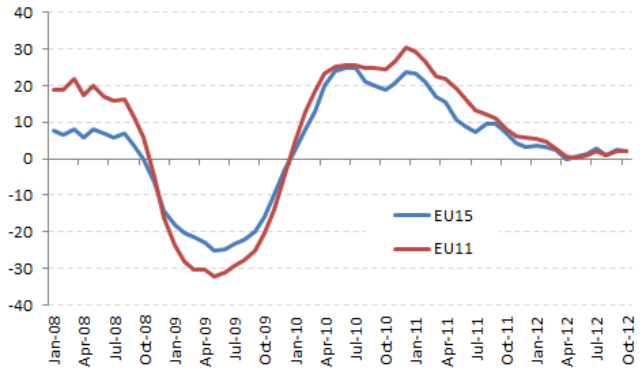
Source: Eurostat; World Bank staff calculations.

Figure 21. Growth in Goods Exports (Percent, Year-on-Year, 3-Month Moving Average)



Source: Eurostat; World Bank staff calculations

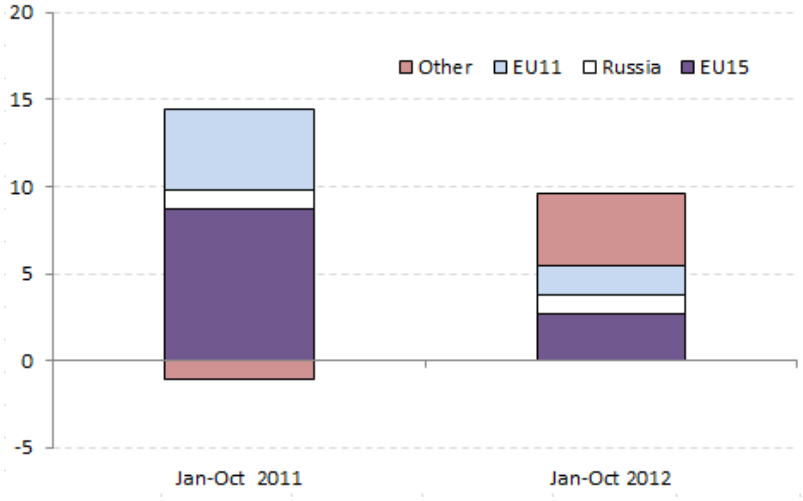
Figure 22. Growth in Goods Imports (Percent, Year-on-Year, 3-Month Moving Average)



Across the EU11, the performance of merchandise exports varied considerably. Supported by a rebound in manufacturing, exports grew substantially in Slovakia. Sizeable improvements of exports in Slovakia were driven mainly by exports of transport equipment (passenger cars) and machinery. In particular, the annual growth rate of the Slovak automotive industry exports increased to more than 33 percent in the second quarter (from around 11 percent in the first quarter) despite weakening external demand. Relying on improved competitiveness during the crisis years, Lithuania, Latvia and Estonia have succeeded in maintaining a relatively better position vis-á-vis their competitors; hence the bulky volume of manufacturing exports. Lithuania, Latvia, and Slovakia were the only countries in the region where exports grew by double-digits. By end of the third quarter 2012, exports turned negative in Romania, Slovenia, Hungary, and the Czech Republic as a result of these countries' poor economic performance and subdued demand from their main trading partners. Exports remained sluggish in Croatia as well, as the restructuring of the most important export branches (shipbuilding and petrochemicals) led to a decline in goods exports. The beginning of the fourth quarter 2012 showed favorable movements, with exports growing throughout the region.

The redirection of merchandise exports to markets outside the EU was beneficial for most EU11 countries. Exports to non-EU countries picked up in Bulgaria, the Czech Republic, Slovenia, and Poland, especially in the third quarter of 2012. As the EU demand for imports declined and Russia accessed the World Trade Organization (WTO), Russia's role as a trade partner increased. Other significant non-EU trading partners include Turkey, the US and China, but also other countries outside EU27 (Figure 23).

Figure 23. Overall Growth Rate and Geographical Structure of EU11 Exports



Source: Eurostat; World Bank staff calculations.

Cumulative current account balances improved in the EU11 as trade and income balances continued to narrow (Figure 24). The Czech Republic and Slovakia saw substantial improvements in their trade balances as well as narrowing of their income balance. In the Czech Republic, current account deficit improved by almost 2 percentage points of GDP on the back of lower payments of dividends to foreign owners of domestic direct investments and an improvement in the compensation of employees. However, current accounts deteriorated slightly in Estonia, Bulgaria, Lithuania, and Latvia, reflecting a high gap in the trade balance (Latvia, Bulgaria and Estonia) and

the payments of yields on domestic bonds and current transfer payments (Lithuania) (Figure 24, Figure 25).

Figure 24. Cumulative Current Account Composition (Percent of GDP)

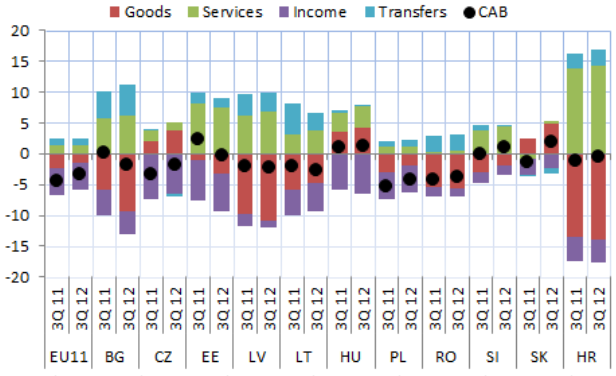
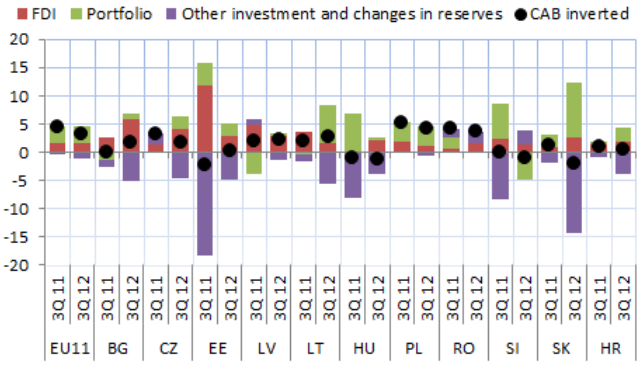


Figure 25. Cumulative Financial Account Composition (Percent of GDP)



Source: Eurostat; World Bank staff calculations.

While FDI net flows to the EU11 remained stable during the past two years, their composition shifted from equity capital towards intercompany lending in 2012. For the EU11 region as a whole, reinvested earnings remained relatively unchanged. After a weak first quarter of equity investment, demand among foreign investors for investment rebounded in the second quarter of 2012, but remained below the trend of recent years. Poland, Slovakia and Bulgaria experienced the largest gains in FDI in 2012 compared to 2011. In all three countries, the higher inflow of FDI stemmed mainly from an increase in intercompany lending from parent companies. Net FDI declined the most in the Czech Republic, Lithuania and Hungary. Portfolio investments were buoyant in Slovakia, Poland, and Croatia. High yields and declining risk perceptions attracted investors to the region.

Figure 26. Cumulative Net EU11 FDI Inflow, by Categories, in EUR Billion

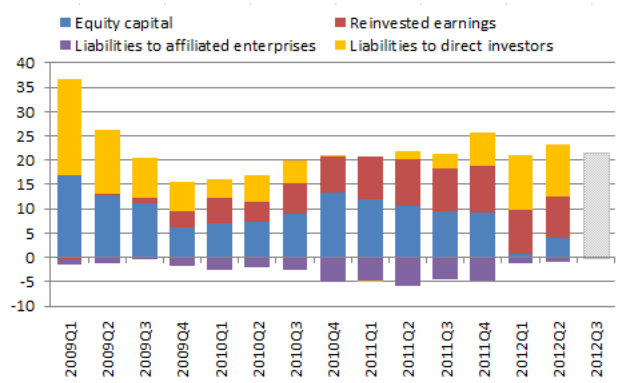
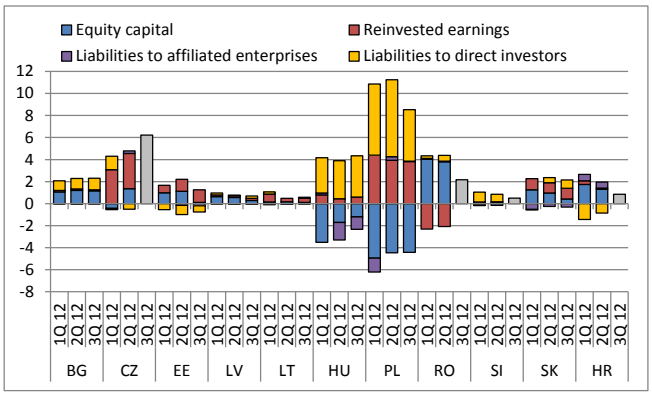


Figure 27. Cumulative Net FDI Inflow, by Country, in EUR Billion



Source: Eurostat; World Bank staff calculations.

Note: Intercompany lending (also known as 'other capital' in FDI) consist of two subcategories: (i) liabilities to overseas affiliates directed to outward related investment (borrowings from affiliates), and (ii) liabilities to overseas direct investors directed to inward related investment (borrowings from parent companies). The structure of FDI for Q3 2012 is not available.

The gross external debt for EU11 countries increased further by September 2012. Gross external debt-to-GDP ratios ranged from 49.9 percent in the Czech Republic to over 100 percent in Croatia, Slovenia, Hungary, and Latvia (Figure 28). Short-term debt increased in Slovenia, Latvia and Estonia, while it decelerated in all other countries, with the most significant decline in Slovakia (a reduction of 12.4 percentage points of GDP). In absolute terms, Slovakia and Hungary were the only countries in the region that further reduced their external debt on the back of significant reductions in the external debt positions of their monetary authorities. In Slovakia, this decline was driven mostly by a reduction in deposits held in the Central Bank. In the case of Hungary, it materialized on the back of repayments of IMF-EU loans and a decline in the Hungarian Central Bank's repo liabilities.

Sovereign borrowing not only increased the external debt of the EU11, but also contributed to a shift in the structure of external debt toward slightly longer maturities (Figure 29). EU11 countries increased their external government exposure by €40.5 billion, with most notable rises in Poland (by around by €20.1 billion), Slovakia, Hungary, and the Czech Republic. Compared to end-2011, the EU11 private sector reduced its external exposure by €7.1 billion. While the corporate sector (including intercompany lending) increased its foreign borrowing by €8.2 billion, the banking sector reduced its by €15.3 billion. All EU11 countries recorded a decline in banking sector external debt, with the highest reductions in Hungary, Poland, and Slovenia.

Figure 28. External Debt in EU11, (Percent of GDP)

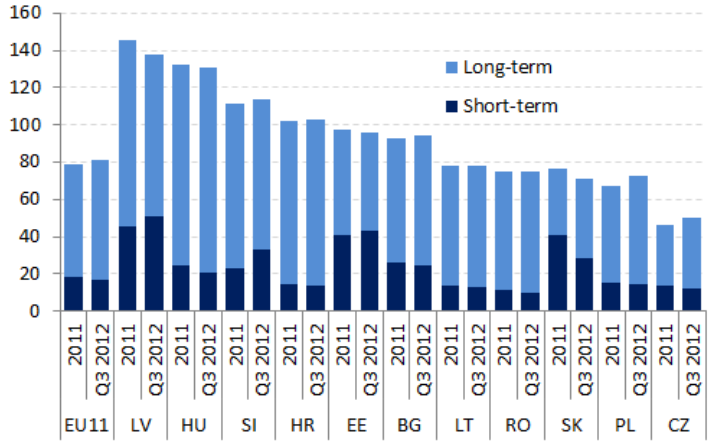
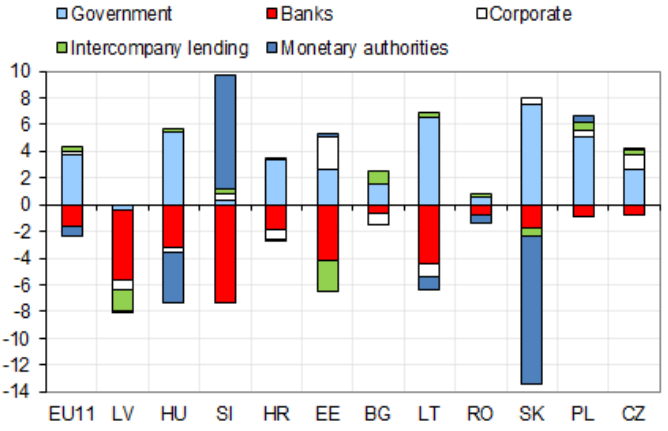


Figure 29. Breakdown of Changes in External Debt, 4th Quarter of 2011 to 3rd Quarter of 2012, (Percentage Points of GDP)



Source: Central banks; World Bank staff calculations.

Notes: For Hungary, data excludes the Special Purpose Entities.

INFLATION PRESSURES COMING FROM FOOD PRICES

Rising global food prices have put pressure on the EU11 countries' efforts to anchor inflation. Monetary authorities remain vigilant as the pass-through from global food prices tends to operate with a lag. Monetary policy remained accommodative in the EU11 in 2012. Policy interest rates went down.

Inflation pressures in EU11 remained strong with overall prices increasing by 3.7 percent in the first eleven months of 2012. Overall inflation accelerated in the third quarter of 2012 in the EU11, but slowed down again by the end of the year. The overall inflation gap between the EU11 and EU15 increased. The largest gap was in September 2012, when inflation in the EU11 was almost 2 percentage points higher than in the EU15. By November 2012, the difference diminished to 1.5 percentage points. In the third quarter of 2012 in particular, consumer price inflation picked up in most EU11 countries on the back of both unprocessed food price increases, the influence of seasonal factors, and processed food prices triggered by unfavorable weather conditions. Core inflation remained on a downward trend, reaching 2.5 percent in November 2012 (below the 3.3 percent peak recorded early in the year) and indicating that the price-reducing effects of subdued demand remained in place. Overall, the rise in prices was somewhat lower than in 2011 when EU11 inflation increased by 3.9 percent. Compared to 2011, only the Czech Republic, Croatia, Hungary, and Slovenia are experiencing accelerating price hikes in 2012.

Figure 30. Harmonized Consumer Price Index (HICP), Overall and Core, EU15 and EU11 (Percent, Year-on-Year)

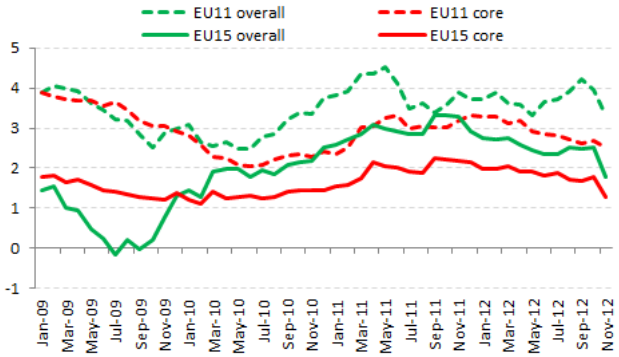
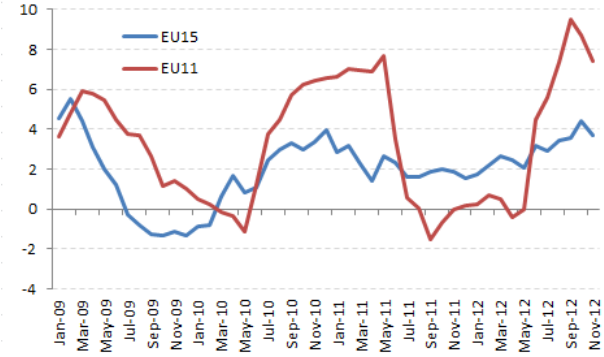


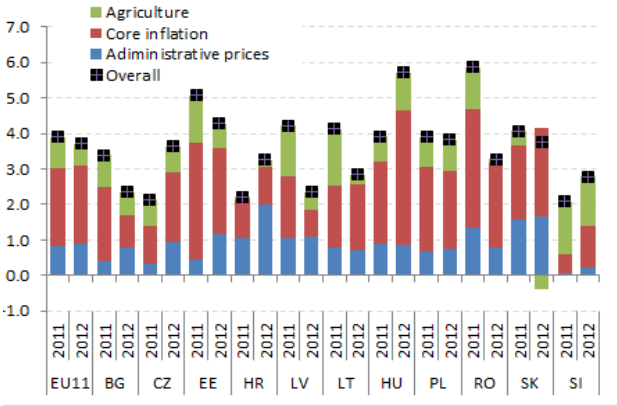
Figure 31. Food HICP, EU15 and EU11 (Percent, Year-on-Year)



Note: Core inflation is defined as overall index excluding energy and unprocessed food
Source: Eurostat; World Bank staff calculations.

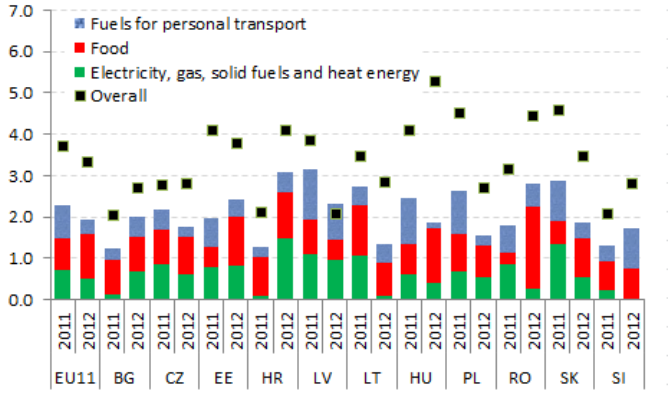
The adverse global agri-food supply shock pushed up food prices in the EU11 in 2012. The most notable increases were recorded in prices of soybeans, corn and wheat. Although the increase has been less than what was observed in mid-2008 and early 2011, food prices rose by an average 7.7 percent in the second half of the year (with a 9.5 percent peak in September 2012), with double-digit increases in the Czech Republic and Hungary. Drought in some EU11 countries added to the increase in prices. Food prices contributed almost one-fifth to the overall inflation in EU11, with the biggest contribution in Romania (Figure 33). October and November 2012 data suggest a declining trend in EU11 aggregate food prices, with food prices still on rise only in Slovenia.

Figure 32. Contributions to HICP
(In Percentage Points, Average, Year-on-Year)



Source: Eurostat; World Bank staff calculations.
Note: 2012 data refers to January-November period. The agriculture component is calculated as the sum of the HICP of fish, fruit and vegetables.

Figure 33. Contributions to HICP, Selected Categories
(In Percentage Points, End-of-Period, Year-on-Year)



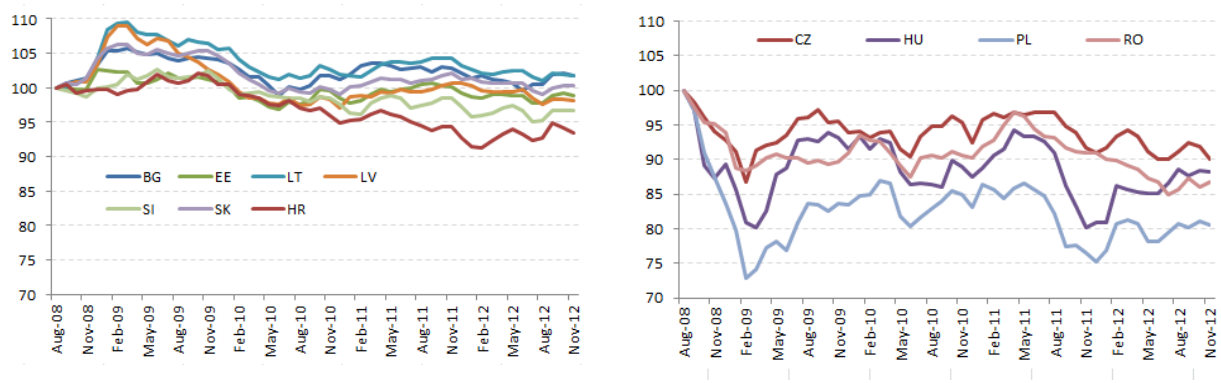
Source: Eurostat; World Bank staff calculations.
Note: 2012 data refers to November 2012.

In addition to food prices, fuel prices contributed to the rise in the overall inflation in the EU11. Strong contribution of the rise of fuel prices in overall inflation were seen in Slovenia, Bulgaria and Croatia. The significant pick-up in fuel prices was driven by international oil prices. Hikes in excises in most EU11 countries also contributed to the increase in fuel inflation. Energy-related administrative prices declined in almost all EU11countries, with the exception of Croatia and Bulgaria. The adjustments in gas and electricity prices in Croatia made a contribution of about one-third to the increase in the annual inflation rate in the third quarter of 2012.

