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Determinants of Long-Term versus Short-Term Bank Credit in EU Countries

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Abstract

This paper empirically examines the determinants of credit at different maturities across European Union countries during the last decade. The paper documents the lengthening of maturities since the early 2000s, and whether these patterns were driven by similar factors in advanced countries and in emerging market countries. Before the 2008 crisis, long-term credit expanded faster than short-term credit in most countries in the sample, and contracted less than short-term credit after 2008. The paper finds that domestic deposits and foreign liabilities were more important sources of funding in emerging market countries than in advanced countries. Moreover, trade openness and initial banking sector depth matter more for emerging market countries than for advanced countries.

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Determinants of Long-Term versus Short-Term Bank Credit in EU Countries[1]

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1. Introduction

During the last decades, many advanced economies (AEs) and emerging market economies (EMEs) experienced "credit boom-bust cycles" (Terrones et al., 2011). Among EMEs, Central and Eastern European (CEE) developing countries experienced a significant growth of credit after the restructuring of their banking systems and in the run-up to the global financial crisis (Cottarelli et al., 2005; Bakker and Gulde, 2010). Interestingly, in the run-up to the crisis in the EU, the maturity composition of credit to enterprises was also changing. In particular**,** in CEE countries, short-term credit was growing at 21 percent on average annually, while long-term credit was growing at 34 percent.

While the aggregate cyclical patterns of bank credit and the determinants of banking system deepening have been well studied in the literature (Levine, 2005; Djankov et al., 2007; Detragiache and Tressel, 2008; Gozgor 2014), there is little empirical evidence studying the composition of bank credit at different maturities and its determinants in the 2000s. Moreover, even though there are studies that consider the impact of institutional factors on the maturity of bank debt (Qian and Strahan, 2007; Bae and Goyal, 2009), few papers have examined the macroeconomic determinants of the evolution of the maturity composition of bank credit over time. On the other hand, the literature studying the maturity structure of firm financing choices has emphasized the impact of the institutional environment and of financial development on the capital structure of firms (Caprio and Demirguc-Kunt, 1998), and the impact of the financial crisis (Demirguc-Kunt, Martinez Peria and Tressel, 2015).

Studying the determinants of the maturity composition of credit provides a new perspective on economic growth because short-term and long-term loans do not serve the same purpose and

thus may have different impacts on the productive capacity of an economy. For example, it is a well-established fact that firms strive to match the maturity of their assets and liabilities (Hart and Moore, 1995; Rajan and Zingales, 1995; Booth et al, 2001). Short-term credit, which includes commercial paper, lines of credit, and overdrafts, is typically used by firms to finance working capital for a limited period of time, usually less than a year. This type of credit allows firms to finance current expenditures and undertake investments that both take relatively little time to build and generate output relatively fast. In contrast, long-term credit is suitable for fixed investments in plants, machinery and equipment and in high-return projects that require a continuing commitment of capital for years. Those investments take time to complete but may contribute more to long-term productivity growth than short-term investments (Aghion et al., 2005). Hence, a growing importance of long-term credit may indicate that the structure of the banking system is becoming more geared toward financing long-term investments and sustaining economic growth.

The goal of this paper is to determine the factors that drive the growth of short, medium and long-term bank credit to non-financial corporations in EU member countries during the 2003-2014 period, both in advanced countries and emerging countries, and during the pre-crisis and post-crisis periods. We compare the experience of the advanced EU countries to that of emerging EU countries. By comparing EU countries at different income levels, we can mitigate the concerns that the evolution of credit growth was influenced by the evolution of institutional characteristics since institutional country characteristics have generally remained stable during the period studied. The region was nevertheless characterized during this period by the existence of a new currency, the euro, and achieved very high levels of economic and financial integration (Eichengreen and Park, 2003; Laeven and Tressel, 2013). The financial integration supported convergence forces as capital flew from the relatively rich countries to the relatively less developed countries (Abiad,

Leigh and Mody, 2007). However, since the global financial crisis, many countries have experienced reversals of capital flows, and commentators have raised questions on the sustainability of the pre-crisis convergence of income levels. This context provides us with a unique environment to study the evolution of the maturity composition of bank credit when the institutional environment is broadly stable and in the presence of income convergence associated with capital inflows.

We show that, before the crisis, credit growth on average accelerated for all groups of credit maturity (less than one year, one year to five years, above five years) in advanced EU countries and in emerging EU countries. Although there are differences across countries, credit growth was in most countries stronger in the categories of credit with longer maturities, particularly at maturities exceeding 5 years, both in advanced EU countries and in emerging markets of Central and Eastern Europe. After the crisis, credit contracted significantly in both groups of countries. A notable pattern is that long-term credit contracted moderately in advanced economies, while it contracted sharply in emerging market countries.

We find that the cyclical determinants of the growth of credit at different maturities differed significantly between emerging markets and advanced economies in the EU. In the emerging markets of the EU, both domestic funding and foreign funding were significant drivers of bank credit to enterprises at all maturities, and foreign funding was more important to the growth of long-term (above five years) bank credit than that of short-term credit. Countries with less deep banking systems also experienced faster growth of credit with longer-maturities. These patterns of the data suggest that a self-sustaining process of financial deepening and increased use of long-term credit for fixed investments was at play. Credit growth at short and long maturities was also significantly positively associated with the inflation rate and with trade openness, suggesting that

countries with booming demand conditions and with growing links to world trade experienced rapid growth of credit. As the crisis struck, some of these forces reversed. The growth of credit in emerging economies decoupled from the growth of domestic deposits and of foreign funding. It also decoupled from the evolution of trade openness while countries with deeper banking systems experienced a faster decline of short-term bank credit.

In advanced EU countries, the relationship between credit growth and its cyclical determinants was less clear. The growth of deposits and of foreign liabilities was less strongly associated with credit to enterprises at various maturities. There is some indication that the relationship between inflation and initial banking sector depth on the one hand and credit growth on the other hand seemed to remain. There is also evidence that demand conditions – captured by real GDP growth – were a driver of credit growth before the crisis. We next restrict the sample to the so called "periphery" countries of the euro area, which shared with the emerging markets the experience of credit booms and inflows of foreign capital.[2] We find that in these countries, the relationship between credit growth on the one hand and credit funding conditions or initial banking sector depth on the other hand was significant, particularly at shorter maturities. The impact of the global financial crisis was that demand conditions (real GDP growth, inflation) became less significant drivers of credit growth.

The paper is organized as follows: section 2 presents elements of the literature on the determinants of bank credit and its maturity composition. Section 3 describes the data we use in our empirical strategy. Sections 4 and 5 present our empirical specification and results respectively. Finally, section 6 concludes.

[2] The "periphery" countries that we consider are Greece, Ireland, Portugal, Italy and Spain.

2. Literature Review

Our paper is related to two strands of literature. First, it speaks to a growing literature on the determinants of bank credit growth to the private non-financial sector, particularly in EMEs. Guo and Stepayan (2011) find that domestic deposit growth and non-resident liability growth contribute to credit growth. They also find that stronger economic growth, higher inflation, and loose domestic and global monetary policies tend to increase domestic credit availability in the EMEs. Aisen and Franken (2010) show that credit booms prior to the crisis are an important determinant of the credit contraction observed in the aftermath of the crisis. They also find that the degree of financial integration and the type of monetary policy implemented in each country play an important role in explaining bank credit growth. Elekdag and Wu (2011) show that both domestic factors (including domestic monetary policy stances) and external factors (for instance, international interest rates which proxies global liquidity conditions) are the main drivers of credit booms across both advanced and emerging market countries. Mendoza and Terrones (2012) find that most financial crises and domestic credit booms in EMEs have occurred as a result of excessive capital inflows. Lastly, Gozgor (2014) shows that external balances and perceptions of global tail risk affect credit growth.

Our paper is related to the literature studying the determinants of firms' capital structure also provides evidence on the determinants of debt maturity from the perspective of firms' balance sheets. This literature has argued that better institutional frameworks, more developed financial systems and more stable macroeconomic and political conditions are associated with greater use of long-term debt financing by firms (see among others, Caprio and Demirguc-Kunt, 1998; Boone et al., 2001; Demirguc-Kunt and Maksimovic, 1999; Fan, Titman and Twite; 2010).