The competitiveness indicators for Poland, Romania, Hungary, and the Czech Republic are noticeably below pre-crisis levels. In contrast, countries with pegged or managed exchange rates are close to August 2008 levels (Figure 34), with the exception of Croatia. The real effective exchange rate (REER) for only three EU11 countries—Bulgaria, Lithuania and Slovakia—remains above pre-crisis levels.

All EU11 countries witnessed depreciation of the real effective exchange rate deflated by CPI (REER) in 2012. The depreciation was most pronounced in Romania (6.3 percent, year-on-year, in the first eleven months of 2012) and the Czech Republic (4.1 percent, year-on-year, in the first eleven months of 2012). In the Euro area countries—Slovakia, Estonia and Slovenia—the REER appreciated by 0.7 to 1.4 percent in the first 11 months, which is less than for the Euro area as a whole, where the REER appreciated by a considerable 5.3 percent. Signs of real effective appreciation toward the end of 2012 (November and October 2012) are evident in Hungary and Poland, where REER appreciated by 8.1 and 4.9 percent, respectively, while other countries experienced, albeit weekend, depreciation pressures. Exchange rate fluctuations in all EU11 countries reflected a continuous uncertainty in the Euro area in 2012.

Figure 34. Real Effective Exchange Rates, CPI Deflated (Index: August 2008=100)



Source: BIS (broad indices comprising 61 economies); World Bank staff calculations.
Note: Movement upward denotes real effective appreciation.

Figure 35. Exchange Rates vs. EUR (Index: August 2008=100)

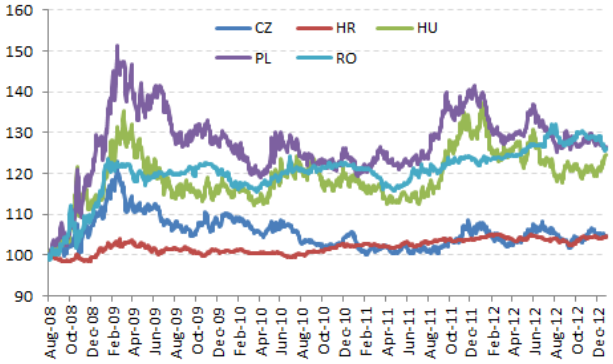
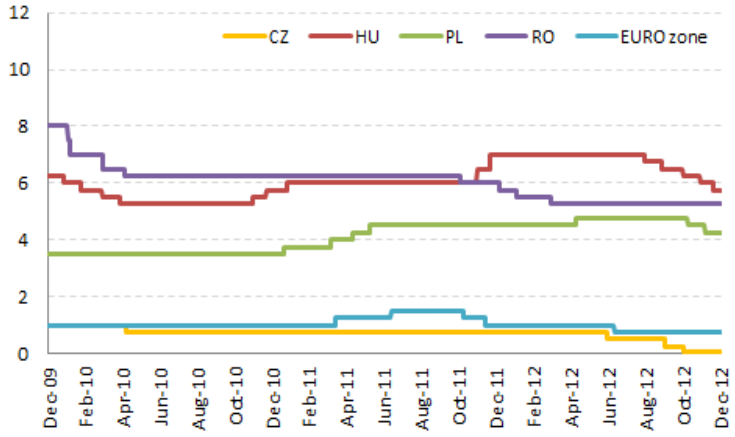


Figure 36. Exchange Rate, EUR vs. USD (Index: August 2008=100)

Source: Reuters; World Bank staff calculations.
Note: Movement upward denotes depreciation.

Weakening growth prospects in both the EU11 and EU15 created scope for monetary easing. In July, the European Central Bank (ECB) reduced the interest rate on its main refinancing operations by 25 basis points to 0.75 percent. Most of the central banks in EU11 pursued a wait-and-see policy, but all of them started decreasing their policy rates. Since July 2012, the Czech Central Bank decreased its policy rates in three steps to technically zero (0.05 percent). Similarly, the Central Bank of Hungary eased its monetary policy

Figure 37. Policy Interest Rates (Percent)



Source: Central banks; World Bank staff calculations.

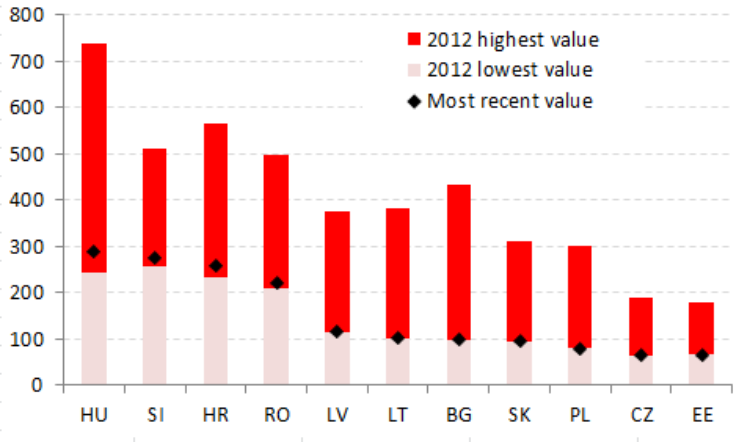
stance by reducing the policy rate from 7 percent in August 2012 to 5.75 percent in December 2012. Following an unexpected interest rate increase in May, the Central Bank of Poland left its policy rate unchanged for over six months until early November 2012; however, in order to respond to receding inflationary pressure and support the slowing economy, the policy rate was reduced by 0.25 percentage points in November and by another 25 basis points in early December. The Romanian Central Bank did not change its policy rate in the past months due to the upside risks to inflation. However, it used unconventional tools such as tight limits on repo volumes to restrict liquidity and limit the pressure on the exchange rate.

FINANCIAL SECTOR CONFIDENCE RETURNING

Improved market expectations in the Euro area, stemming from important institutional decisions and announcements, have brought down the cost of borrowing for the EU11 economies. The exposure of mother banks to EU11 continued to decline at a moderate pace in the first half of 2012, but constrained credit growth and growing nonperforming loans (NPLs) remain a burden. Domestic deposits remained the primary source of funding for the banking sector in the EU11.

Improved market conditions after the announced steps by the European Central Bank (ECB), and the central banks' quantitative easing, brought down the CDS spreads for EU11. After uncertainty in the first two quarters of 2012, the global market sentiment turned positive in end-July with announcements related to the management of the Euro crisis. Measures at the national and EU-level included: fiscal consolidation, the agreement by European institutions to bail out economies in difficulty, the agreement to create a European bank supervision authority, and the decision of the ECB to support economies in difficulty (Box 2.). EU11 countries benefited from the decline of CDS' in the somewhat calmed financial market, with half of the countries at their lowest levels seen in 2012. The strongest downward adjustment in CDS spreads occurred in Hungary, Croatia and Bulgaria, albeit from relatively high levels (Figure 38).

Figure 38. 5Y CDS, EU11 Countries (Basis points)



Note: Data as of December 18 2012.

Source: Reuters; Bloomberg; World Bank staff calculations.

Financial markets continued to differentiate among the EU11 countries on the basis of their economic fundamentals and/or perceived risks. As a result, Hungary, Slovenia, Croatia, and Romania have the highest CDSs. These are countries with weak public finances and/or fragile growth outlooks. The next batch of countries—Latvia, Lithuania, Slovakia, and Bulgaria—hover around 95 to 115 basis points, while the sovereign risk of Poland, the Czech Republic, and Estonia is priced below 80 basis points.

Box 2: Recent Policy Steps Aiming to Resolve the Euro-area Sovereign Debt Crisis

The third quarter of 2012 witnessed key policy decisions aimed at a resolution of the Euro area sovereign debt crisis. Notably: (i) after ECB's President Mario Draghi vowed to "do whatever it takes to preserve the euro", the ECB established a new program of Outright Monetary Transactions (OMTs)[2] to buy government bonds of struggling Eurozone countries on the secondary market in order to bring down their borrowing costs and ease global investor sentiment; (ii) with the announcement of a single banking supervisor, the EU began the groundwork for new pan-European agreements and institutions, aiming to provide longer-term sustainability.

Bond purchases under the OMT program, which, according to an ECB communication, is unlimited in quantity and fully sterilized, are conditional on application for assistance from the European Financial Stability Facility (EFSF) or the European Stability Mechanism (ESM), and on compliance with the conditions stipulated in the programs related to such assistance. The IMF will also be involved in supervising compliance with these conditions. The ECB will purchase government bonds with a residual maturity of between one and three years on the secondary markets only. In addition, in September 2012, the Governing Council also relaxed its requirements for securities eligible as collateral for loans provided in Eurosystem operations. The minimum credit rating threshold requirements were lowered, and the list of eligible assets was expanded to include securities denominated in some currencies other than the euro.

The plan to establish a European banking union was also proposed as an important step towards resolving the Euro area crisis. A banking union could help reverse the ongoing financial fragmentation and sever the negative bank-sovereign feedback loops. Over the summer, an EU Summit announced a single banking supervisor assigned to the ECB, making it possible for troubled Euro area banks to be recapitalized directly using ESM funds. However, there is considerable ambiguity on the details, importantly on the openness (Pan-European, Pan-EU or Euro area focused), scale (related to the size of the banks) and timing. Ultimately, the single banking supervisor's existence, besides ensuring stability, will serve to pool responsibility and justify two additional and necessary banking union elements that entail fiscal transfers (as in EFSF/ESM crisis facilities, at least indirectly): (i) a deposit guarantee scheme, and (ii) a bank resolution mechanism. Given the fiscal implications, none has been discussed in detail so far.

The EU11, with high exposures to Euro area banks (and subject to home-host supervision and resolution problems), have expressed concerns about the proposed solutions. The current proposal by the Commission leaves open the option for EU members outside the Euro area to join the single supervisory mechanism, but these countries would not benefit from ESM's direct bank capitalizations. Furthermore, bank resolution is

[2] In managing the debt crisis, the ECB announced an unlimited government bond purchase program. The ECB announced that for certain individual countries above a certain yield level, it was contemplating unlimited bond purchases in the secondary markets (OMTs), provided that the given member states received assistance in accordance with the fiscal consolidation conditions required by the ESM and access to market funding was continuous. Thus, it could provide a considerable amount of additional funds to countries that entered the ESM and have limited capacities.

envisioned to remain at the national level (yet within a common EU bank framework). The European bank for Reconstruction and Development (EBRD) outlines a number of implications from these decisions:[3] (i) ECB may focus on union-wide risks at the expense of local threats in smaller countries that are unlikely to pose a systemic threat; (ii) home-host bank resolution coordination problems may continue and financially integrated non-EU member countries will be excluded by definition; (iii) moral hazards may arise from national level resolutions which may not be as thorough if losses were to be borne at the national level, while the ultimate fiscal responsibility would be at a supranational level; and (iv) non-Euro area countries are worried that lack of access to ESM may distort the level playing field in banking in favor of multinational banks and at the expense of local institutions.

The spillover of the Euro area's financial sector uncertainties in the first half of 2012 slowed capital flows to EU11, but their pace is expected to pick up by the end of the year. Gross capital flows to EU11 countries (Figure 39) amounted to €20.7 billion by September, a contraction of almost two-thirds relative to the same period of 2011. While equity flows remained robust, bank-related debt flows declined (Figure 40). Improved confidence in the financial sector is expected to show an acceleration of capital flows to the EU11 in the second half of 2012.

Figure 39. Cumulative Gross Capital Inflows, EU11 (€ billions)

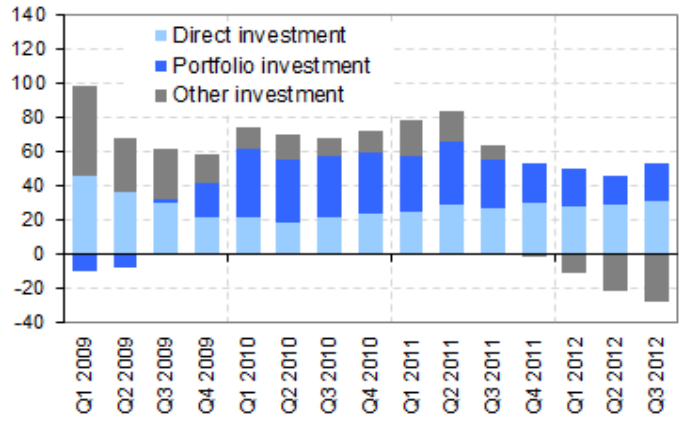
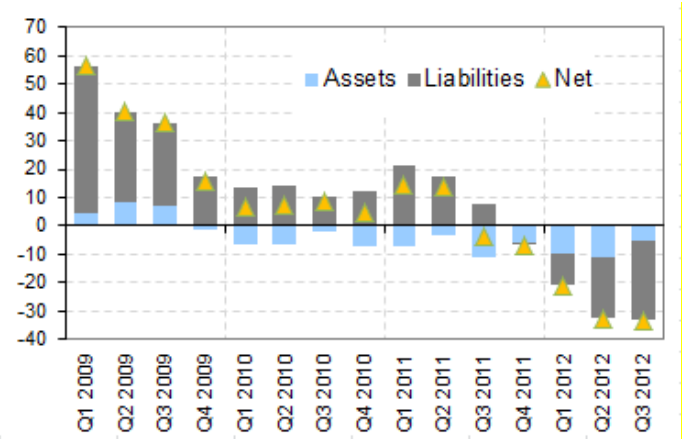


Figure 40. Cumulative Other Investments, EU11 (€ billions)



Source: Eurostat, World Bank staff calculations.

The pace of cross-border bank financial outflows from the EU11 decelerated in the first half of 2012, driven primarily by net repayment of debt. As reported by the Bank for International Settlement (BIS), cross-border claims by foreign banks dropped in all EU11 countries as parent banks downsized their operations (Figure 43). After some favorable movements in the first quarter of 2012 as bank claims on EU11 countries increased by almost 8 percent compared to 2011 (mainly as a result of the ECB's massive liquidity operations, Figure 42), by the end of June 2012 they declined again by 10 percent to EUR 303.6 billion, as the impact of the LTROs waned. This is still a notable 23.7 percent less than at the end of the second quarter of 2011.

[3] EBRD. 2012. "Chapter 3: Towards a Pan-European Banking Architecture." In *Transition Report*. London: EBRD.

Figure 41. Total International Claims by Sectors, 4th Quarter of 2009=100

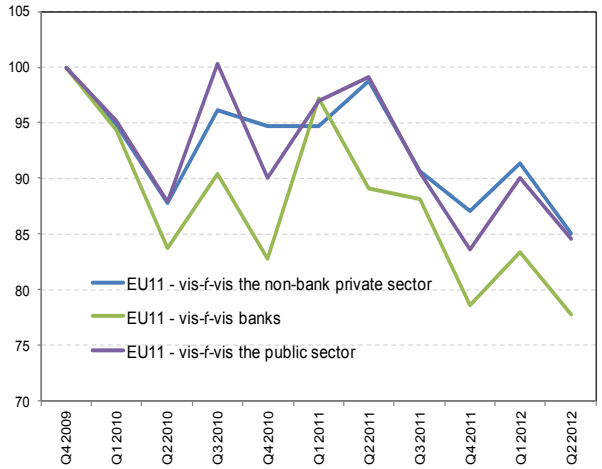
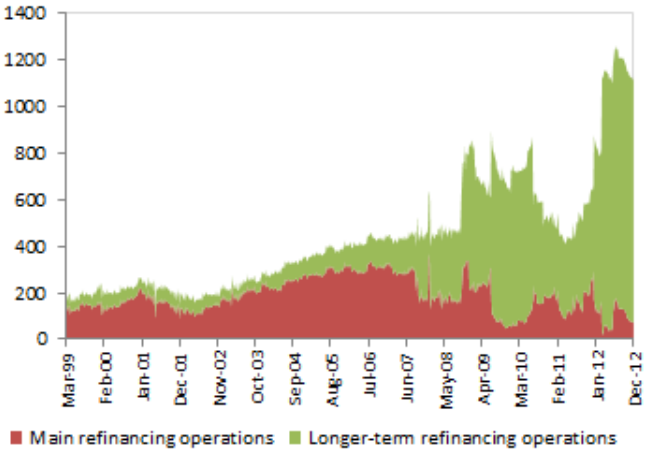


Figure 42. ECB Lending to Euro Area Credit Institutions (€ Billions)

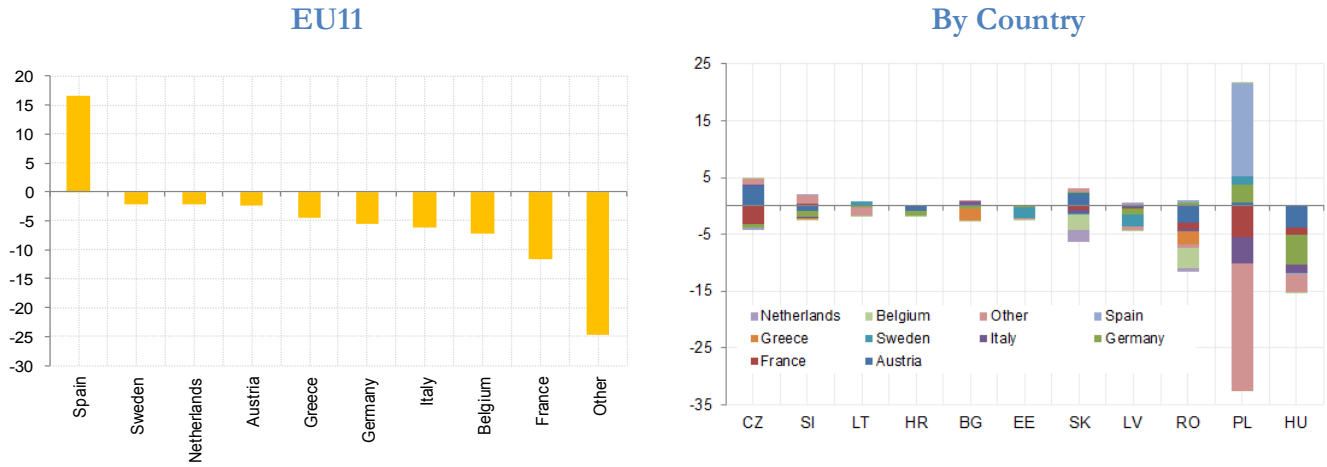


Source: European Central Bank; Bank for International Settlement; World Bank staff calculations.
Note: International claims include cross-border and foreign currency claims on local residents.

Differences in the pace of EU11 capital outflows remained significant in 2012. Cross-border outflows from the beginning of 2011 to mid-2012 declined in Slovenia, Bulgaria, Estonia, Latvia, and Croatia to the tune of over 10 percentage points of GDP; in Hungary, Romania, Lithuania, and Slovakia between 5-10 percentage points of GDP, and; in the Czech Republic and Poland up to 5 percentage points of GDP. However, the extent of cross-border deleveraging needs to be treated with caution, as cross-border institutions such as EBRD and EIB as well as institutional investors are not factored in these cross-border flows, and they are significant creditors of EU11 countries. Moreover, a notable part of the outflows represent repayments of liabilities by subsidiaries to parent banks in the condition of ample local liquidity.

In the last 18 months, the lenders' exposure vis-à-vis EU11 declined, but varied by country. From a creditor perspective, bank claims are concentrated in few countries—Austria, Belgium, France, Germany, Italy, the Netherlands, and Sweden—which account for three-fourths of total claims in the region. These countries reduced their absolute aggregate exposure in the region in the past 18 months, but not towards all countries. The aggregate regional picture conceals large cross-country differences (Figure 43). In the structure, compared to the beginning of 2011, Austrian, Italian, Dutch and Swedish creditors even increased their relative significance in EU11. Due to a bank acquisition in Poland and low concentration in EU11 in general, Spain increased its exposure in the region.

Figure 43. Change in Foreign Claims in the Banking Sector, in US$, 4th Quarter of 2010 to 2nd Quarter of 2012

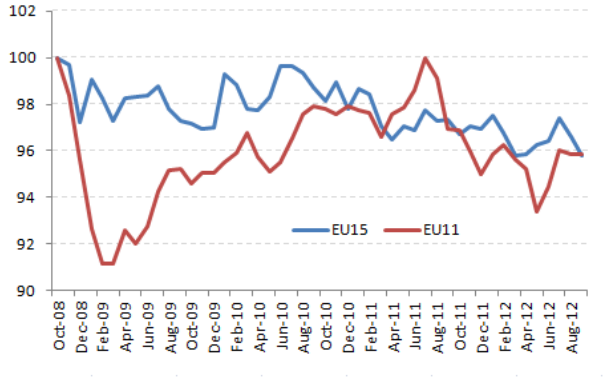


Source: Bank for International Settlement; World Bank staff calculations.
Note: Foreign claims include cross-border and local claims.