Our study also speaks to the literature on the effect of laws and institutions on bank loan contracts. Qian and Strahan (2007) find that contracting costs, as measured by legal formalism, shape the terms of bank loans. In countries where legal formalism is high, domestic banks are the main lender to unrated firms. In these environments, loan maturity tends to be longer and the use of collateral tends to be more common. Later, Haselmann, Pistol, and Vig (2010) also report that improving collateral law has a large effect on increasing the supply of credit. In addition, Bae and Goyal (2009) report that banks respond to port enforceability of contracts by reducing loan amounts, shortening loan maturities, and increasing loan spreads. Sufi (2007) finds that third-party certification by rating agencies increases the availability of debt financing for firms since it reduces information asymmetries. Love, Martinez Peria, and Singh (2013) investigate the impact of introducing credit information sharing systems on firm's use of bank loans and their maturity using firm level survey data for more than 75,000 firms in 73 countries over the period 2002–13. They find that the introduction of credit bureaus is associated with increased maturity of bank loans. Gopalan, Mukherjee, and Singh (2014) show that, in India, the establishment of new specialized courts, called debt recovery tribunals (DRTs), to process debt recovery cases, led to financial deepening and increased maturity of bank lending. Tasic and Valev (2008) show that credit maturity is longer in countries with strong institutions, low inflation, large financial markets and better information sharing among banks. Tasic and Valev (2010) explain the share of credit with maturity above one year or above five years by the political and institutional environment, the rate of inflation, the levels of economic and financial development and the establishment of credit information sharing institutions.

Our paper differs from the literature in the sense that the contracting right and property right environment is broadly stable in the sample. All our specifications include country fixed effects that absorb time invariant determinants of bank credit and allow to exclusively exploit variation over time within a country, and the impact of time varying factors on the maturity of bank credit.

3. Data and Summary Statistics

This paper empirically examines the determinants of domestic credit levels across 26 EU countries: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, and Sweden. Our definition of advanced economies and emerging market economies is based on the classification of the IMF.

Table 1 presents the list of the main variables we use as well as the sources of information from which we obtained each variable. We construct quarterly data series for bank credit variables and macroeconomic variables for EU member countries. Data comes from three major sources: ECB Statistical Data Warehouse, the International Financial Statistics (IFS) and Global Financial Stability Report (GFSR). Additional data on institutional characteristics described in Table A2 are from various editions of the World Bank Doing Business database and from the International Country Risk Guide database.

The information on bank credit of different maturities for EU member countries is from the ECB Statistical Data Warehouse, which contains: the total outstanding amount of bank credit to non-financial corporations with maturity of i) less than 1 year; ii) over 1 year and less than 5 years; and iii) over 5 years. We define these three types of loans as short-term, medium-term, and long-term loans, respectively. Credit flows are corrected for break in the series and other

adjustments and represent transactions.[3] The information on other financial and macroeconomic variables was obtained from the International Financial Statistics (IFS) and Global Financial Stability Report (GFSR). Our analysis focuses on the following variables discussed in section 4: banking sector domestic deposits, banking sector foreign liabilities, real GDP, inflation, deposit rate, EONIA rate, trade openness, and credit-to-GDP ratio.

Since information on bank credit is obtained from the ECB, we only observe countries starting from the beginning of the euro, or from the moment they joined the monetary union, turning our panel unbalanced. Table A1 lists the year in which each country is first observed in our data set. For advanced EU countries, the sample period starts in 2003:Q1, but for most emerging European countries, the sample period starts in 2004:Q1. For some of these countries (Croatia, Estonia, Latvia, and Slovenia), bank credit data availability is a greater constraint and the sample only starts in the late-2000s. The sample ends in 2014:Q1.[4] For convenience in exposition, we define the pre-crisis period as the period 2003:Q1-2007:Q4 and the post-crisis period as the period 2008:Q1-2014:Q1.

Figure 1 plots the growth of credit of different maturities in advanced countries and emerging countries. Credit expanded in both advanced countries and emerging countries, but it grew much faster in emerging countries than in advanced countries. An interesting feature is that all three maturity groups expanded at roughly the same rate in advanced countries, but long-term credit expended much faster than short-term credit in emerging countries. Credit stopped growing at the end of 2008, and declined in 2009-2010. While credit was on average growing faster in

[3] Specifically, growth rates are corrected for reclassifications of instruments and other breaks in the series, for valuation changes, and for loan write-offs and write-downs. See ECB (2012) for more details.
[4] For euro area countries, information by maturity on the total amount of loans to non-financial institutions only covers loans within the euro area, and for other euro area countries, it covers domestic loans. In the case of euro area countries, most of loans to non-financial firms are domestic loans.

EMEs, the contraction of credit turned out to be broadly similar in advanced countries and in emerging countries. The contraction of credit was driven by its short-term component (less than one year maturity) and medium-term component (one to five years maturity). A rebound took place in 2011 but it was soon followed by a renewed decline coinciding with the euro area crisis. In contrast, both advanced and emerging EU countries experienced a protracted and mild contraction in the long-term component of credit. The stylized facts suggest that banks first cut short-term credit lines at the onset of the 2008 crisis, followed by medium-term credit. The smoother evolution of the long-term component of credit seems more consistent with an evolution of bank loans aligned with lingering weaknesses in potential output and productivity.

Table 2 provides summary statistics. Panel A provides information on credit growth variables. During the pre-crisis period, the growth of credit was on average broad based, across all three maturity groups. In advanced EU countries, credit to enterprises grew on average at 11 percent, and in emerging EU countries, it grew at 25 percent. As discussed in Bakker and Gröss (2004), some of the former socialist emerging market countries experienced important reforms to their previously state-owned banking sectors during the 1990s, and, after periods of banking crisis, restructured their banking systems and allowed entry of foreign banks. The removal of restrictions on foreign capital in the context of the EU, expectation of these countries joining the Euro Area, and economic convergence contributed in fueling capital inflows, which were associated with a rapid growth of bank credit (Abiad, Leigh and Mody, 2007). As shown in Figure 1, while short, medium and long-term credit were expanding at broadly similar annual rates of 10 to 13 percent in the EU advanced countries on average, longer-term credit in emerging countries of Central and Eastern Europe experienced significantly faster growth than shorter term credit. Specifically, short-term, medium-term and long-term credit grew annually on average at 21 percent, 24 percent

and 35 percent before the crisis. Since the global financial crisis, the average growth of credit to enterprises has been 0.2 percent and 0.4 percent annually in the advanced EU and in the emerging EU countries, respectively. By maturity, the average post-crisis growth of credit was, respectively for advanced EU countries and emerging EU countries, -2.4 percent and -2 percent for short-term credit, 0.2 percent and 1.6 percent for medium-term credit, and 1 and 2.1 percent for long-term credit. During the post-crisis period, the share of long-term credit in total credit remained higher than in the pre-crisis period. In advanced EU countries, it was 49 percent post-crisis and 44 percent pre-crisis on average, and in emerging EU countries, it was 42.6 percent post-crisis and 34.5 percent pre-crisis on average.

Figure 2 shows the pre-crisis and post-crisis credit growth numbers country by country. The stylized fact that longer-term credit grew faster than shorter-term credit is remarkably confirmed at the country level. If we exclude Slovenia, all emerging EU countries but Bulgaria experienced a faster growth of medium-term credit than of short-term credit, and all countries but Slovakia experienced a faster growth of long-term credit than of short-term credit. Turning to the advanced EU economies, about two thirds of the countries also experienced a faster growth of medium-term credit and of long-term credit relative to short-term credit. Thus, a look at the data at the country level shows that the faster growth of longer maturity credit was in fact quite widespread both among advanced EU countries and among emerging countries of Central and Eastern Europe.