Lending to the private sector in the EU11 showed signs of recovery in the second half of 2012. While the pace of contraction of the private sector credit decelerated after May 2012 in EU11, it remained subdued at below pre-crisis levels (Figure 44). At the EU11 aggregate level, the negative rate of credit growth to households started diminishing faster than the one to the enterprise sector (Figure 45). Domestic financing to the private sector differed considerably across the EU11 countries. Notably, real credit to the private sector declined in most of them, with the only exception of Poland, which was solely accountable for the aggregate EU11 pickup. Hungary and Latvia recorded double-digit contractions. In Latvia, a large part of the contraction is explained by the removal of two closed banks from the country's credit statistics. In addition, in Hungary, lending was constrained by fiscal austerity measures.[4] More recently, the fall in private sector credit gained additional momentum in Croatia, where the economy is in a double-dip recession.

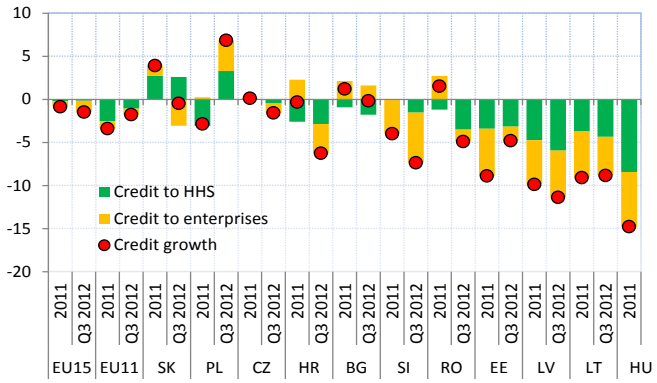
[4] These included new levies, a special tax imposed on commercial banks, limits on foreclosures, and an early repayment scheme for foreign exchange denominated mortgages.

Figure 44. Real Credit Growth, EU11 and EU15 (Index: Oct 2008=100)



Source: European Central Bank; World Bank staff calculations.

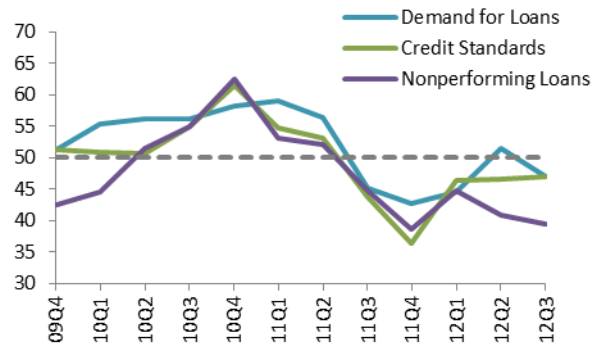
Figure 45. Contribution to Real Private Sector Credit Growth



Source: EU11 Central banks; European Central Bank; World Bank staff calculations.
Note: In countries with floating exchange rates, the exchange rate effects are excluded.

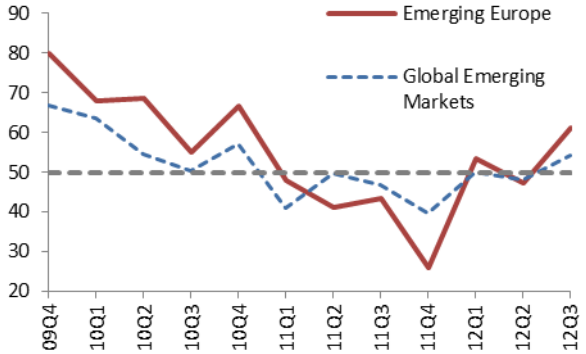
While banking sector lending conditions somewhat improved for the EU11 in 2012, tough credit standards did not impede lending activity as demand remained subdued. The improvement is most evident in overall funding conditions, which took the Lending Conditions Index to a level not seen since the end of 2010. Local funding conditions improved considerably in comparison with other emerging regions, too (Figure 46 and Figure 47). The improvements are due to easing from some key central banks as well as from the positive spillover effect of the ECB's OMTs facility, which helped facilitate access to funding. Yet, EU11 banks remained cautious in their lending practices and continued to apply tougher lending standards amid subdued economic activity.

Figure 46. Emerging Europe Bank Lending Conditions Index, by Categories



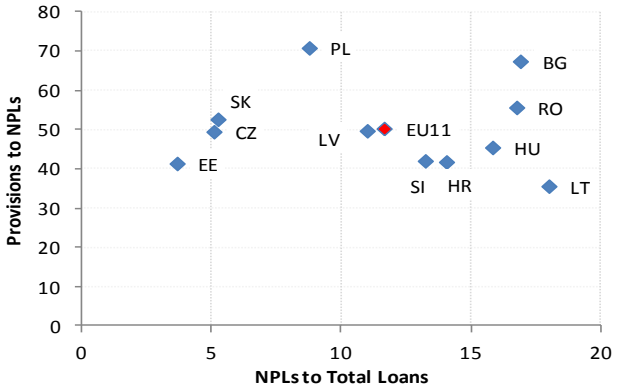
Source: IIF, World Bank staff calculations.
Note: 50=neutral

Figure 47. Funding Conditions in Local Markets, by Region



The legacy of NPLs was yet another factor contributing to low credit growth. NPL ratios deteriorated further in a number of EU11 countries on the back of balance sheet pressures in the corporate sector. Corporate sector NPLs increased further, as a result of reduced refinancing and rescheduling of loans, mostly in construction, manufacturing and trade. The EU11 average NPL ratio was close to 12 percent at the end of the third quarter of 2012 (Figure 48). NPL-to-total loan ratios are still highest in Lithuania, Bulgaria, Romania, and Hungary with a rate above 15 percent. In each of these countries, bank regulatory capital requirements relative to risk-weighted assets are above 12 percent, Slovenia being at the lower end (just above 12 percent) and Croatia with the highest capital adequacy ratio (at 20.5 percent) in September 2012. In contrast, Slovakia and Latvia saw their NPL-to-total loans ratios decline compared to end-2011, as loan resolution efforts achieved some successes and in Latvia, in particular, due to the closure of two banks with high NPLs. The coverage of NPLs increased only in Slovenia, Croatia and the Czech Republic.

Figure 48. Nonperforming Loans and Provisioning to Total Loans, EU11 countries, 3rd Quarter 2012 (Percent)



Source: IMF Global Financial Stability Report October 2012 definition and data; EU11 central banks; World Bank staff calculations.

Domestic deposits continued to be the primary source of funding in the EU11's banking sector. With slacking economic activity, credit demand remained subdued. Deposits performed better than credit in many EU11 countries, driving loan-to-deposit ratios down (Figure 49) and contributing to the organic growth of the banking sector. In some EU11 countries, mother banks under the pressure to improve their balance sheet positions encouraged their subsidiaries to diversify sources of funding, thus relying increasingly on domestic deposits.

Figure 49. Private Sector Deposits, Contributions to Growth

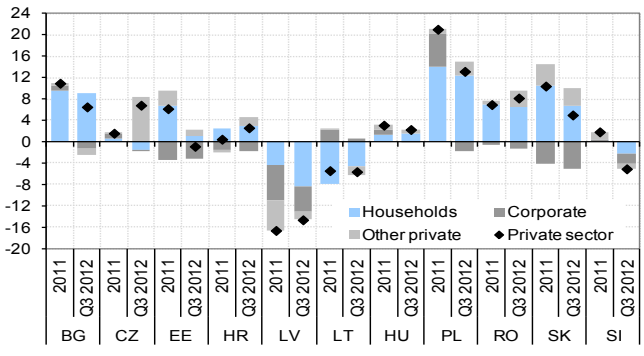
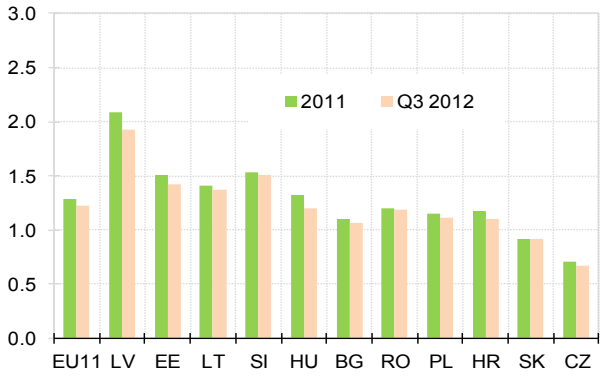


Figure 50. Private Sector Loan-to-Deposit Ratios



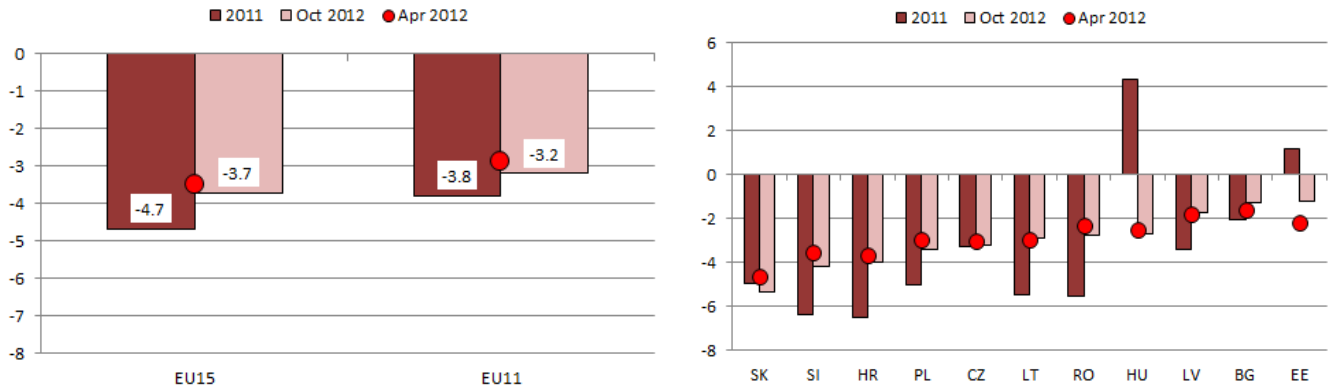
Source: Central bank websites; World Bank staff calculations.

CONTINUED FISCAL CONSOLIDATION

Against the backdrop of slowing growth across the region, EU11 governments continued their fiscal retrenchment in 2012. While the pace of fiscal consolidation decelerated throughout the year, it nevertheless helped to contain the increases in public debt-to-GDP ratios. Despite macroeconomic concerns and tight budget envelopes, most EU11 governments delivered their ambitious public investment programs.

As markets watch public finances closely, EU11 governments proceeded with fiscal consolidation in 2012 in spite of faltering growth. Based on the October 2012 fiscal notifications to Eurostat, fiscal deficits went down across the region, reaching an expected 3.2 percent of GDP in 2012, the lowest level since the global financial crisis (Box 3). The fiscal deficit reduction of 0.5 percent of GDP was slightly less than what was envisioned in the spring of 2012, and less than what was expected for the EU15 (Figure 51). Fiscal balances improved in most of the EU11 countries. Only in the case of Hungary, Estonia and Slovakia, the 2012 fiscal outturn deteriorated compared to 2011. In Slovakia, the deficit increased on the back of lower than expected VAT revenues. In Hungary and Estonia, the deterioration in fiscal balances was of a one-off nature and related to exceptionally good fiscal outcomes in 2011, when both countries recorded strong fiscal surpluses—Hungary due to the liquidation of the second pension pillar and Estonia due to increased revenues from emission rights.

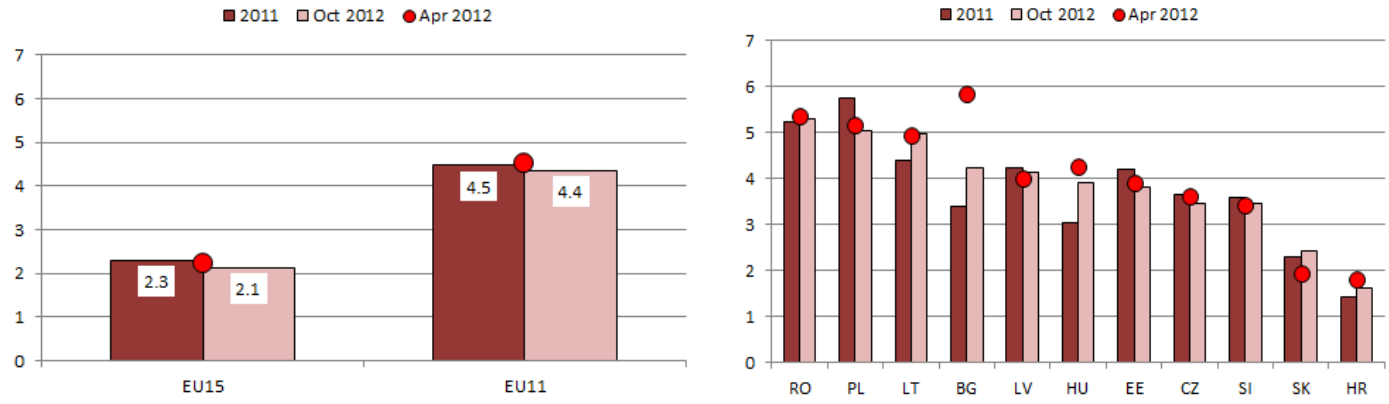
Figure 51. Planned and Projected General Government Fiscal Deficits, EU11 and EU15, 2011-2012 (Percent of GDP)



Source: Eurostat; October 2012 EDP notifications; April 2012 EDP notifications; World Bank staff calculations.

Many EU11 countries executed strong public investment programs in spite of their difficult fiscal situation. The governments' investment spending in 2012 was in line with what was planned in the spring of 2012. The last two years of the current EU financial perspective (2007-2013) provided additional incentives for many EU11 countries to ramp up their investment programs, especially in infrastructure. Only in the case of Bulgaria and Hungary, the optimistic assumptions regarding investment spending did not materialize—in Hungary on the back of increased fiscal consolidation efforts related to the correction of the excessive deficit procedure and in Bulgaria due to the overestimation of the EU funds absorption. In Croatia, the public investment-to-GDP ratio also went down due to the need to shrink the fiscal deficit.

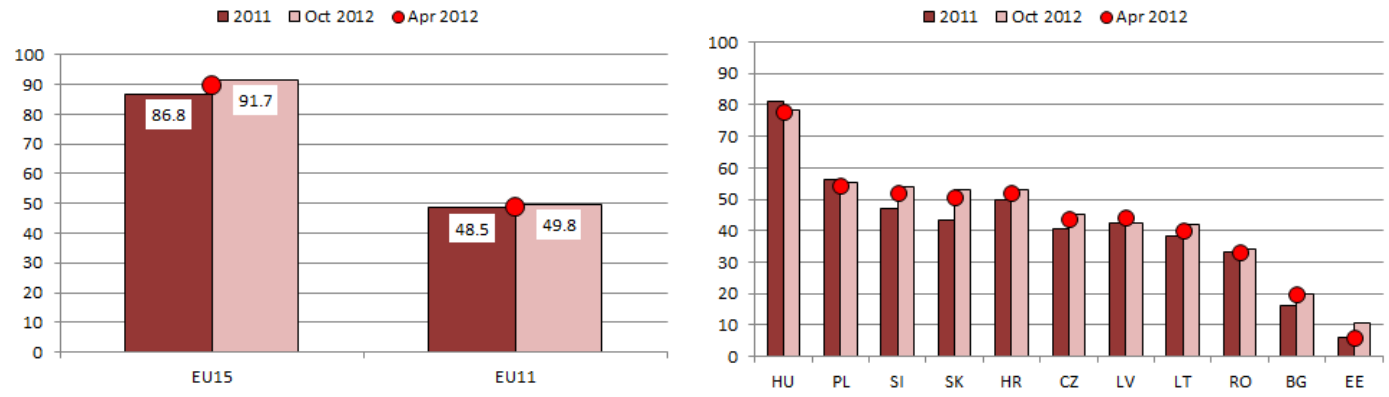
Figure 52. Planned and Projected General Government Investment Expenditures, EU11 and EU15, 2011-2012 (Percent of GDP)



Source: Eurostat; October 2012 EDP notifications; April 2012 EDP notifications; World Bank staff calculations.

Fiscal consolidation helped further moderate the rise in public debt in 2012, but the expected stabilization of the public debt-to-GDP ratio was not achieved. Weaker than expected economic growth, in spite of sustained fiscal efforts, brought increases in the EU11 debt-to-GDP ratio for the sixth year in a row. The increase in the EU11 indebtedness of around 1.3 percentage points of GDP in 2012 was much less than the expected increase in the EU15 (5 percentage points of GDP). In addition, public indebtedness relative to the size of the economies remained far lower in the EU11 than in the EU15. In Hungary and Poland (the EU11 countries with the highest public debt in the region) public debt-to-GDP ratios are expected to go down slightly in 2012. Public debt is expected to increase mostly in the EU11 countries that are also Euro area members, on the back of their contributions to the strengthened EFSF and ESM.[5] Public debt in Bulgaria increased following the Eurobonds issuance in July 2012.

Figure 53. Planned and Projected General Government Public Debt, EU11 and EU15, 2011-2012 (Percent of GDP)



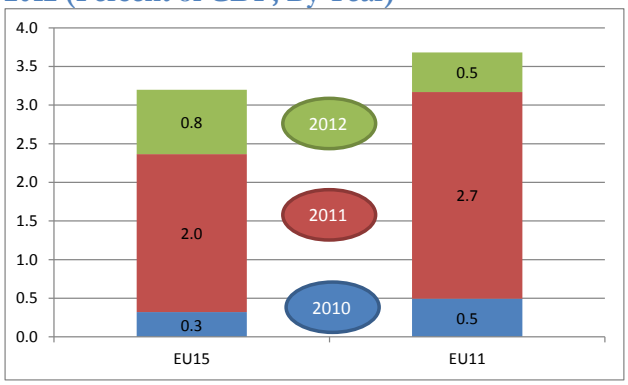
Source: Eurostat; October 2012 EDP notifications; April 2012 EDP notifications; World Bank staff calculations.

[5] Contributions to the ESM and the EFSF are based on Euro area member state shares in the paid up capital of the ECB.

Box 3. Fiscal Adjustment in the EU11 and EU15, 2009-2012*

Size and pace: Since the peak of the crisis in 2009, fiscal deficits have decreased considerably both in the EU11 and the EU15. The aggregate fiscal adjustment in the EU11 for the period 2009-2012 is expected to be around 3.7 percent of GDP, while in the EU15 it is expected to be around 3.2 percent of GDP. Most countries front-loaded their fiscal adjustments, taking advantage of the improved macroeconomic environment in 2010 and 2011, but also because of the continuous pressures coming from volatile financial markets. The biggest fiscal effort took place in 2011, when the general government deficit of the EU11 countries dropped by almost 3 percentage points from 6.5 percent of GDP in 2010 to 3.7 percent of GDP in 2011.

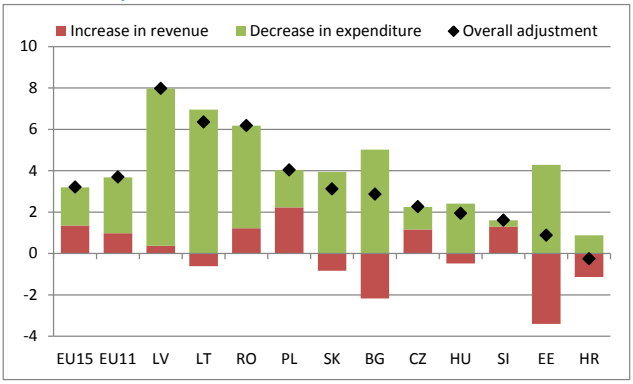
Figure 54. Fiscal Consolidation Effort in 2010-2012 (Percent of GDP, By Year)



Source: Eurostat; European Commission Autumn Forecasts 2012; World Bank staff calculations.

Composition: The EU11 countries have been making consolidation efforts on multiple fronts. Most countries have decided to resort to both containing expenditures and enhancing revenues. The governments have pursued bold fiscal adjustments, given the large structural deficits in a number of EU11 countries at the onset of the global crisis and the relatively large government size (vis-a-vis other countries with similar level of income per capita). In the EU11, around three-fourth of the fiscal adjustment is expected to have come from the spending side. In the EU15, the fiscal adjustment has been more broad-based than in the EU11, but expenditure adjustment also played a more important role than revenue adjustment.