Panel B of Table 2 presents summary statistics of our main explanatory variables. Before the crisis, domestic deposits were on average growing at 9 percent and 15 percent in advanced EU countries and in emerging EU countries, while foreign liabilities of banks were growing

respectively at 14 percent and 29 percent.[5] Emerging EU countries were on average more opened to trade (and had an average ratio of trade to GDP of 123 percent) than advanced EU countries (which had an average trade to GDP ratio of 108 percent). They also experienced faster GDP growth (10 percent compared with 5 percent) and higher inflation rates (4 percent compared with 2 percent). Since the crisis, deposit growth has fallen to 2.3 percent and 3 percent respectively in the advanced EU countries and in the emerging EU countries. Foreign liabilities have contracted at 2.5 percent and 2.9 percent respectively in the advanced EU countries and in the emerging EU countries. Trade openness has increased in both groups of countries, suggesting that international trade has recovered faster than domestic activity. The overnight interbank interest rate of the euro area (EONIA), our proxy for global liquidity conditions, has fallen to about 0.4 percent on average since the crisis, compared with about 3 percent during the pre-crisis period, as a consequence of accommodative monetary policy.[6] Lastly, the private sector credit-to-GDP ratio, which proxies the initial banking sector depth, has increased in both groups of countries. The higher ratio after the financial crisis may be because GDP contracted faster than credit, raising the level of the ratio.

4. Methodology

The baseline specification follows recent studies on the determinants of bank credit growth.[7]

$$y_{c,t} = \alpha_0 + \alpha_1\left(Shr^{DEP}{}_{c,t-4} \cdot DEP\_GT_{c,t}\right) + \alpha_2\left(Shr^{NRL}{}_{c,t-4} \cdot NRL\_GT_{c,t}\right) + \alpha_3\pi_{c,t-1}$$
$$+ \alpha_4\Delta GDP_{c,t-1} + \alpha_5 Dep\_Rate_{c,t-1} + \alpha_6 EONIA_{c,t-1} + \alpha_7 trade_{c,t-1}$$
$$+ \alpha_8 depth_{c,t-1} + D_c + u_{c,t}$$

[5] Note that, for euro area countries, the foreign liabilities of banks on national residency basis also include liabilities vis-à-vis the European Central Bank.
[6] We use the EONIA rate instead of the federal funds rate since it is the overnight rate in the European market. However, the EONIA rate and the federal funds rate move closely together.
[7] See for instance Guo and Stepanyan (2011).

In this specification, $y_{c,t}$ refers to bank credit growth (either total, short-term, medium-term or long-term) to non-financial corporations of country *c* during period (quarter-year) *t*. To examine the importance that domestic and foreign funding have on the growth of credit, we include as covariates the deposits growth rate ($DEP\_GT_{c,t}$) and the growth of non-resident liabilities ($NRL\_GT_{c,t}$). We interact the deposit growth rate of a country in a given period by the four-period-lagged share of deposits of the private sector total credit ($Shr^{DEP}{}_{c,t-4}$). Likewise, we interact the growth of non-resident liabilities by the four-period-lagged share of non-resident liabilities to private sector total credit ($Shr^{NRL}{}_{c,t-4}$). As explained by Guo and Stepanyan (2011), weighting the domestic and foreign funding variables by their respective shares helps control for the overall importance of these types of funding within a country.

Since inflation and GDP growth are two direct macroeconomic indicators of aggregate demand and of economic activity affecting the credit growth of a country, we also include the one-period-lagged inflation ($\pi_{c,t-1}$) and GDP growth rate ($\Delta GDP_{c,t-1}$) in our specification. We include in our analysis the one-period lagged deposit rate to account for the impact of monetary conditions through the banking channel. In addition, given that not all EU countries use the EURO as their currency, we include the EONIA rate to adjust for liquidity conditions in Europe. Given that imports and exports of goods and services can also affect credit demand, and thus, domestic credit growth, we further control for openness to trade. In addition, economies that are more open to trade are more vulnerable to the transmission of financial shocks originating in their main trading countries (Aisen and Franken, 2010). Lastly, to control for the overall depth of the banking system, we include the lagged ratio of private sector credit to GDP, which is a standard measure of financial development. We would expect emerging market countries to have faster credit growth since they

might be experiencing financial deepening. To attenuate concerns of reverse causality, we use lagged values for our macroeconomic, trade, financial development and monetary policy variables.

Finally, our specification includes *country level* fixed effects (D_c) to account for other country-specific time unvarying variables that may be related to bank credit growth. For example, the country fixed effects will absorb the impact of slow-moving institutional characteristics on the deepening of the credit markets at different maturities.

In general, we would expect that both domestic and foreign funding (measured by the deposit growth and non-resident liabilities rate) have a positive effect on bank credit, since more domestic deposits or more foreign liabilities may translate in more funds that banks can use to lend to firms. A positive coefficient of inflation may indicate that higher aggregate demand is associated with faster credit growth and will imply that inflation increases nominal bank credit growth. However, a coefficient less than one will indicate that while lagged inflation increases nominal credit growth, it hinders real credit growth (Boyd, Levine, and Smith, 2001). In particular, if the coefficient is less than 1, then inflation will in fact decrease real private credit. Regarding the other macroeconomic and monetary policy variables, we would expect α_4 to be positive since an economy that is growing will in general demands more credit. As with monetary policy (deposit rate), tighter policies should result in lower credit growth.[8] For the EONIA rate, tighter global liquidity conditions should also result in lower credit growth. We expect a positive impact of trade openness on credit growth, as firms will require more external financing when they engage in international trade. This finding would also be consistent with the hypothesis of Rajan and Zingales (2003) that financial development tends to occur when economies are opened up to foreign competition. We expect a negative impact of the initial banking sector depth on credit growth to

[8] As mentioned earlier, we use the deposit rate to proxy for the overall monetary policy stance because not all members of the EU countries use Euro.

the extent that banking sector depth converges to a long-term level consistent with countries' structural socioeconomic characteristics (Čihák, Demirgüç-Kunt, Feyen, and Levine, 2013).

As discussed earlier, our baseline specification includes fixed effects that are expected to absorb the impact of institutional characteristics. This hypothesis is vindicated to the extent that the institutional characteristics that are important for credit growth did not change significantly during the period we study. Table A2 reports various indicators of institutional characteristics that are relevant for bank credit, for 2003 and 2013. Indicators such as rule of law and corporate governance are very stable over time. However, credit bureaus coverage improved significantly (by more than 40 percent) in 8 countries; the indicator of contract enforcement (the number of days to enforce contracts) deteriorated significantly in 8 countries; and the recovery rate improved by more than 20 percent in five countries. To account for these institutional changes, we conduct a series of robustness that we discuss in the next section.

5. Empirical Results

Tables 3-6 present the estimation results from our baseline specification for the period 2003-2014.[9] Table 3 presents the results for all EU countries. The growth of deposits and of foreign liabilities adjusted for their shares in total credit to firms contributes significantly to credit growth at all maturities. These effects are economically very significant. A one standard deviation increase in the deposit variable is associated with an increase in total credit, short-term credit, medium-term credit and long-term credit growth of 1.5, 1.2, 1.1 and 1.3 percentage points respectively. A one standard deviation increase in the foreign liabilities variable is associated with an increase in total credit, short-term credit, medium-term credit and long-term credit growth of 0.8, 0.7, 1.7 and 0.5 percentage points, respectively Higher inflation, which may indicate higher aggregate demand, is

[9] Tables 3-6 present the results without time fixed effects. However, our results are robust to their inclusion.

associated with faster credit growth, particularly for short and long maturities. In contrast, higher deposit rates are associated with slower growth of credit at all maturities, as a higher cost of retail funds translates in higher interest rates on loans to protect lending margins. In contrast, higher interbank rates are associated with faster credit growth of all maturities. This result may indicate reverse causality, as monetary policy rates would normally be higher in periods of stronger aggregate demand and credit booms. Increased openness to trade is associated with faster growth of short-term and medium-term credit, and slower growth of long-term credit, perhaps because international trade tends to require trade finance which is generally geared toward shorter-term maturities (Aisen and Franken, 2010). Last, the growth of credit is slower in countries with deeper banking systems.