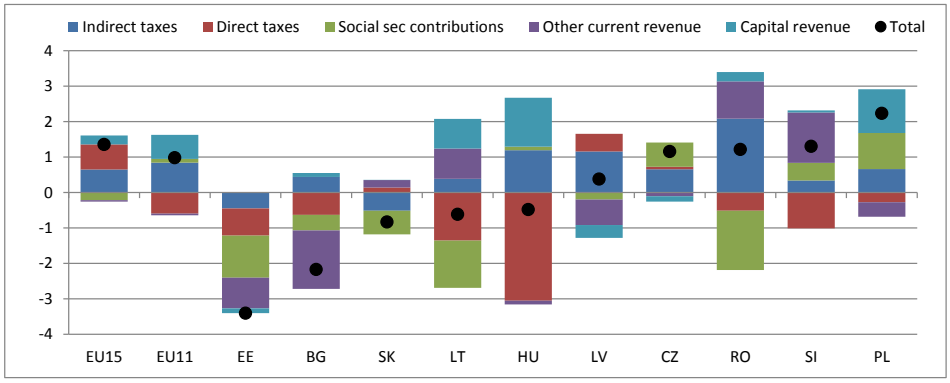
Figure 55. Composition of Fiscal Adjustment, 2009-2012, Percent of GDP



Source: Eurostat; European Commission Autumn Forecasts 2012; World Bank staff calculations.

Revenue reforms: In about one half of the EU11, the revenue-to-GDP ratio increased and contributed to the reduction in fiscal deficits. The governments focused primarily on hikes in less distortionary taxes, such as the VAT and excise. The share of direct income taxes-to-GDP declined in the majority of countries.

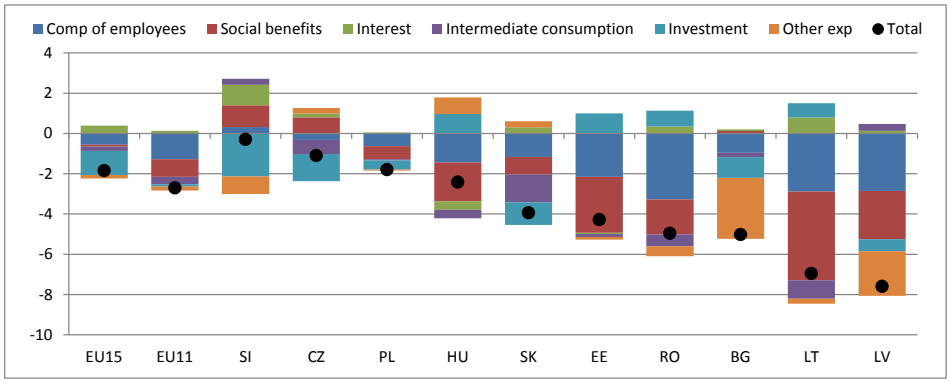
Figure 56. Change in Revenue Items, 2009-2012 (Percent of GDP)



Source: Eurostat; European Commission Autumn Forecasts 2012; World Bank staff calculations.

Expenditure reforms: All EU11 countries decreased their government size as a share of GDP. Most countries implemented measures aimed at reducing the compensation of employees through cuts and freezes of public sector wage bills and reduction in the public administration. Social benefits were significantly adjusted, especially in the Baltic countries, Romania and Hungary. Part of the expenditure reduction came from cuts in public investment. The significant co-financing needs of EU funds that supported investment projects proved fiscally challenging for a number of EU11 countries, while for others weaknesses in absorbing EU funds cut into public investments.

Figure 57. Change in Expenditure Items, 2009-2012 (Percent of GDP)



Source: Eurostat; European Commission Autumn Forecasts 2012; World Bank staff calculations.

Note: *In this box, we look at the fiscal adjustment undertaken by EU11 countries in 2010, 2011 and 2012, by comparing 2009 fiscal outcomes with the projected fiscal outcomes for 2012.

EU11 Economic Outlook and Policies for Growth

Mild Growth in the Near-Term

In the EU11, economic growth is expected to rebound from below 1 percent in 2012 to 1.3 percent in 2013. However, with heightened uncertainty, even this modest growth assumes that policies adopted in the Euro area can successfully avoid severe deterioration in international financial market conditions.

The EU11 economy is set to modestly expand in 2012, amidst a recession in the Euro area. The EU11 growth is expected to be around 1 percent in 2012—less than a third of the pace of growth of economic activity the region saw in 2011. The EU11 countries will retain their stronger growth performance over the EU15, which are on aggregate contracting. Compared to our June 2012 forecast published in the previous issue of the Regular Economic Report (RER), this represents a downward revision of 0.6 percentage points for 2012.

At the end of 2012, prospects for the EU11 look weaker than they did six months ago. In particular, the still weak economic situation in the Euro area and recent downgrades of economic forecasts for important trade partners of the EU11 (for example, Germany, but also Sweden, Finland) have led to a weaker than expected economic performance in the region. As a result, we adjusted our forecast for the EU11 growth in 2013 from the expected in June 2012 2.5 percent to 1.3 percent currently.

Table 1. EU11 Growth Prospects

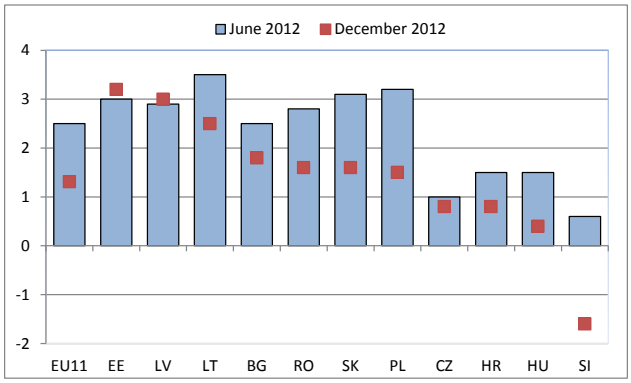
	2011	2012	2013
EU11	**3.1**	**0.9**	**1.3**
Bulgaria	1.7	0.8	1.8
Czech Republic	1.9	-1.3	0.8
Estonia	8.3	2.5	3.2
Latvia	5.5	5.3	3.0
Lithuania	5.9	3.3	2.5
Hungary	1.7	-1.5	0.4
Poland	4.3	2.2	1.5
Romania	2.5	0.6	1.6
Slovenia	0.6	-2.3	-1.6
Slovak Republic	3.2	2.5	1.6
Croatia	0.0	-1.8	0.8
Memo			
Euro area	**1.5**	**-0.4**	**-0.1**

Source: World Bank staff.

Note: Forecasts for the EU15 are from the EC Autumn Forecast. Forecast for Germany is from the Deutsche Bundesbank forecast from December 2012.

While most EU11 countries are expected to grow slower in 2013 than forecasted six months ago, the scale of downward revision varies. Growth in the Czech Republic, Croatia and Hungary is now projected to be below 1 percent in 2013. Slovenia is the only EU11 country projected to remain in recession in 2013.

Figure 58. GDP Forecasts for 2013 (Percent)



Source: World Bank Staff.

Notes: "June 2012" refers to the World Bank forecasts for 2013 from the previous issue of the EU11 Regular Economic Report from June 2012. "December 2012" represents the current forecast.

Under a baseline scenario, which assumes Euro area reforms will be implemented and the fiscal challenges in the US averted, the region will rebound slightly in 2013. The pace of recovery in the EU11 is expected to strengthen to 1.3 percent in 2013. Nevertheless, the overall growth performance in 2013 will be less than one half of the growth rate in 2011. Private consumption is expected to drive growth in the Baltics, Bulgaria and Romania, while investment may ramp up throughout the region (except for Slovenia, Poland and Hungary). The contribution of net exports is shrinking in Croatia, the Czech Republic, and Hungary, but is expected to remain relatively strong in Poland.

Unemployment in the EU11 is set to stay at current elevated levels. Despite the estimated pickup in economic activity in 2013, only small employment gains may materialize in the EU11. Riding on a continued (albeit slow) economic growth, unemployment rates will go down, but remain in double digits. Unemployment levels will remain stubbornly high in the near-term. The largest unemployment rise is expected in Slovenia due to the continuation of poor economic activity. Real wages are likely to follow the recent trend of growing slower than productivity, helping boost the competitiveness of the EU11.

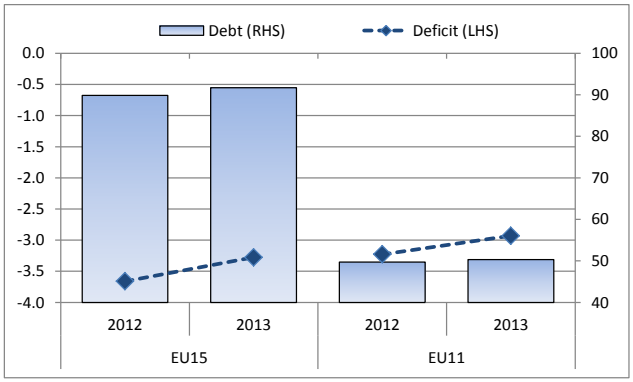
With the Euro area expected to remain in recession in 2013, EU11 trade flows will be subdued and will slowly pick up only in the medium-term. The small upsurge in demand from outside the EU for EU11 exports seen in 2012 is expected to be sustained and to support EU11 exports in 2013. In addition, intra-EU11 trade may rebound on the back of improved economic prospects and the base effect. EU11 imports are expected to remain subdued in 2013.

Net FDI flows to the EU11 will likely accelerate. The EU11 should continue to remain an attractive FDI destination, especially if progress in improving the business environment continues (see Annex 1). Several EU11 countries will pursue privatization deals in the services sectors (such as banking and insurance), which are expected to further spur FDI to the region. Gross external debt-to-GDP ratios in the EU11 are expected to stabilize around current levels in the near-term.

Accommodative monetary policies are expected to give a boost to domestic demand in 2013. Interest rates are set to remain low. Monetary policy should continue to help to buffer the EU11 against external shocks by keeping exchange rates stable and inflation expectations in check. At the same time, downside risks to the inflation outlook may materialize if international prices pressures of commodities increase.

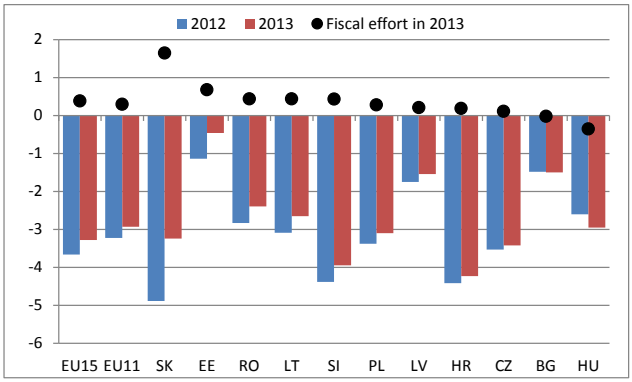
The EU11 governments are planning to continue their gradual fiscal consolidation efforts in the near-term. According to the EC Autumn Forecast, the aggregate EU11 deficit is expected to narrow in 2013 by 0.3 percent of GDP to around 3 percent of GDP, and the public debt-to-GDP ratio will increase only marginally by 0.6 percentage points (Figure 59).

Figure 59. General Government Deficits and Debt, EU11 and EU15, 2012–2013, Percent of GDP



Source: EC Autumn Forecast; World Bank staff calculations.

Figure 60. General Government Deficits, EU11 and EU15, 2012–13, Percent of GDP

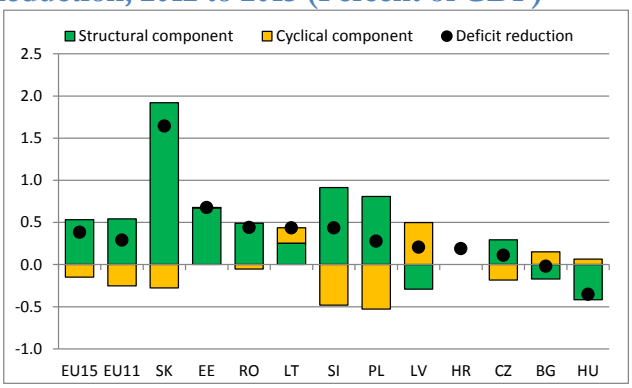


Source: EC Autumn Forecast; World Bank staff calculations.

Note: Croatia data do not yet comply fully with the ESA and some spending is likely to bring the deficit up in 2013.

In the light of weak growth, the fiscal improvement will come only from the correction in structural balances. The pro-cyclical fiscal tightening next year is forecasted to deliver only modest reduction in the overall fiscal deficit, as cyclical factors weigh down on consolidation efforts. This is particularly visible in Poland and Slovenia where the output gap is expected to widen considerably next year, but the governments nevertheless will likely follow their fiscal consolidation strategies.

Figure 61. General Government Fiscal Deficit Reduction, 2012 to 2013 (Percent of GDP)



Source: Eurostat; European Commission Autumn Forecasts 2012; World Bank staff calculations.

Most of the EU11 governments have tabled draft budgets that envisage further fiscal consolidation in 2013. In light of elevated fiscal deficits, the majority of EU11 countries are moving ahead with fiscal adjustment. Most countries are well advanced in their legislative process of budget approval and are determined to ensure that fiscal targets are met in spite of the weaker growth outlook. However, in Croatia, the Parliament adopted the 2013 budget that increases spending in a quest to support growth through public investments and subsidies. In Poland, similar measures to prop up growth are planned to be implemented, but outside of the budget. In many countries, key expenditure measures for bringing about the reduction in fiscal

deficits are containment measures from the past few years in the form of freezes or reductions in public sector wages and pensions. Efforts on the expenditure side are complemented in some countries with measures to broaden the tax base and strengthen tax administration. Seven EU11 countries are planning changes in their tax systems. The Croatian government has adopted changes to the VAT law and replaced the zero percent preferential rate with a five percent rate (for bread, milk, books, medicines and surgical implants), and the Czechs adopted an increase of one percentage points in the VAT rates from 2013 to 15 and 21 percent. Three countries (the Czech Republic, Hungary, and Slovakia) are planning increases in direct taxation, while Slovenia and Latvia decided to lower tax rates for corporates and individuals respectively. Bulgaria plans to broaden the tax base by introducing 10 percent tax on income from bank deposits. In addition, Slovakia has decided to drop the flat-rate system and has increased the VAT rate to 23 percent from 19 percent previously.

Table 2. Fiscal Measures in 2013 Draft Budgets

	Pensions	Public wages	New revenue measures		
	Freeze	Freeze (or cut)	VAT	Direct Tax	Others
BG				✔	✔
CZ	✔*		✔	✔	✔
EE					✔
HU		✔		✔	✔
LV		✔		✔	✔
LT	✔	✔			✔
PL		✔			✔
RO	✔				✔
SK				✔	✔
SI	✔	✔		✔	✔
HR		✔	✔		✔

Source: World Bank staff.

Notes: In Latvia there will be wage corrections for certain categories of civil servants. In the Czech Republic no freeze, but moderation in pension increases is planned.

An extended and even deeper recession in the Euro area than the current one would spill over to the EU11. A protracted recession in the Euro area presents the key downside risk to the baseline projections for the EU11 near-term outlook, which assumes that Euro area sovereign debt problems will not worsen. The EU11 economic prospects are already somewhat fragile, especially for countries whose economies are closely linked through trade with troubled Euro area countries. A major deterioration of conditions in the Euro area could reduce GDP growth in the EU11 by about 2 percent to 4 percent compared to the baseline and force contraction on the economy.

ECONOMIC POLICIES FOR GROWTH IN THE EU11

With an uncertain economic outlook in the medium term, the EU11 need to pursue decisive economic policies on two fronts. First, a prudent macro policy stance in the EU11 should be pursued to shore up the confidence of financial markets. Second, the medium-term economic growth potential of the EU11 can only be realized if structural barriers to economic activity are removed.

A prudent macro policy stance in the EU11 should be pursued to shore up the confidence of financial markets. The Euro area sovereign debt crisis is contributing to an erosion of confidence in the financial, economic and monetary systems of the EU. To strengthen confidence, the Euro area member states will have to put their public finances in order, stabilize their banking sectors, and implement structural reforms consistently so that their economies become more competitive. In the EU11 in particular, keeping monetary policy accommodative will continue to buffer the EU11 against external shocks and help defend against Euro area volatility. Prudent financial sector polices need to be geared in such a way as to ensure access to credit for viable borrowers, while safeguarding the stability of the financial system. The EU11 governments should calibrate fiscal consolidation efforts to support growth.

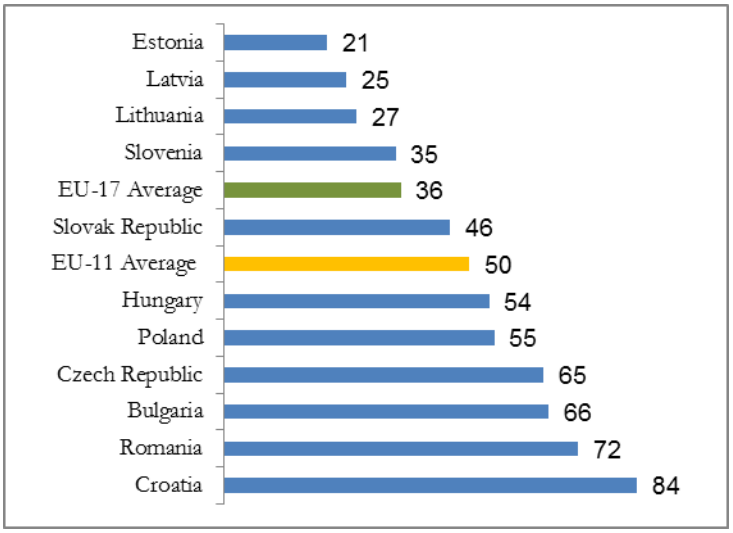
The medium-term economic growth potential of the EU11 can only be realized if structural barriers to economic activity are removed. Strengthening growth prospects can be invaluable for ensuring access to financial markets at attractive prices and attracting investment. Both product and labor market regulations are pivotal for enhancing the productivity and competitiveness of the EU11. Simplifying business regulations (Annex 1), strengthening the efficiency of delivery of public services, and protecting minority shareholders against misuse of corporate assets for personal gain are among the areas where some EU11 countries could pursue reforms to build up the private sector and make it easier to attract investment and do business. Moreover, providing incentives for labor mobility, making public finances more sustainable, adapting social security systems to demographic developments, and harmonizing regulations across borders will soften the constraints imposed by demographic threats and produce sizable returns in income convergence with the EU15 (see the Special Topic: *The Economic Growth Implications of an Aging European Union* of this RER).

Annex 1: Addressing the Business Environment Challenges in EU11

The EU11 countries continue to actively reform their business environments. These efforts have brought positive results in improving the regulatory environment for firms. The EU11 countries recognize that more work needs to be done in order to remain competitive and create environments conducive to entrepreneurship and job creation.

In 2012, the average ease of *Doing Business* rank for the EU11 countries was 50 among 185 economies in the world. However, it hides a wide variance (Figure 59).[7] Estonia, Latvia and Lithuania are in the top 30 globally, while Bulgaria and Romania rank 66 and 72.[8] Croatia still has the furthest to go in this group, ranking 84. Within-country analysis—looking into the 10 individual indicators that make up the ease of *Doing Business* rankings—shows that some of the most efficient and some of the most lagging practices in the world are features of the EU11. For example, Lithuania is ranked 5th out of 185 economies on the ease of registering property, with only 3 procedures required to transfer a property title which take 3 days and costs less than an average person's annual income. At the same time, in Croatia the same would take only 2 procedures more but last 104 days and cost 5 times as much.

Figure 62. Ease of Doing Business Ranking for the EU11, 2013[6]

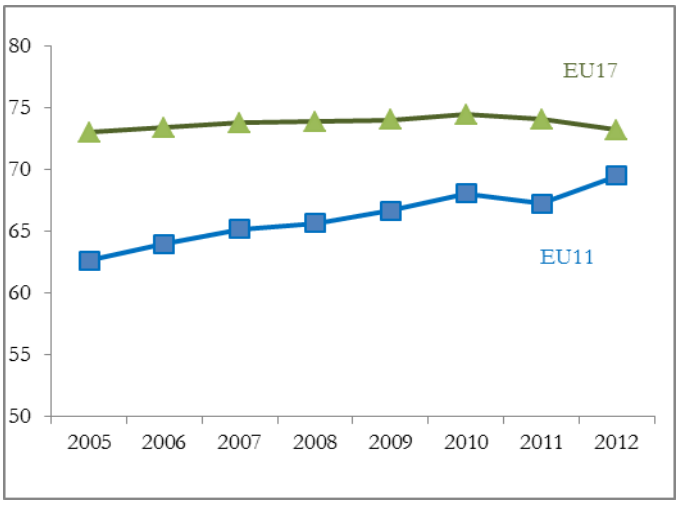


Source: *Doing Business* database
Note: The ease of doing business ranking measures the regulatory performance of economies relative only to the performance of others. It does not provide information on how the absolute quality of the regulatory environment is improving over time. Nor does it provide information on how large the gaps are between economies at a single point in time.