Tables 4 and 5 present the empirical estimates for advanced EU countries and emerging EU countries, respectively. In the EU emerging markets, the contributions of the growth of domestic deposits and foreign liabilities to credit growth are much larger than in the advanced EU countries. In particular, the impact of the growth of foreign liabilities is particularly large for long-term credit. The estimated coefficient implies that a one standard deviation increase in the explanatory variable is associated with a 21.6 percentage point increase in long-term credit.[10] This finding suggests that the capital inflows in Central and Eastern Europe played a major role in financing more long-term economic activity. This beneficial effect contrasts with the recent literature that has argued that the capital flows in these countries financed mortgage borrowing by households (Vandenbussche, Vogel, and Detragiache, 2015). It is also worth noticing that the significant positive impact of trade openness on credit growth appears to be concentrated on short-

[10] Studies examining more granular data of bank lending in developing countries also find that expansionary foreign monetary policy translates in higher liabilities among foreign banks, and in turn, in larger and lengthier loans to firms (see Morais, Peydro and Ruiz, 2015).

term credit in emerging EU countries, in line with the hypothesis that it could reflect an increase in trade finance. Last the impact of the initial banking sector depth is stronger in emerging EU countries where the banking systems are generally less deep, and these impacts are stronger for longer maturities. This finding suggests that a "catch-up" process of financial deepening was at play, and was reflected in an increased maturity of bank credit. These effects are economically large. The estimated coefficients imply that a one standard deviation increase in banking sector depth resulted in a faster growth of short-term, medium-term and long-term credit by respectively 1.8, 5.3 and 4 percentage points. This pattern of stronger financial deepening at longer maturities does not appear clearly among the advanced EU countries where both short-term and long-term credit are statistically associated with the initial depth of the banking sector.

Table 6 shows the regressions on the subsample of advanced EU countries that experienced large increases of capital inflows during the pre-crisis period (these countries include Greece, Ireland, Portugal and Spain, to which we add Italy which had large pre-crisis gross external liabilities). At the creation of the euro, these countries had relatively lower GDP per capita than other countries in the monetary union, and thus were expected to experience a neoclassical convergence and capital inflows as exchange rate risk was being removed. We find that for these countries, domestic deposit growth contributed significantly to the growth of credit at all maturities. However, foreign liabilities were significant contributors to the growth of short-term credit to enterprises, in contrast to the experience of the emerging EU countries where foreign funding contributed more to long-term credit. Initial banking sector depth contributes negatively to the growth of short-term and long-term credit, suggesting there is a catch-up process of financial development, while trade openness had, surprisingly, a negative impact on credit growth in these countries.

Tables 7 and 8 present our empirical analysis by differentiating the pre-crisis and post-crisis periods. In these tables, we interact each of the explanatory variables with the post crisis dummy. We present the estimation results separately for advanced EU countries, and for emerging EU countries. Among emerging EU countries, the impact of deposit and foreign liabilities growth on the growth of credit turned out to be much larger before the crisis than previously estimated, and this impact dropped very significantly after the start of the crisis. Hence, while funding conditions of banks seemed to play a crucial role in driving the growth of credit at various maturities before the crisis, and especially for long-term credit, they became economically insignificant once the crisis started. Moreover, aggregate demand pressures – proxied by the CPI inflation rate – were also a strong driver of credit to firms before the crisis, especially at long maturities, but became barely relevant once the crisis started. GDP growth was insignificant in both periods, suggesting that demand factors captured by this variable may be dominated by other forces. Credit growth also became less significantly correlated with trade openness once the crisis started. In advanced EU countries, we observe the same evolution of the correlation between credit growth and the growth of foreign liabilities, while deposit growth became a stronger correlate of credit growth after the crisis, reflecting a stronger association at short maturities. After the crisis, credit growth became more systematically associated with the initial banking depth and with trade openness. But while a clear positive association between real GDP growth and credit growth was observed before the crisis, it became significantly smaller once the crisis started. Thus, our evidence suggests that, since the global financial crisis, the relationship between credit growth on the one hand – especially at long-maturities – and on the other hand, domestic and foreign funding conditions and aggregate demand pressures, has significantly weakened. Given that many countries in our sample experienced significant adjustments of capital flows, this evidence