[6] The group of EU17 countries comprises: Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom.
[7] The *Doing Business* methodology has its limitations. Other areas important to a business such as a country's proximity to large markets, the quality of its infrastructure services (other than those related to trading across borders), the security of property, the transparency of government procurement, macroeconomics conditions or the underlying strength of institutions—are not measured directly by *Doing Business*.
[8] Out of 185 economies included in the *Doing Business 2013* database.

In the past decade, the EU11 have advanced markedly in the quality of business environment.[10] For the EU11 countries, the European Union entry has been marked by an intense effort to align regulations and institutions to the most efficient practices found in the rest of the EU. And indeed, over the past decade, the gap between the EU11 and the rest of the EU member states (EU17) has narrowed notably (Figure 64). This improvement can be attributed to the 223 positive reforms recorded since 2005 that affect the *Doing Business* indicators—ranging from streamlining business start-ups to amending insolvency regimes. Estonia, for example, is now at the same level in regulatory practices as the older EU countries. In the latest *Doing Business* report, Poland was recognized as the country that improved the most on the ease of *Doing Business* ranking (see Box 3). Other countries in the region were also active in reforming their regulatory environments for business. Aside from Poland, reforms were also recorded in Bulgaria, Croatia, the Czech Republic, Hungary, Lithuania, Romania, Slovakia, and Slovenia.

Figure 63. Distance to Frontier (Percentage Points)



Source: *Doing Business* database
Note: Distance to the frontier illustrates the distance of an economy to the "frontier," and the change in the measure over time shows the extent to which the economy has closed this gap. The frontier is a score derived from the most efficient practice or highest score achieved on each of the component indicators in 9 *Doing Business* indicator sets (excluding the employing workers and getting electricity indicators) by any economy since 2005.[9]

The ease of getting credit and registering property are the only two areas of *Doing Business*, where the EU11 countries are doing better than the rest of the EU (Figure 64). This indicates that there are both efficient administrative processes and legal institutions present in the region—due to the improved legal protection of lenders and credit information systems that distribute a broad range of information on potential borrowers.

- **Latvia, Poland, Romania, and the Slovak Republic are among the top 25 countries globally with respect to the ease of getting credit.**[11] This year, Romania strengthened its legal framework for secured transactions even further by allowing the automatic extension of security interests to the products, proceeds, and replacements of collateral. Hungary also improved access to credit information by passing its first credit bureau law mandating the creation of a database with positive credit information on individuals.
- **Property registries in EU11 countries are fast, efficient and affordable.** On average transferring property in the EU11 countries takes only 5 procedures, lasts a total of 37 days

[9] For more information, please see the *Doing Business* website.
[10] *Doing Business 2013* report
[11] The ease of getting credit indicator comprises two indices, which look at the extent of credit information about borrowers available to lenders and the strength of protection of creditors.

and costs 2 percent of the property value. Excluding Croatia and Slovenia where this process is still quite lengthy, the average time for the EU11 is only 21 days. In 2011/12, the Czech Republic made registering property easier by allowing the cadastral office online access to the commercial registry's database and thus eliminating the need for obtaining paper certificates from the registry before applying for registration at the cadastre.

Box 4. Poland Improved the Most in 2012

In the *Doing Business 2013* report, Poland has been recognized as the global leader in introducing key reforms to improve its business environment. In 2011/12, the country implemented reforms in 4 areas measured by *Doing Business*: registering property, paying taxes, enforcing contracts, and resolving insolvency. Poland made property registration faster by introducing a new caseload management system for the land and mortgage registries and by continuing to digitize the records of the registries. This reduced the time it takes to transfer a property in Warsaw by 94 days.

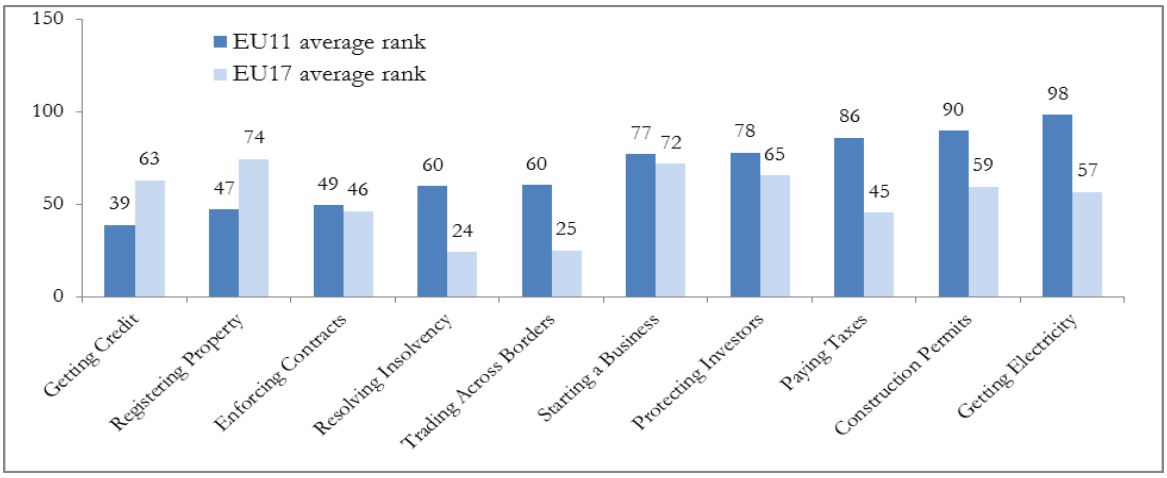
Poland also made paying taxes easier for companies by promoting the use of electronic filing and payment systems, which led to a reduction in the number of physical interactions between companies and the tax administration and resulted in a decrease in the time to comply with taxes.

Poland made enforcing contracts through the courts easier by amending the civil procedure code and appointing more judges to commercial courts. This reform led to a reduction in the cost to enforce a contract by 4 percent of the claim but more importantly it cut the time that it takes to do so by 145 days.

Poland also strengthened its insolvency process by updating guidelines on the information and documents that need to be included in the bankruptcy petition and by granting secured creditors the right to take over claims encumbered with the right to take over pledged assets in case of liquidation.

While large improvements were made by the countries in the EU11 region, the reform agenda in these areas remains unfinished. Courts in the EU11 countries are affordable, but the average time to enforce contracts is still quite long—more than 500 days**.** This means that a company that is disputing a commercial case has to wait for more than a year-and-a-half to resolve its case. The Slovak Republic has recently made enforcing contracts easier by adopting several amendments to the code of civil procedure, which is intended to simplify and speed up proceedings as well as to limit obstructive tactics by the parties to a case.

Figure 64. EU11 and EU17 *Doing Business* Average Rank, 2013



Source: *Doing Business* database

Additional areas where the EU11 could improve the most deal with construction permits and getting electricity. As some of the best performers globally are from the EU17 group, many lessons could be drawn in these areas.

- **Getting a construction permit** takes a relatively long time in the EU11 and requires the involvement of numerous agencies, taking on average 19 different steps and lasting more than 200 days. Within the EU11, it is fastest to obtain a construction permit in Hungary, where it takes 102 days, but this is still relatively long compared to Finland where it takes only 66 days to do so. The cost to get a construction permit in EU11 ranges from 6 percent of average income per capita in Hungary to nearly 6 times the average income in Croatia. Although Hungary is where getting a construction permit takes the least amount of time and is the cheapest, entrepreneurs must go through 26 different steps to do so, making it a very complex process. In Denmark and Spain, by contrast, it only takes 8 different steps for the same process.
- Obtaining an **electricity connection** is not as complex in the EU11, averaging only 5 different procedures, but is relatively expensive (251 percent of average annual income per capita) and takes a long time (55 days on average). On the other hand, in Germany, which is ranked second in the world on this indicator, the same process takes only 17 days and costs only half of an average person's annual income. In Romania, the same process takes 223 days and costs nearly 6 times the average annual income per capita.

SPECIAL TOPIC:

THE ECONOMIC GROWTH IMPLICATIONS OF AN AGING EUROPEAN UNION[12,13]

Abstract: The current and projected low fertility levels for Europe imply that the region will go through an unprecedented process of population aging, causing dramatic changes in the age structure of European societies. These changes in the age structure can have significant effects on economic growth and deeply affect the prospects of income convergence across the EU economies. This paper analyzes the quantitative impact of the projected demographic changes on economic growth through their effect on the factors of production, as well as the role that these will play in shaping income convergence in the region in the decades to come. The empirical results indicate that EU11 is likely to experience a sizable reduction in income per capita growth and thus in the speed of income convergence to the rest of the EU due to the expected demographic developments in the region. However, increasing labor force participation as well as improving the skill level of the labor force in the EU11 appears to be a powerful instrument for fostering economic growth and further convergence in the EU in the context of aging societies.

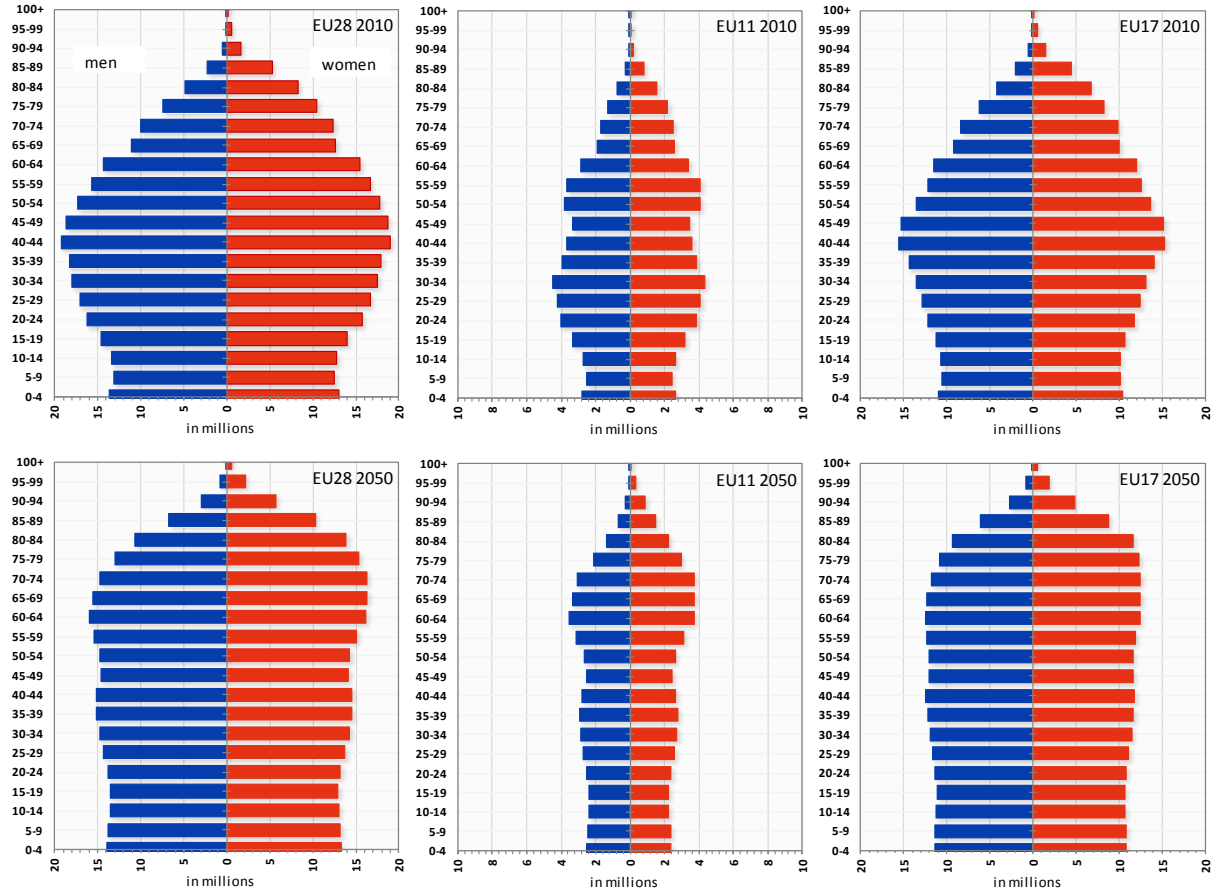
[12] This special topic note is part of a larger Europe and Central Asia (ECA) region's effort to understand the effects of aging in Europe. A regional ECA flagship report on aging is expected to be published in 2014.

[13] The authors are grateful for valuable comments from: Nina Arnhold, Simon Davis, Xavier Devictor, Doerte Doemeland, Roberta V. Gatti, Peter C. Harrold, Satu Kahkonen, Leszek Kasek, Igor Kheyfets, Johannes Koettl, Stella Ilieva, Markus Repnik, Ana L. Revenga, Kaspar Richter, Alberto Rodriguez, Carolina Sanchez-Paramo, Emily Sinnott, Erich Striessnig, Yvonne M. Tsikata, Hernan Winkler, and Asta Zviniene.

Aging in Europe: An Unavoidable Demographic Trend

The current and projected low fertility levels for Europe imply that the region will go through an unprecedented process of population aging, causing dramatic changes in the age structure of European societies (Figure 1).[14] In less than four decades, over a third of the population in Europe is projected to be above 60 years of age and over a quarter of the population will be above 65. The old-age dependency ratio, defined as the ratio of persons 65 years of age and older over the working age population (20-64), is thus expected to rise strongly in the coming decades.

Figure 1. Population Pyramids for Europe—EU28, EU17 and EU11, 2010 and 2050

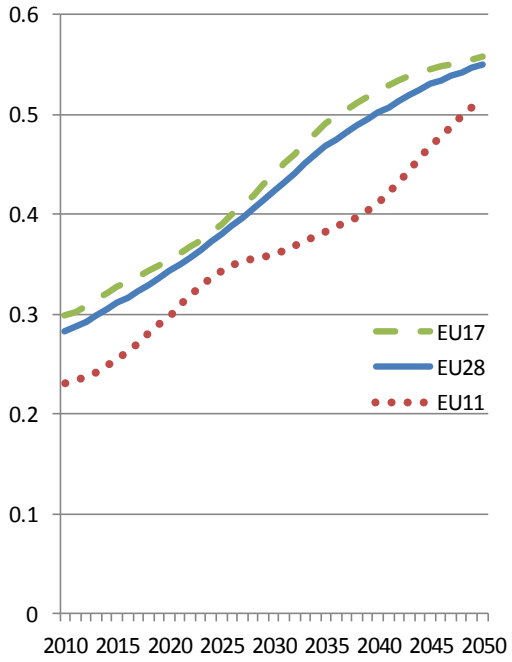


Source: United Nations, 2011 (medium variant).

[14] The country group EU28 comprises all 27 European Union members plus Croatia, which is scheduled to join the Union in July 2013. The country group EU11 comprises: Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia. EU17 represents all EU member states less EU11.

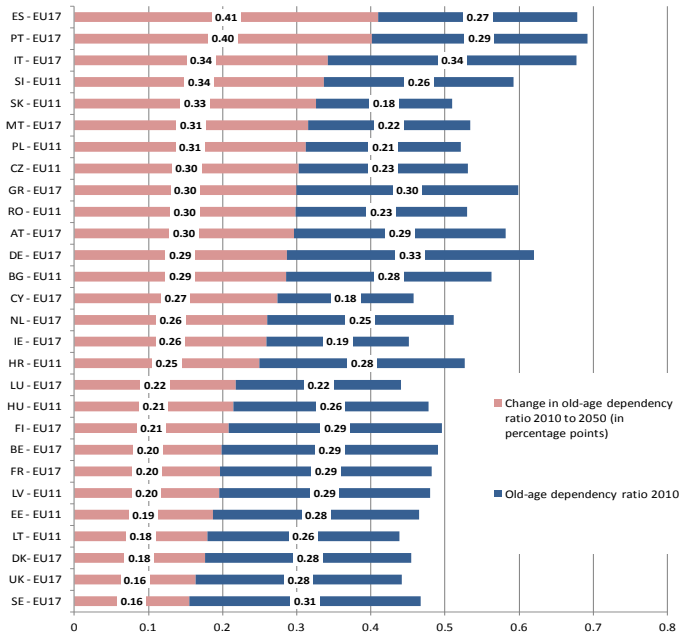
In the forthcoming four decades, the old-age dependency ratio in the EU11 region is expected to increase at a higher speed than in the EU17 (Figures 2 and 3). By 2050, most of the EU11 economies will have old-age dependency ratios at or above the EU28 average. In 2010, the average old-age dependency ratios across the EU17 economies indicated that there were 3.53 working-age persons (in the age group 20-64) for each old-age dependent. This number is slightly higher in the EU11 countries, where each person above the age of 65 years is maintained by 4.32 working age individuals. The expected changes in the age distribution of the European population lead to a reduction of this ratio to 1.79 working age persons per old-age dependent in the EU17 by 2050 and 1.93 for the EU11.

Figure 2. Old-Age Dependency Ratio, 1950-2050 (Medium Projections From 2010)



Source: United Nations, 2011 (medium variant)

Figure 3. Old-Age Dependency Ratio, Change 2010-2050 (Percentage Points) and Level 2050—EU11 and EU17



Source: United Nations, 2011 (medium variant)

The changes in the age structure of Europe's population can have significant effects on economic growth and deeply affect the prospects of income convergence across the EU economies. Demographic changes have an effect on income growth through the role which age structure plays as a determinant of the accumulation of factors of production. Since savings (and thus investment) as well as labor supply vary over the life cycle, age structure dynamics are expected to have a direct effect on capital deepening. Furthermore, if there are differences across age groups in terms of their human capital stock, aging may also lead to additional effects on labor productivity and innovation capabilities, thus affecting total factor productivity growth. Aging is also expected to affect the structure of the economy due to the differences in the sectoral composition of consumer demand by age group, with an expected increase in the share of non-tradables, in particular services related to health care. In addition, these demographic changes will have large macroeconomic implications by affecting public finances, increasing the relative size of pensions and health expenditures in government spending. To the extent that these changes in the composition of government expenditures crowd out more productive investments, we expect to observe negative

growth effects in the future through the public finance channels. Counteracting these demographic developments in Europe, and in particular in the EU11 where such trends have been dubbed "the third transition" (see World Bank, 2007), requires the design of long-term oriented policies with the aim of increasing participation in labor markets and labor productivity of employed workers.

This paper analyzes the quantitative effect of the projected demographic changes in the EU on economic growth, through their effect on the factors of production, as well as the role they will play in shaping income convergence in the region in the decades to come. The current study should be framed within a broader research program on the economic effects of aging societies in Europe that is being carried out by the World Bank in partnership with client governments, academic and other relevant institutions (see World Bank, 2007, and Gill and Raiser, 2012). There is a large theoretical literature which uses overlapping generations and endogenous growth models to assess the challenges of aging, mostly in terms of the sustainability of public finances (see Meijdam and Verbon, 1997, Crettez and Maitre, 2003, or Börsch-Supan, 2003). In this paper, the issue of aging is approached exclusively from the point of view of its effect on economic growth. This is an empirical study, drawing on econometric panel data specifications in the spirit of Feyrer (2008) in order to isolate the macroeconomic effect of aging on each one of the production factors and to quantify the expected effects on economic growth.

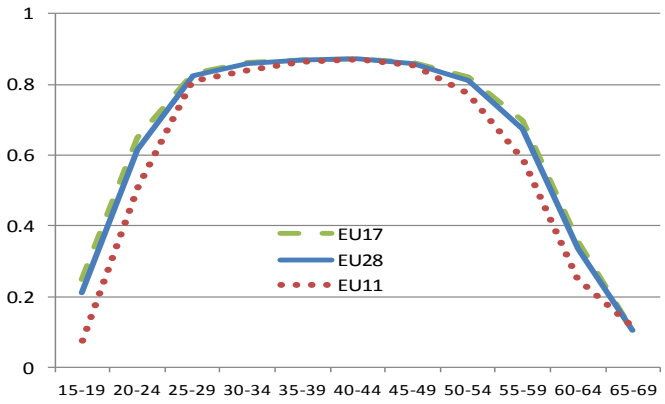
The key findings of the analysis are:

- Aggregated labor force participation rates in the EU11 lag behind those in the EU17 for all age groups. Participation rates by gender and educational attainment are systematically lower in the EU11 and the differences are particularly large for females without tertiary education. Furthermore, over the last decade, there has been a decline in labor participation in the EU11. These differences indicate that from a labor-supply side, the EU11 are in a relatively worse position to face the challenges of aging than the EU17.
- Unless efforts are undertaken to increase participation rates in Europe, in particular for both young and old-age segments, the size of the labor force in the EU is expected to contract drastically in the next forty years. The fall will be particularly sizeable in the EU11, where the number of persons in the labor market is projected to decline by more than 35 percent by 2050 if participation rates by age, gender and educational attainment remain constant at present levels.
- High old-age dependency ratios in Europe have been negatively associated with economic growth performance. This effect seems to be more pronounced in the EU11 than in the EU17.
- The process of aging in Europe is likely to lead to decreases in investment shares in the next decades, with a larger impact in the EU11 than in the EU17.
- Furthermore, innovation and technology adoption activities may also suffer from the aging process, unless further investments in the accumulation of human capital of newcomers to the labor market are carried out.
- By affecting the EU11 more negatively than the EU17 in terms of economic growth, population aging in Europe may jeopardize further income convergence within the EU.

Aging and Labor Supply: Participation and Education in Europe

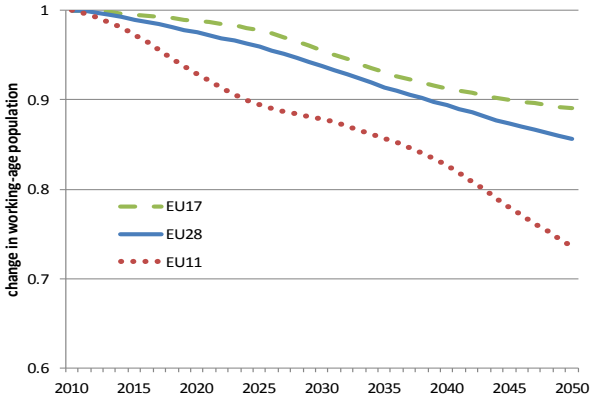
Aggregated labor participation rates are markedly lower in the EU11 than in the EU17 for all age groups (Figure 4). Overall, labor participation in the EU17 and the EU11 countries is very similar for the age group 25-49, but notable differences can be observed for younger and older age groups, where participation is higher in the EU17 groups.[15] The expected shift in the age distribution of European populations described above, coupled with an expected decrease in the working age population (Figure 5) and the differences in participation profiles across the two EU regions considered, suggests that EU11 economies will be more affected by aging than their EU17 counterparts. Unless effective measures to increase labor force participation, in particular at old ages are carried out in the immediate future, overall labor participation rates in the EU11 will remain lower than in the EU17.

Figure 4. Labor Force Participation by Age Group—EU28, EU17, EU11, (in 2011)



Source: Eurostat, 2012, own aggregation.

Figure 5. Working-Age Population Index (Ages 15 to 64, 2010-2050, 2010 = 1)



Source: United Nations, 2011 (medium variant)

Aggregated labor participation rates vary across gender and population segments with different educational attainment. Studying the age profile of participation rates is a first necessary step for unveiling the consequences of population aging in Europe on labor market development. In 2011, 76 percent of the EU population aged 20 to 64 was in the labor force, but only 69 percent of women were participating (Table 1). The participation rate of individuals with tertiary education was

[15] The labor force is a synonym for the economically active population of a country, and is composed of everyone who is either employed or unemployed. Employment (civilian and non-civilian) is defined as any work for pay or profit for at least one hour during the reference week of the labor force survey. In addition, if someone has a formal job attachment but is temporarily not working due to, for example, illness, vacation, or maternity or paternity leave, he/she is counted as being employed. Persons who are not working but available for work and actively looking for jobs are considered to be unemployed. These definitions are in accordance with the definitions of the International Labor Organization (ILO).

87 percent, 15 percentage points higher than that of persons whose maximum attainment was secondary education. While EU11 labor participation rates are systematically lower than those for the EU17 for all working age population groups defined by gender and educational attainment, the size of the differences is very large between individuals with and without tertiary education. The largest differences across country groups are observable for less educated individuals, where labor force participation in the EU11 lags by 5 percentage points for males and by 6 percentage points for females as compared to the EU17.

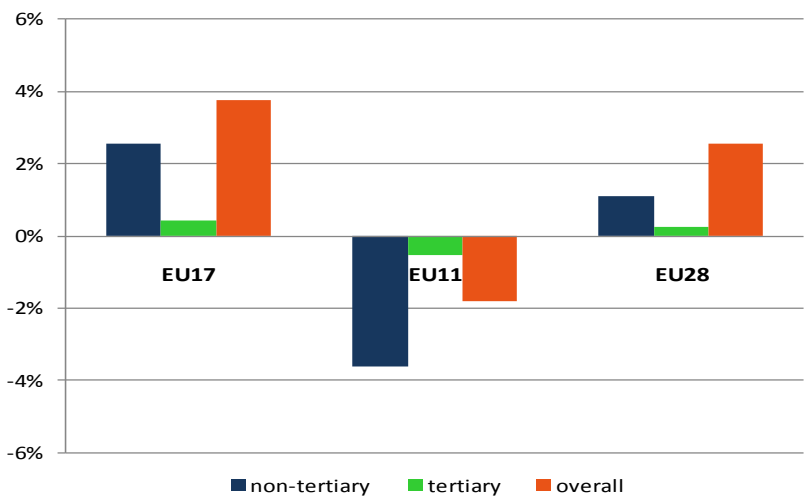
Table 1: Labor Force Participation Rates, Ages 20-64, 2011

	EU28			EU17			EU11		
	Total	**With tert. education**	**No tert. education**	**Total**	**With tert. education**	**No tert. education**	**Total**	**With tert. Education**	**No tert. education**
Males	0.83	0.90	0.80	0.84	0.91	0.81	0.79	0.90	0.76
Females	0.69	0.84	0.63	0.70	0.84	0.65	0.64	0.83	0.59
Total	0.76	0.87	0.72	0.77	0.87	0.73	0.71	0.86	0.68

Source: Eurostat 2012; own calculations

The overall EU28 labor participation rate increased in the last decade. The overall labor force participation rate in the EU28 has experienced an increase of more than 2.5 percentage points over the last decade (2000 to 2011). This boost in participation was driven exclusively by labor dynamics in the EU17 group, and more specifically by increases in female labor force participation. The rate of women without tertiary education went up by almost 5 percentage points and by 1 percentage point for women with tertiary education, while the participation rate for males increased only by 0.7 percentage points.

Figure 6: Change in Labor Force Participation Rates, Percentage Points, Both Genders Combined, Ages 20-64, 2000-11

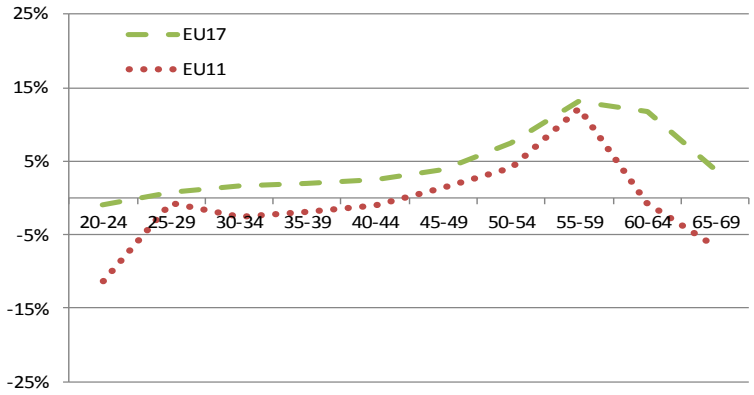


Source: Eurostat, 2012; own calculations

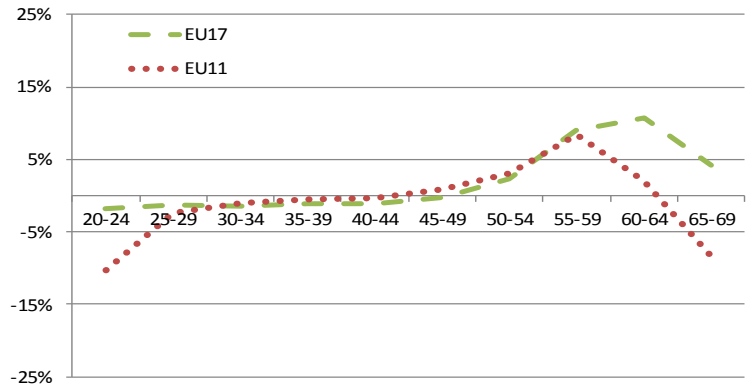
In contrast with the average EU17 trend, labor participation rates in the EU11 fell primarily due to declines in the participation rate of women without tertiary education. The EU11 countries have experienced a fall in participation by approximately 1.8 percentage points in the period 2000-2011 (Figure 6). This fall has been driven by the sizable decrease in the participation rate of individuals without tertiary education, in particular women. The participation rate of women without tertiary education fell in the EU11 by almost 5.3 percentage points in the period 2000-2011 and that of men by 2.6 percentage points. The changes in participation by age group (Figure 7) indicate that the largest decreases in labor force participation in the EU11 have been concentrated in the youngest (20-24) and oldest (65-69) segments of the working population. Although the latter group is quantitatively less relevant, it should be noted that participation has also decreased for individuals aged 20 to 44 for the period 2000-2011. Moreover, the decrease of participation among young women (in the age groups below 45-49) has contributed significantly to the aggregate labor participation changes for the period 2000-2011. The drop in labor force participation rates of women during the transition period has been often documented in the literature. UNIFEM (2006) reports an average decrease of 6.3 percentage points in the labor force participation rate of women for EU11 in the period 1990-2004. Not a single country in the EU11 group has increased female participation rates in the period and the fall in Latvia is as large as 12.7 percentage points, while for the Czech Republic it amounts to 10.3 percentage points. Several explanations have been given for these developments— ranging from the higher cost of raising children after Communism due to the high subsidies to child care prior to transition (Chase, 1995; Gill and Raiser, 2012), to the limited response of labor supply to wage changes (Bicakova et al., 2011).

Figure 7: Change in Labor Force Participation Rates, Percentage Points, by Age and Gender, 2000-11

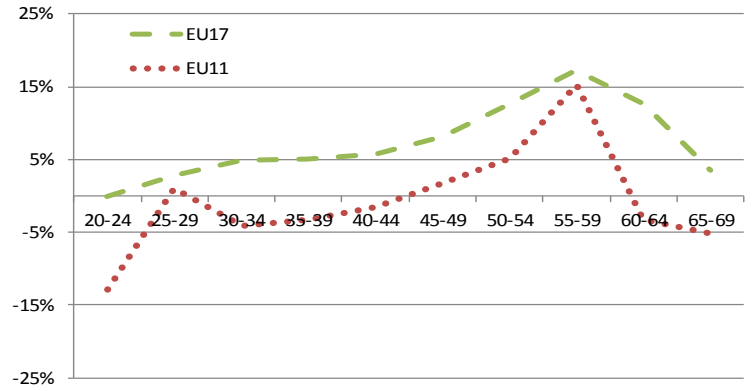
(a) total



(b) males



(c) females



Source: Eurostat, 2012; own calculations

To the extent that participation rates and labor productivity differ between genders, across age groups and educational attainment groups, the expected changes in the age structure of the European workforce will affect economic growth through its effect on the labor input. While these characteristics refer to labor supply effects, from a theoretical perspective these effects are shaped by the degree of substitutability between workers of different ages (see Prskawetz et al., 2008). This degree of substitutability, in turn, determines the age structure component of labor demand. Empirical evidence from the OECD countries shows that, given the relative degree of complementarity of young and old workers, the demand for old workers in Europe is likely to increase as populations age (Feyrer, 2007).

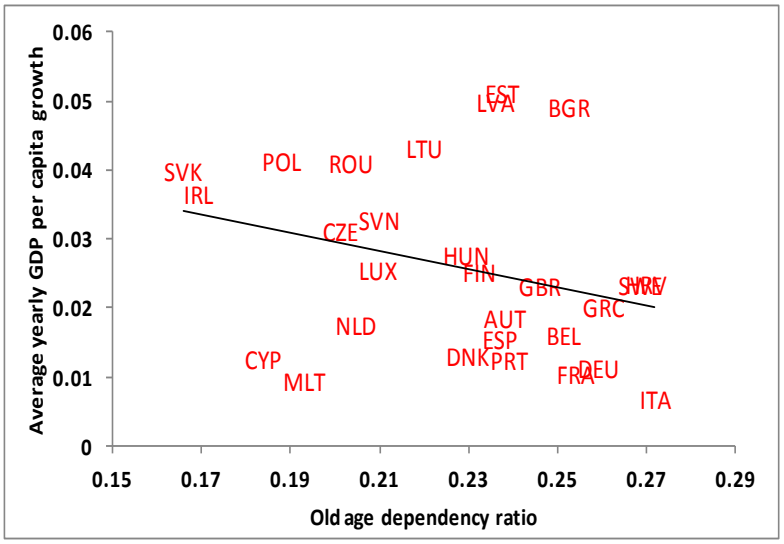
Population aging is also expected to have effects on the composition of labor demand. The expected changes in consumption patterns due to the difference in consumption baskets by age will shift the sector composition of labor demand (see for example the results in Börsch-Supan, 2003, for Germany). If labor market rigidities do not allow such adjustments in employment to take place in an efficient way, the expected decrease in labor force may be accompanied by an increase in unemployment; this would be due to the decrease of demand in the sectors that are affected negatively by the shift in demand due to aging.

With a shrinking labor force and the need for higher labor productivity, an increase in the demand for skilled individuals in the future can be anticipated. This implies that population aging will also have an additional effect on the relative returns to human capital, which in turn may change the human capital accumulation decisions by younger cohorts. The labor productivity of newcomers to the labor market may be expected to improve further as compared to that of older workers.

The theoretical arguments presented above indicate that changes in the age distribution of populations and economic growth are systematically linked through the effects channeled by the labor input. Empirically, several studies find that per capita GDP growth is positively correlated with changes in the relative size of the working age population and negatively correlated with changes in the share of the elderly.[16] Indeed, for the EU28 sample over the last two decades, higher old-age dependency ratios have been on average related to lower income per capita growth (Figure 8). This observation may suggest that there are potential negative effects of population aging on the future economic growth of Europe and, given the differences between the two groups of economies defined by the EU11 and EU17 aggregates, such developments may affect the prospects of further income convergence in the region significantly.

[16] For a review see, for example, IMF (2004).

Figure 8: Income Growth versus Old-Age Dependency Ratio, EU28, Averages for 1992-2010



Source: United Nations, 2011; Penn World Table, 2011.

The overall association between the age structure of the population and economic growth performance in the full sample of EU countries hides a high degree of heterogeneity between the EU11 and the rest of Europe. These differences are likely related to the characteristics of workers (in terms of skills or their distribution across sectors) between the EU11 and EU17 regional groupings. Given that the EU countries have been subject to common shocks after the accession of the Central and East European countries to the EU, inferences based on unconditional correlation such as that presented in Figure 8 may be misleading. Disentangling the net effect of aging on economic growth thus requires the estimation of an empirical model which controls for other relevant growth determinants. In order to unveil the effect of changes in the age structure on economic growth in the sample of EU28 countries, yearly GDP per capita growth is regressed on a set of year dummies and two age structure variables for the working age population, the share of the age group 15-29 on the total population aged 15-64, the share of the age group 50-64 on the total population aged 15-64, as well as the old-age dependency ratio and its square. The effect of changes in the age groups are thus to be interpreted as relative to the age group 30-49.

While the EU17 countries with a relatively young working age population tended to have higher growth rates of income per capita in the period 1992-2011, the increase in the proportion of population in the same age group in the EU11 was associated with a slowdown in economic growth (Table 2). Moreover, some evidence for an inverse U-shaped relationship between the old-age dependency ratio and economic growth can be found in the data, in particular for the EU17 group. Such a result indicates that, although for relatively young populations the aging process may be accompanied by higher growth rates of income, when the old-age dependency ratio is high this effect reverts (or at least, becomes insignificant). Although the effect in this specification is not significant for the EU11 group, it should be noted that the turning point in this link takes place at a lower level of the old-age dependency ratio.

While changes in the labor force share by age group have affected the economic growth performance of the EU28 economies in the last decades, notable differences transpire between the two groups of countries. In contrast to the EU11, increases in the relative size of the younger age groups in the EU17 tended to be significantly associated with a better economic growth performance (Table 2).

Table 2: Age Structure of EU Working-Age Population and Economic Growth, 1992-2011

	EU28	EU17	EU11
Working age, share 15-29	0.123	0.292*	-0.615*
	[0.170]	[0.155]	[0.283]
Working age, share 50-64	0.186	0.0491	0.155
	[0.191]	[0.195]	[0.254]
Old age dependency ratio	2.958*	3.647***	4.668
	[1.658]	[1.199]	[3.553]
Old age dependency ratio squared	-5.064	-6.197**	-12.58
	[3.203]	[2.248]	[7.887]
Turning point of the effect of the old-age dependency ratio	0.292	0.294	0.186
Observations	416	282	134
R-squared	0.623	0.749	0.754
Number of countries	28	17	11
Year fixed effects	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes

Source: Own computations
Note: The dependent variable is GDP per capita growth. Robust standard errors in brackets. *(**)[***] stands for significance at the 10%(5%)[1%] level. Income data are sourced from the Penn World Table (Heston et al. 2012), demographic variables are sourced from EUROSTAT (2012).

Given that the results presented in Table 2 are based on overall population by age group and the estimation is carried out using country fixed effects, the effects unveiled need to be taken with care. Differences in labor force participation and (out)migration (both in the aggregate and by age group) may be driving the results. In addition, the use of aggregate age groups may be masking growth effects that are related to the skill composition of these age groups. If workers with higher skills form younger age groups, the effect of the variable in the regression may be just picking the role of new human capital vintages on economic growth. The panel regression analysis in Table 2 is based on age shares of population groups, but abstracts from issues related to labor participation and differences in skills within age groups. The economic growth experience of European economies can be explained also in terms of differences in the age structure of the labor force (instead of the working age population) by educational attainment, which is the next step taken in this analysis (Table 3).[17]

[17] As in Feyrer (2007), we use instrumental variable estimation to account for the potential endogeneity of participation rates, using working age population proportions as instruments of the labor force variables. Standard tests for the validity of these instruments in our regressions (not shown in the tables) indicate that they are adequate for our specifications. Our results are robust to the exclusion of the years corresponding to the recent financial crisis.

Table 3. Age Structure of the EU Labor Force, Education and Economic Growth, 1992-2011

	EU28	EU17	EU11	EU28	EU17	EU11
Labor force, share 15-29	0.268***	0.429***	-0.0841			
	[0.102]	[0.0908]	[0.212]			
Labor force, share 50-64	0.0483	-0.0783	-0.0284			
	[0.112]	[0.109]	[0.230]			
Labor force, share 15-29 without tertiary educ.				0.194*	0.335***	-0.311
				[0.0994]	[0.109]	[0.224]
Labor force, share 15-29 with tertiary educ.				0.362*	0.0209	0.830*
				[0.217]	[0.239]	[0.450]
Labor force, share 30-49 with tertiary educ.				-0.289**	-0.0335	-0.859***
				[0.135]	[0.113]	[0.231]
Labor force, share 50-64 without tertiary educ.				0.132	0.0193	-0.273
				[0.174]	[0.143]	[0.225]
Labor force, share 50-64 with tertiary educ.				-0.198	-0.0856	0.89
				[0.293]	[0.270]	[0.618]
Log income level	-0.0789***	-0.0938***	-0.197***	-0.0995***	-0.0746**	-0.279***
	[0.0284]	[0.0324]	[0.0713]	[0.0291]	[0.0340]	[0.0730]
Investment rate	0.11	0.0513	0.351***	0.134	0.0822	0.421***
	[0.0837]	[0.0775]	[0.132]	[0.0849]	[0.0735]	[0.132]
Old age dependency ratio	3.076***	1.835*	6.069*	2.638***	1.939*	8.411**
	[1.039]	[1.098]	[3.164]	[0.949]	[1.106]	[3.495]
Old age dependency ratio squared	-5.672***	-3.044	-16.88**	-5.103***	-3.303	-21.66***
	[2.027]	[2.025]	[7.434]	[1.847]	[2.038]	[8.101]
Turning point of the effect of the old-age dependency ratio	0.271	0.301	0.180	0.258	0.294	0.194
Observations	393	270	123	382	261	121
R-squared	0.619	0.728	0.767	0.655	0.746	0.797
Number -of countries	27	16	11	27	16	11
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Source: Own calculations
Note: The dependent variable is GDP per capita growth. All dependent variables are lagged by one year. Robust standard errors in brackets. *(**)[***] stands for significance at the 10%(5%)[1%] level. Instrumental variable estimation used in all columns, using population shares as instrument for the labor force shares. Income and investment data are sourced from the Penn World Table (Heston et al. 2012). Demographic variables are sourced from Eurostat (2012).

As the proportion of the labor force in the younger age group (15-29) reduces, the estimates for EU28 indicate that economic growth is likely to diminish. The estimates (see the first three columns of Table 3 for this specification) confirm the results obtained using overall working age population instead of labor force (Table 2). This effect, however, is not observed on average in the EU11 group, where economies in which reductions in the proportion of young workers took place tended to experience higher growth rates in GDP per capita. The reason for such differences across

regional aggregates is related to the effect of human capital accumulation on economic growth and can be grasped by estimating models using disaggregated age shares by educational attainment. This is done in columns 4 to 6 of Table 3, which present the results of the estimation of the specifications including the shares of workers with and without tertiary education in each one of the age groups.

The largest positive effects of changes in the age structure of the labor force on economic growth for the EU28 are found for the share of young workers with tertiary education. From a theoretical point of view, this effect entails potential differentials of this group in terms of labor productivity and innovation capabilities. Empirically, in the group of EU28, increasing the share of tertiary educated young workers by one percentage point (and reducing by one percentage point the middle age group without tertiary education) increases income growth on average by 0.36 percent.

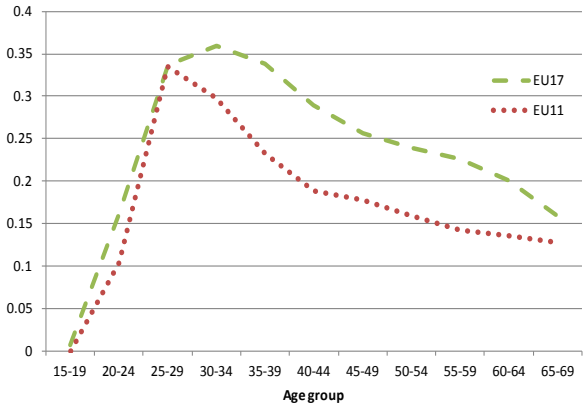
The importance of human capital accumulation in young cohorts of the labor force for economic growth is particularly relevant for the EU11 region (Table 3). The effect of the share of labor force with tertiary education in the young age group is much larger in the EU11 than in the EU17. Each percentage point increase in the share of the tertiary educated of the young age group boosts income growth by 0.8 percent. Notably, this effect is coupled with a negative and significant income growth effect of increasing the share of less-skilled young workers.

Countries where younger workers are better educated than those already in the labor force profit most from the macroeconomic returns to human capital. The negative and significant sign of the proportion of workers aged 30-49 with tertiary education indicates that sustaining high rates of economic growth in Europe requires investments in education for young cohorts that ensure improvements in the skills of newcomers in the labor market over those already in the labor force. Such estimates suggest that the education differential between young and older workers is the key variable explaining differences in economic growth. These growth returns, in turn, diminish as the education gap between these age groups closes. This result could suggest that training older workers may also play an important role as a policy for counteracting the negative effects of aging. Against the backdrop of increases in retirement ages, the importance of lifelong learning in the framework of aging societies should not be underestimated.

The regression results for the EU28 imply an inverted-U shaped relationship between the old age dependency ratio and economic growth, after controlling for other determinants. For the EU28 sample, the negative effects of the age dependency ratio variables are found for values above 27.1 percent, which corresponds to roughly the 90^{th} percentile of the sample. Notwithstanding the considerable degree of heterogeneity across country groups, for EU28 negative effects of high old age dependency ratios are found only for those countries with the highest ratio of population of more than 65 years of age over working age population. The turning point of this effect of aging on economic growth takes place at a similar level of the old age dependency ratio for the EU17 subsample. However, the negative effects for the EU11 group occur for much lower values of the variable: for old age dependency ratios above 18 percent, the 15^{th} percentile of the sample. This suggests that aging is hurting the economic growth process in the EU11 more than in the EU17, and thus may act as a powerful barrier to the equalization of income per capita levels in Europe.

The observed differences in participation rates (across age groups, gender and educational attainment levels) suggest that unless convergence trends in participation and educational attainment take place within the EU28, the macroeconomic effects of aging that are channeled through the labor input may differ significantly in the EU17 and EU11. These differences are intensified by the existing significant gap in educational attainment between the EU11 and EU17 economies (see Figure 9), which tends to be sizable for relatively older age groups.

Figure 9. Proportion of Population with Tertiary Education by Age Group for EU17 and EU11, 2011



Source: Eurostat 2012 based on EU Labor Force Surveys; own calculations.

Given the differences in the participation rate between individuals with and without tertiary educational attainment, until this gap is reduced by the replacement of older workers by young better educated workers, the EU11 economies may find it difficult to achieve convergence in labor force participation rates to the EU17 group. The differences in participation rate by educational attainment and country grouping depicted in Table 1 suggest that developments in the accumulation of human capital (in the form of education) are expected to be an important driving force of convergence in the labor force participation rate in Europe. Furthermore, unless changes in participation rates take place, the demographic changes that Europe is facing may act as an obstacle to further income convergence across EU economies.

In sum, the results presented above indicate that closing the gap in educational attainment between the EU11 and EU17 countries would bring beneficial effects beyond those related to the higher labor force participation of highly skilled individuals. The higher productivity and innovation potential of young workers with higher education appear to be fundamental for fueling income convergence dynamics in the region. The link between closing the gaps in human capital investments between the EU11 and the EU17, and income convergence in Europe, has been emphasized recently in the empirical literature (see Crespo Cuaresma et al., 2012); this analysis suggests that creating incentives for investments in education should be a central pillar in the design of long-term policies to counteract the negative effects of aging on economic growth. Positive income growth effects can be realized in populations where the higher education level of new cohorts entering the labor market will over time replace older cohorts with lower levels of educational attainment. Given the existing differentials between the EU11 and the EU17 in the share of population with tertiary education for young age groups (see Figure 9), the EU11 economies have the opportunity of reaping income growth returns if efforts are dedicated to close the educational attainment gap. The improvements in human capital should not be limited to improving attainment levels, but should also enhance education quality, a factor that has been emphasized as a driver of long-run income convergence for the region in recent literature (see Aghion et al., 2010 and Hanushek and Wössmann, 2007).[18]

[18] Since we use age-structured education data in our analysis, the differences in the quality of education received by different cohorts is at least partly embodied in the effects we find for different age groups. Unfortunately, usable data on education quality which contain enough variation across countries and over time are not available for our sample.

Aging and Physical Capital Accumulation: Are There Life-Cycle Effects?

Changes in the age structures are expected to lead to a reduction in the speed of capital accumulation through a decrease in aggregate savings. In the framework of the assessment of the role played by age structure as a determinant of physical capital investment, understanding the effects of aging on savings and investments is particularly important. Concerning private savings, the standard life-cycle theory predicts that at the individual level the highest savings rate will take place in the mid-life period in anticipation of consumption expenditures during retirement (see, for example, Japelli and Modigliani, 2003). Such regularity would imply that changes in age structures which increase the relative weight of older (retired) individuals should lead to a decrease in aggregate savings, thus reducing the speed of capital accumulation (see, for example, Lindh, 1999).

However, the experience of East Asia during the last half a century, where savings rates increased rapidly during the demographic transition, has led many authors to abandon oversimplified life-cycle theory predictions when it comes to unveiling the effects of age structure changes on savings. Some authors (see Mason, 2005) see the possibility of positive growth effects through changes in the savings behavior as populations age. In particular, Mason (2005) refers to possible second demographic dividend effects as savings increase with the aim of compensating for lower income after retirement in a framework of higher life expectancy. Bloom et al. (2003) present a theoretical foundation to such positive effects of aging on savings by generalizing a standard life-cycle model of savings through the inclusion of changes in longevity. Bloom et al. (2003) find that as longevity rises, the adjustment of the savings behavior to the new equilibrium may lead to higher savings rates at all ages.[19]

Theoretically, aging is likely to translate mechanistically into a gradual rise in the ratio of capital-to-labor (Visco, 2005). The higher capital-to-labor ratio would tend to lower expected returns on investment (and lead to a concomitant decline in longer-term real interest rates).[20] In an environment of declining and aging populations, existing public capital (for example, schools, public infrastructure) may become underutilized to the extent that their use differs among generations. Some authors (see for example Goto, 2002, for the case of Japan) argue that the aging process may lead to an increase in the outflow of foreign direct investment as an alternative to large migration inflows to the aging countries. These effects, among others, are expected to have an impact on (both public and private) savings and investments in aging societies beyond that implied by the mechanisms related to the life cycle theories.

[19] Although some of the arguments put forward refer to the effects of aging on savings (and thus economic growth) through behavioral channels, it should be noted that in our analysis we do not use structural models that may allow us to assess such changes quantitatively. We base our inference on aggregated trends and reduced form specifications and thus concentrate on the linkages implied by historical partial correlations among the variables studied.

[20] It should be noted that while the effect of aging on the capital-to-labor ratio is straightforward, if we concentrate on the physical capital-to-human capital ratio its evolution during the aging process is not obvious.

While the macroeconomic effects of aging on private savings are to a certain extent ambiguous, the *ceteris paribus* effect of aging on public savings is almost unanimously expected to have important negative effects on the sustainability of public finance. Assuming no migration or fertility rise, with fewer active individuals, governments pay out more in health care and pension benefits and collect less in tax revenues, leading to deteriorating fiscal conditions. Rising fiscal deficits (negative public savings) could put the fiscal outlook on an unsustainable trajectory. This is particularly the case in Europe, where actual retirement ages have been decreasing in recent times and the workforce is expected to reduce substantially in the coming decades (Gill and Raiser, 2012). The expected changes in age composition will thus lead to a crowding out of public investment in support of less productive activities (pensions and health expenditures). Unless the prospects of longer lives (and eventually the prospects of less generous social protection systems) lead to substantial increases in private savings rates, this channel will unambiguously have negative effects on capital input of production and hence on the economic growth potential of European economies.

The increasing old age dependency ratio in the EU28 is expected to sizably slow down the pace of capital accumulation. With the aim of quantifying the effects of aging on physical capital investment, the investment share of GDP is regressed on labor force age structure variables, as well as the lagged investment share, the old age dependency ratio and its square. The results (Table 4) give evidence that the aging process has led to significant decreases in investment in Europe. The effect of the age structure of the labor force differs between the two regions and is only robust in EU11, but it tends to imply decreasing investment shares as the age distribution of workers shifts towards older age groups. In the EU11, the old age dependency ratio appears negatively related to investment for values of the ratio above 21 percent.[21] The expected future developments in the old age dependency ratio are thus expected to have sizeable detrimental effects on physical capital accumulation, in particular for the EU11 group.

[21] The inverse-U shaped relationship between old-age dependency ratio and economic growth, as well as its determinants, appears as a stylized fact in the EU data. Further research appears necessary to understand the mechanisms leading to such an empirical conditional correlation.

Table 4: Age Structure and Investment in the EU, 1992-2011

	EU28	EU17	EU11	EU28	EU17	EU11
Labor force, share 15-29	0.13	0.202***	-0.111			
	[0.0803]	[0.0609]	[0.152]			
Labor force, share 50-64	0.0221	0.0547	-0.0987			
	[0.0771]	[0.0666]	[0.243]			
Labor force, share 15-29 without tertiary educ.				0.0721	0.144*	-0.149
				[0.0807]	[0.0774]	[0.194]
Labor force, share 15-29 with tertiary educ.				0.0988	0.115	-0.291
				[0.159]	[0.137]	[0.385]
Labor force, share 30-49 with tertiary educ.				-0.0874	0.0619	-0.316
				[0.0996]	[0.0905]	[0.232]
Labor force, share 50-64 without tertiary educ.				0.108	0.188**	-0.0529
				[0.121]	[0.0916]	[0.231]
Labor force, share 50-64 with tertiary educ.				-0.0381	-0.0415	0.372
				[0.183]	[0.169]	[0.631]
Lagged investment rate	0.738***	0.808***	0.740***	0.743***	0.846***	0.719***
	[0.0479]	[0.0626]	[0.0654]	[0.0475]	[0.0646]	[0.0649]
Old-age dependency ratio	1.276**	0.802	4.819*	1.149*	0.944	8.418**
	[0.623]	[0.598]	[2.682]	[0.591]	[0.582]	[3.505]
Old-age dependency ratio squared	-2.441**	-1.327	-11.47*	-2.248*	-1.612	-19.40**
	[1.234]	[1.131]	[6.143]	[1.166]	[1.108]	[8.051]
Turning point of the effect of the old-age dependency ratio	0.261	0.302	0.210	0.256	0.293	0.217
Observations-	393	270	123	382	261	121
R-squared	0.37	0.511	0.489	0.714	0.793	0.75
Number of countries	27	16	11	27	16	11
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Source: Own computations

Note: The dependent variable is the share of investment on GDP. Robust standard errors in brackets. *(**)[***] stand for significance at the 10%(5%)[1%] level. Instrumental variable estimation used in all columns, using population shares as instrument for the labor force shares. All variables are lagged by one year. Investment data are sourced from the Penn World Table (Heston et al. 2012), demographic variables are sourced from Eurostat, 2012.

Aging and Total Factor Productivity: Innovation and Demographic Change

As differences in the accumulation of human capital cause innovation capabilities to differ across age groups, age structure changes may have a direct effect on technological progress and total factor productivity. Bloom and Williamson (1998), Lindh and Malmberg (1999), Kelley and Schmidt (2005), or Feyrer (2007) are examples of empirical studies showing that there is a strong link between demographic structures and productivity across countries. Skirbekk (2004) finds that skills that are key inputs to innovation—problem solving, learning, and speed—tend to degenerate with age, leading to a population that is less creative and entrepreneurial, thereby reducing growth rates. Evidence concerning the variation of productivity in innovation activities by age is also provided by Lehman (1953), who finds a peak in the age interval 30-40, although some degree of variation can be found across scientific disciplines. If scale effects are present in the research and development (R&D) sector, the size of cohorts should have a significant effect on the creation of new technologies and thus on total factor productivity (see Feyrer, 2008).

It has been demonstrated that the likelihood of innovation depends strongly on the accumulation of human capital (see Benhabib and Spiegel, 1994). At a macroeconomic level, the age structure of educated individuals has been shown to explain differences in income growth through its effect on innovation and technology adoption (see Lutz et al. 2008). While a relatively high proportion of young highly educated workers tends to be related to improvements in total factor productivity through technology innovation, more experienced workers (eventually with educational attainments below tertiary) appear important as catalysts of technology adoption and adaptation.

In addition, to the extent that public investment is a relatively important source of R&D expenditures in Europe, the pressure of increased fiscal burden of aging population may have crowding out effects on R&D-driven innovation. Given that R&D expenditures in the EU11 lag behind those in the rest of the EU,[22] the demographic developments ahead may represent an important obstacle to the innovation potential of the region. The difficulties that EU11 economies have had during the crisis in closing the R&D expenditure gap with the rest of the EU, has been deemed as an important factor hampering further convergence in income (Archibugi and Filippetti, 2011). The additional pressure exercised by the demographic trends may jeopardize income convergence trends within Europe in the future, and calls for the development of economic policy strategies that focus on creating powerful incentives to innovation activities in the region.

In the EU28, labor forces with relative large young age groups, which are dominated by highly skilled workers, tend to be more successful in increasing total factor productivity; the EU11 profit most from these human capital-driven technology adoption and innovation effects. The link between age structure, human capital and total factor productivity is estimated in

[22] The average expenditure on R&D in the EU17 countries for the year 2010 is 2.04 percent of GDP, as compared to 1 percent of GDP on average in the EU11 (see Eurostat, 2012).

the framework of a panel regression model with total factor productivity growth[23] as a dependent variable and the labor force age structure variables by educational attainment as regressors (Table 5). We expand the specification by including the interaction between the shares of tertiary educated labor force by age group interacted with income per capita. Such interaction terms are often used in the literature (see Benhabib and Spiegel, 1994) in order to approximate the technology absorption effects of human capital. The inclusion of interactions with income per capita is able to capture the differences in parameters across the EU11 and EU17 groups, so we estimate this specification exclusively for the full EU28 sample.

Countries with a larger gap to the technology frontier profit most from education in terms of economic growth, since human capital accumulation allows for a more efficient absorption of foreign technologies in domestic production processes. The results of the EU28 estimation support this view. Moreover, investment in human capital accumulation for young cohorts in the EU11 is an important engine of income convergence in Europe. Unless further investments are made in improving the skills of the young cohorts in the labor market, aging will affect the convergence prospects of EU11 negatively also through the innovation and technology adoption channel. This effect is particularly important for those economies at the lower side of the income per capita distribution, where the returns to improving human capital measures appear empirically larger.

[23] We obtain estimates of total factor productivity growth as follows: We use the perpetual inventory method to obtain capital stock estimates, with the depreciation rate assumed to be 6 percent (see Barro and Lee, 2010, for a similar approach) and estimate total factor productivity growth as the residual of a panel regression model where the growth rate of income per capita is regressed against the growth rate of physical capital and the growth rate of the labor force.

Table 5: Age Structure and Total Factor Productivity Growth in the EU, 1992-2011

	EU28	EU28	EU28
Labor force, share 15-29	0.226***		
	[0.0798]		
Labor force, share 30-49	0.0406		
	[0.0827]		
Labor force, share 15-29 without tertiary educ.		0.193***	0.421*
		[0.0721]	[0.219]
Labor force, share 15-29 with tertiary educ.		0.277	54.65**
		[0.178]	[26.35]
Labor force, share 30-49 with tertiary educ.		0.141	0.147
		[0.115]	[0.176]
Labor force, share 50-64 without tertiary educ.		-0.317	58.91
		[0.215]	[41.04]
Labor force, share 50-64 with tertiary educ.		-0.186*	-35.91*
		[0.105]	[19.29]
Log income level	-0.0946***	-0.106***	-0.138**
	[0.0172]	[0.0169]	[0.0574]
Old-age dependency ratio	3.282***	3.039***	-4.497
	[0.728]	[0.692]	[4.096]
Old-age dependency ratio squared	-5.923***	-5.643***	7.701
	[1.412]	[1.332]	[7.359]
Labor force, share 15-29 with tertiary educ. × log income			-5.430**
			[2.635]
Labor force, share 30-49 with tertiary educ. × log income			3.576*
			[1.914]
Labor force, share 50-64 with tertiary educ. × log income			-5.792
			[3.995]
Turning point of the effect of the old-age dependency ratio	0.277	0.269	-
Observations-	386	375	375
R-squared	0.202	0.278	0.66
Number of countries	27	27	27
Year fixed effects	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes

Source: Own computations
Note: The dependent variable is the growth of total factor productivity, obtained as described in the text. Robust standard errors in brackets. *(**)[***] stand for significance at the 10%(5%)[1%] level. Instrumental variable estimation used in all columns, using population shares as instrument for the labor force shares. All explanatory variables are lagged by one year.

The Future(s) of Growth in an Aging Europe

As demonstrated above, population aging in Europe is expected to have effects on economic growth that will create obstacles to further income convergence in the EU unless they are actively counteracted by economic policy. The recent economic growth experience in Europe indicates that shifts in the age distribution of the labor force towards older age groups, as well as high old age dependency ratios, are associated with lower GDP per capita growth. The countries in Europe with high old age dependency ratios also tend to have lower investment shares. Young skilled workers have contributed to total factor productivity (TFP) growth significantly, in particular in the EU11, thus fueling income convergence in the region. Unless economic policy measures are carried out to ameliorate the negative effects of aging, the EU may see its speed of income convergence drastically reduced in future decades.

How will economic growth in the forthcoming decades be affected by aging? Age and skill composition of labor supply is a key element to explain income growth differentials across the EU28 (Table 2, Table 3 and Table 4). A proper assessment of population projections in terms of their implications for economic policy requires that these projections be complemented with labor force projections, so as to assess the size of the economically active population. Since only those in the working age population who are actually active in the labor market are potential contributors to income growth, basing policy advice on figures that do not account for labor force participation may be misleading. In a first step, we define selected scenarios of future labor force participation and educational attainment and show their effect on the size and skill composition of the labor force. In a second step, these labor force projections are combined with the results from the econometric models to estimate effects on investment and income. We take a purely aggregated macroeconomic approach to the assessment of the economic growth effects of aging and abstract from analyzing structural changes related to the sectoral distribution of output, which is also expected to be affected significantly by the aging process in European societies. In particular, we concentrate on the changes in the labor input (by educational attainment) as a driver of income growth in the EU for the future decades.[24]

Four labor force projections are constructed for all EU28 economies over the period 2011-2050 under different sets of assumptions concerning the evolution of participation rates by age, gender and educational attainment level, as well as assumptions about the change in educational attainment by age and gender. These are conditional projections in the sense that population developments (fertility, mortality and net migration assumptions) are taken as given by the UN population projections (medium variant) and several other variables of the model are assumed to follow paths defined by their historical paths. Table 6 presents an overview of the four scenarios, which are defined by the combination of labor force and education expansion scenarios.

[24] If labor input was seen as an undifferentiated input of production, it could be argued that its importance as a factor of production may diminish in the future. We explicitly concentrate on labor input differentiated by educational attainment in order to emphasize the role that innovation and technology adoption play as a driver of long term economic development.

Table 6. Labor Force Participation and Share of the Labor Force with Tertiary Education, by Scenario

Total labor force participation rate (ages 20 to 64)					
		2050			
	2010	BCS+CER	BCS+GET	CPS+CER	CPS+GET
EU17	0.76	0.85	0.86	0.75	0.77
EU11	0.71	0.84	0.85	0.68	0.71
Share of the labor force (ages 20 to 64) with tertiary education					
		2050			
	2010	BCS+CER	BCS+GET	CPS+CER	CPS+GET
EU17	0.25	0.25	0.42	0.25	0.43
EU11	0.18	0.18	0.33	0.18	0.36

Source: Own calculations
Note: BCS: Benchmark convergence scenario; CPS: Constant participation scenario; CER: Constant enrollment rate scenario; GET: Global education trend scenario. See text for descriptions of the scenarios.

The four scenarios combine the following assumptions to compute the labor force projections:

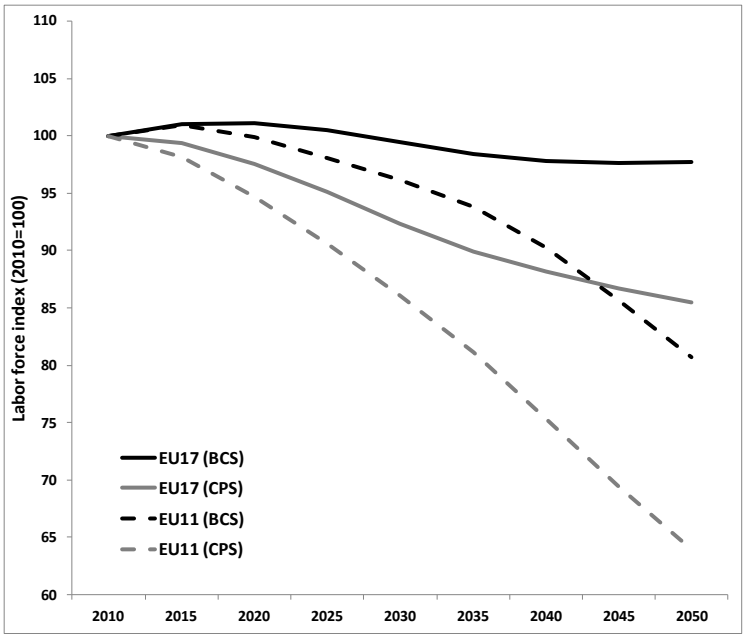
- Labor force participation assumptions: The first scenario, ***constant participation rates scenario*** (CPS), assumes that the country-specific participation rates by age group, gender and educational attainment (with tertiary education versus without tertiary education) of EU28 economies remain constant at the average level observed in the period 2009-2011. The alternative scenario, dubbed ***benchmark convergence scenario*** (BCS), assumes an improvement in labor force participation rates in Europe and imposes that the rates of labor force participation by age group (15-19, …, 60-64), gender and educational attainment level converge in the projection period to those currently (on average for 2009-2011) observed in Sweden, which is the EU28 country with the highest participation rate for all combinations of age, gender and education.[25]
- Educational attainment assumptions: the ***constant enrollment rate scenario*** (CER) retrieves the population by age, gender and educational attainment level for all EU28 countries in the period 2010-2050 under the assumption that enrollment rates remain constant. The alternative assumption, the ***global education trend scenario*** (GET) extrapolates the historical trends observed in the worldwide sample of countries to create paths of educational attainment rates by age and gender for all EU28 countries (see KC et al., 2010). Since average educational attainments have improved at the global level, this scenario assumes further increases in the proportion of population with tertiary education at country-

[25] The share of the total labor force (ages 15-69) that falls in the age group 65-69 in the EU28 comprises 1 percent in 2011 and 2 percent in 2050 (irrespective of the projection scenario). Since the econometric model estimates cover age groups 15-64, projected results for the labor force as well as for investment and income prospects cover ages 60-64 as the highest age group.

specific speeds, which in turn depend on the starting level of attainment. The transition dynamics are approximated using cubic splines, which tend to reproduce past educational expansions satisfactorily (see Lutz et al. 2007 and KC et al. 2010).

Increasing labor force participation rates in Europe, in particular for the EU11, appear as an absolutely necessary (but probably not sufficient) condition to counteract the projected increases in old age dependency ratios. The relatively small differences in participation rate by educational attainment level across the EU28 economies imply that the educational attainment set of scenarios does not lead to strong differences in the overall size of the projected labor force. However, they do lead to dramatic changes in the composition of the labor force by educational attainment and can thus lead to fundamentally different conclusions concerning the effects of aging on economic growth. The changes in participation rate embodied in the BCS scenario, on the other hand, lead to very strong differences in the future size of the labor force in Europe. Assuming no change in participation rates (and constant education enrollment rates), the size of the labor force in the EU17 is expected to fall by approximately 15 percent by 2050, while for the EU11 the fall is extremely dramatic, amounting to almost 36 percent of the labor force in 2010 by the end of the projection period (see Figure 10). Improvements in labor participation (that would lead to the rates observed currently in Sweden for all countries in the EU) would be able to counteract this trend successfully in the EU17, where only very small changes in the size of the labor force would be realized over the next forty years, with a fall that would account for less than 3 percent of its value in 2010. In the case of the EU11, even such radical improvements in labor force participation would not avoid a decrease in the total labor force of roughly 20 percent over the period 2011-2050.

Figure 10. Labor Force Projections for the EU17 and EU11, CPS and BCS Scenarios, 2010-50



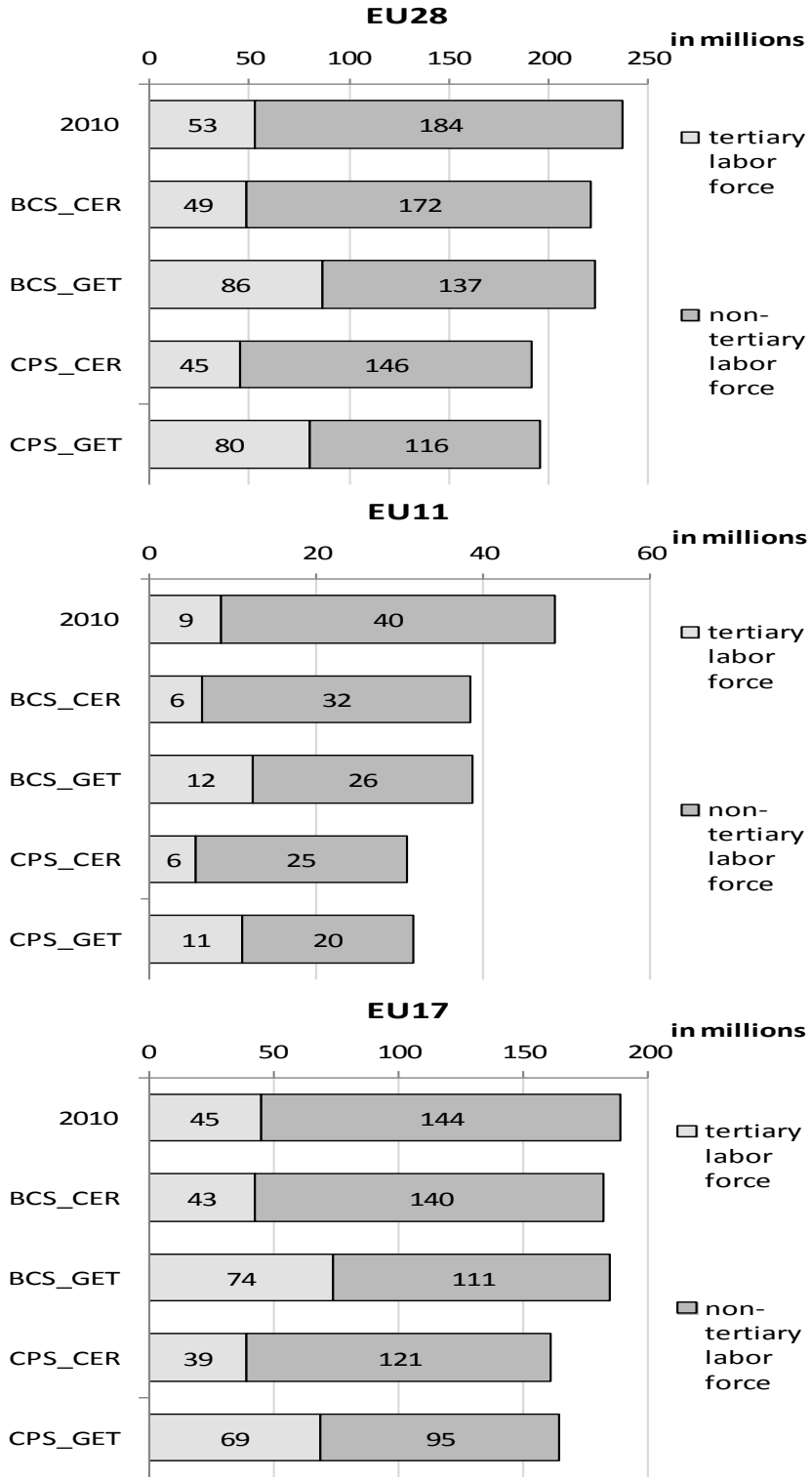
Source: Own calculations
Note: BCS: Benchmark convergence scenario; CPS: Constant participation scenario; CER: Constant enrollment rate scenario; GET: Global education trend scenario. See text for descriptions of the scenarios.

Unless very stark improvements in the pace of productivity growth take place, the projected demographic developments will endanger the growth prospects in the EU28, even if significant positive changes in participation take place in the next decades. This is evident from the expected rapid increase in the old age dependency ratio in Europe, coupled with the range of labor force projections spanned by the two representative scenarios depicted in Figure 10. Adding the educational attainment dimension, the composition of the projected labor force by education of each one of the scenarios defined above may lead to different consequences concerning the potential productivity of workers. Figure 11 presents the composition of the labor force in terms of individuals with tertiary educational attainment in each one of the scenarios (CPS-CER, CPS-GET, BCS-CER and BCS-GET) in 2050. The share of labor force with tertiary education in the total labor force in 2050 for our projections ranges from approximately 16 percent (for CPS-CER in EU11) to 43 percent (for BCS-GET in EU17). Such differences in the dynamics of human capital in the region may lead to substantially different economic growth effects beyond those that are channeled by participation changes. As Figure 11 shows, the two education scenarios lead to only small differences in the overall size of the labor force by 2050 for a given participation scenario.

All scenarios lead to reductions in the investment rate in the period 2030-2050, after a period of very moderate increases in investment rates compared to the recent experience in Europe. Combining the results of the labor force projection scenarios with the econometric models estimated for the investment rate allows us to obtain estimates of the expected change in investment over the coming decades under the assumptions underlying each scenario.[26] The projections presented in Figure 12 quantify the costs of an aging population in terms of its effect on investment shares. The expected increase in investment for the EU11 during the period 2011-2030 is significantly larger than for EU17 in all scenarios, contributing to a continuation of the convergent dynamics in the EU. However, the projected investment shares show that this convergence process breaks in the second part of the period (2030-2050), where the decrease in investment is larger in the EU11 than in the rest of the EU, independent of the scenario used.

[26] We present conservative projections based on the regressions for the EU28 group. We assume that the maximum negative effect of increases in the old age dependency ratio is given by the estimated parameter corresponding to the 95th percentile of the variable in the estimation sample, in order to avoid projections where the quadratic term in the old age dependency ratio leads to extreme negative changes in the investment rate. In this sense, all the projections carried out can be considered fairly optimistic.

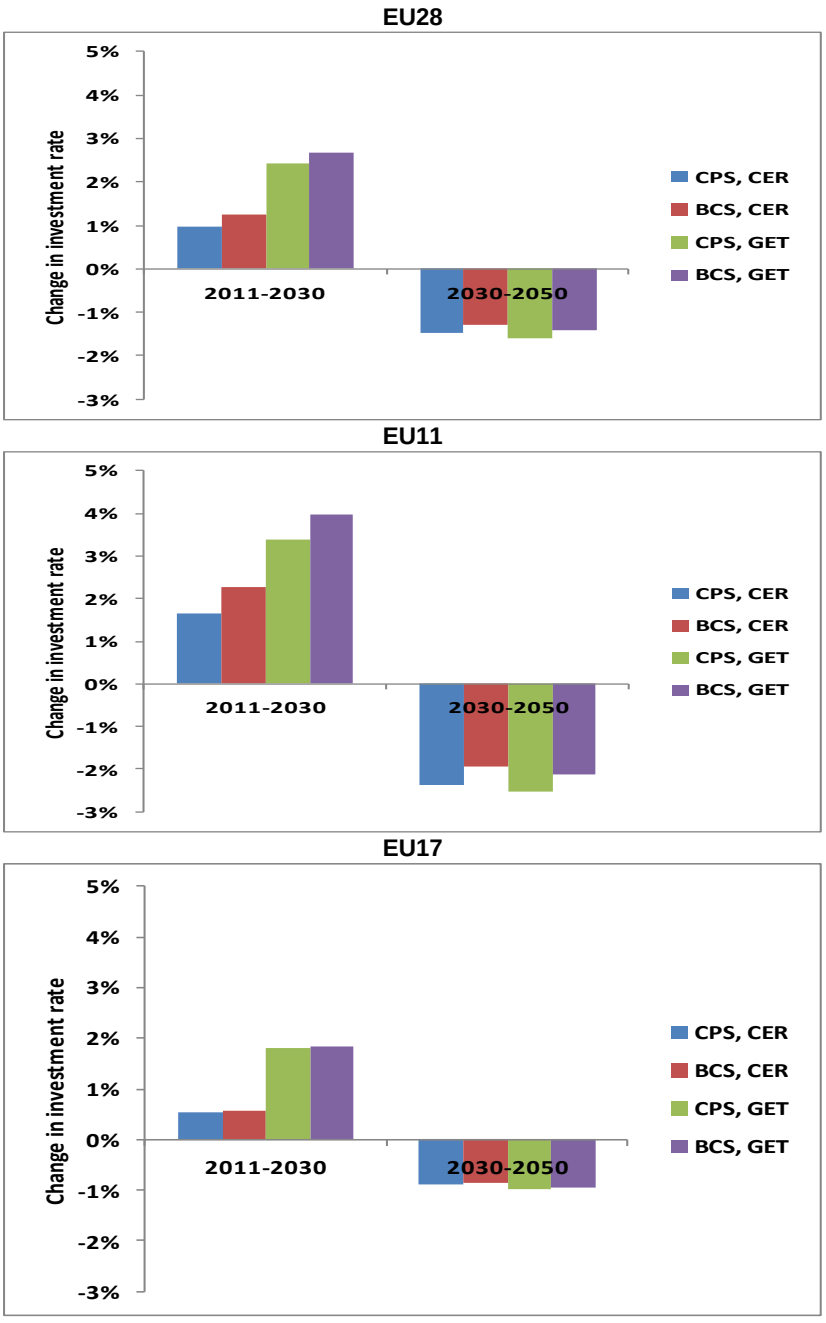
Figure 11. Composition of the Labor Force (ages 15 to 64) by Level of Educational Attainment, 2010 and 2050, by Country Group



Source: Own calculations

The effects of aging on investment are expected to create obstacles to economic growth and income convergence in Europe through their differential negative effect on EU11 economies. Based on the recent historical experience of economic growth in the EU28, even the most optimistic scenarios concerning the development of labor force participation rates and human capital accumulation are not able to avoid decreasing investment shares in the region in the long run (Figure 12).

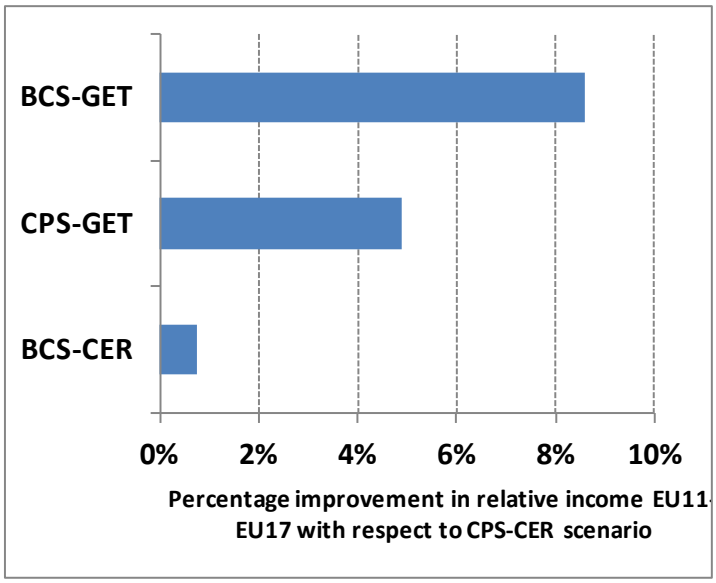
Figure 12. Change in Investment Share in GDP by Projection Scenario



Source: Own calculations

The differences in the extent and timing of the increase in old-age dependency ratios and the changes in the age distribution of labor force participants can contribute to a large slowdown in the income convergence process. Using the labor force participation and educational attainment scenarios described above, we obtain projections of average income per capita growth for the EU11 and EU17 and evaluate the degree of income convergence between the two groups of economies. Figure 13 presents the differences in relative income per-capita of EU11 with respect to EU17 for the different participation and education scenarios as compared to the CPS-CER scenario (the differences are measured in percentage of the relative income in the baseline CPS-CER scenario, which is used for EU17). Given that the estimates in Figure 13 are based on relatively simple models, one should not focus on the specific quantitative effects, but on the relative magnitude among the scenarios. As expected, the largest gains are to be obtained under the BCS-GET scenario. The smaller benefits under the CPS-GET and the BCS-CER scenarios confirm the importance of a simultaneous increase in participation and advances in educational attainment. The simulations indicate that unless appropriate policies to counteract the negative effects of aging on economic growth are pursued, Europe will experience a sizeable slowdown in the process of convergence of income per capital in the coming decades.

Figure 13. Percentage Improvement in Projected Relative Income of EU11 to EU17, with Respect to CPS-CER Scenario, 2050



Source: Own calculations

Policy Implications

Solely improving labor force participation does not appear sufficient to counteract the negative effects of aging on income convergence for the EU11. The results of the income projection presented above indicate that reducing the labor force participation gap between the EU11 and EU17 may help counteract some of the negative implications of aging populations for GDP per capita convergence, but only if it takes place in parallel to a reduction of the educational attainment gap.[27]

[27] See also World Bank (2011) for similar insights concerning the role played by the participation gap.

Improving the skill level of the labor force in the EU11 appears to be a powerful instrument to foster economic growth and further convergence in the EU in the context of aging societies. This conclusion validates the analysis carried out by OECD (2012), which emphasizes the importance of education and improvements in labor productivity to combat the negative effects of aging on income growth for a broad sample of countries. The analysis carried out by the European Commission and the Economic Policy Committee (2012) also underlines that labor productivity developments will be the key driver of income growth in the EU during the coming decades. The results presented in this paper show that EU11 countries with higher shares of young educated workers perform significantly better in terms of GDP per capita growth than those with lower shares. Therefore, taking full advantage of young educated workers and making sure they are integrated into their respective national labor markets in EU11 appears to be one of the most potentially effective ways to counteract the negative effects of aging on economic growth. Overall, creating incentives to extend education for the young and thus improving human capital in the region could become an effective policy response to the challenges posed by demography.

Increasing the retirement age is another way to decrease the negative growth effects of aging. The sizable increase in life expectancy experienced by EU countries in the last decades has not occurred in parallel to an increase in retirement ages (see Gill and Raiser, 2012). On the contrary, since the 1960s, Europeans live significantly longer and retire significantly earlier. Increasing actual retirement ages should thus be considered a central element in the design of policies to counteract the negative consequences of aging for the EU11 economies.

Migration can also contribute to alleviating the costs of aging societies. Making Europe an attractive destination for highly skilled immigrants can provide particularly positive benefits to economic growth. For example, the increased demand for health care may attract migrants to the sector. Projection exercises (see Lutz and Scherbov, 2003) show that the migration flows needed to effectively counteract the increase in old age dependency ratios in the EU are implausibly high. However, these calculations are based purely on head-counts and do not take the skill level of migrants into account. Adding the skill dimension of migrants is a promising area for future research and might lead to less pessimistic growth prospects. This is more so the case since inward net migration to the EU is projected to decelerate in the coming decades (European Commission and Economic Policy Committee, 2012). While migration alone is not expected to solve the problems posed by aging, creating incentives for immigration is to be seen as an important element of the vector of policy responses to counteract some of its negative consequences.

In sum, there is a need for policies to counteract the negative effects of aging. The design of policies aimed at improving the growth prospects of the EU11, in the context of aging populations, needs to recognize the multifaceted nature of this phenomenon. Such policies should focus on increasing the relative size of the highly skilled labor force by creating incentives to human capital accumulation and labor force participation at all ages.

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