suggests that these adjustments were not systematically transmitted to credit to enterprises, especially at longer maturities**.** The post-crisis weakening of aggregate demand – as measured by the inflation rate – was also not clearly associated with the evolution of credit to firms. A conjecture consistent with these findings is that, since the start of the global financial crisis, other types of credit – such as credit to households – may have adjusted more systematically with the evolution of funding conditions and of aggregate demand, while credit to enterprises at various maturities may have been affected in a less systematic way.

Several robustness tests were conducted. First, we removed from our baseline specification Latvia and Estonia because the domestic credit cycles in these countries have a volatile structure compared to other emerging countries (Gozgor, 2014). Hence we examine if our main results do not vary when excluding such outlier countries and report our results in Table 9. The exclusion of Latvia and Estonia makes the coefficient on the deposit variable become insignificant. However, all the other variables remain with the same sign and are statistically significant, suggesting that the results are largely robust to excluding these two economies.

Second, in Table 10, we include the real USD GDP (in logs) to control for convergence factors. Other than some minor differences, the main results hold fairly well.

Third, we have shown in the descriptive analysis that, while the institutional environment has remained broadly stable in our sample, some countries have experienced some institutional changes during the period of analysis. We focus on the evolution of two indicators that are known to matter for bank credit and its maturity: the coverage of credit bureaus, as an indicator of transparency and information sharing; the recovery rate in bankruptcy, as an indicator of the efficiency of insolvency regimes.[11] Since our analysis includes country fixed effects, the impact of a country specific

[11] Other indicators – such as the time it takes to enforce contracts, may be endogenous to the economic conditions. For example, the sharp increase in Greece or in Latvia of the number of days to enforce contracts could be an outcome, rather than a causal factor, of the sharp economic crises experienced by these countries.

institutional change that occurred during this period is indeed absorbed by the fixed effects. However, to assess whether specific and large institutional changes impacted credit growth on average, we re-run our baseline regressions by removing the country fixed effects and introducing a dummy variable equal to one if a country experienced a significant institutional change. While this approach is subject to potential omitted variable problems, it allows us to estimate whether the growth of credit at different maturities was systematically different in countries with significant changes in the institutional environment. Results are presented in Tables 11 and 12. While results show that the coefficient for domestic deposits change, our results remain broadly intact.

Lastly, we analyze the specification where the dependent variables are the share of each maturity of credit in total credit to enterprises instead of the credit growth rates in Table 13. This approach allows us to provide evidence on the determinants of the credit shares of each maturity of credit to enterprises. Interestingly, we find that, in the emerging EU countries, the foreign capital inflows contributed in expanding the proportion of credit with long maturities, and in reducing the proportion of credit with short or medium maturities. This finding tends to support the hypothesis that capital inflows were partly driven by economic convergence and helped finance long-term productive investments. The coefficient on the initial banking sector depth variable suggests that long-term credit (respectively short-term credit) tends to expand relatively faster (respectively relatively slower) in countries with deeper banking systems initially. This tends to support the view that financial development and increasing maturities of credit are intrinsically linked. As for the role of monetary policy, a tighter monetary policy seems to impact the share of long-term credit negatively, at the benefit of short-term credit.

6. Conclusion

Policy makers and economists have examined the factors that determine the growth of private sector credit, which plays an important role in economic growth. While the aggregate

cyclical patterns of bank credit and the determinants of banking system deepening have been well studied, there is little empirical evidence studying the composition of bank credit at different maturities and its determinants in the 2000s. Given that short-term and long-term credit play different roles in the financing of economic activity, it is important to understand how the maturity composition of credit to enterprises changes, and to identify the factors that determine the credit of different maturities.

We examine the determinants of the growth of short, medium and long-term bank credit to non-financial corporations in EU member countries during the 2003-2014 period, both in advanced economies and emerging markets, and in the pre-crisis and post-crisis periods. We find that credit expanded for all groups of credit maturity (less than one year, one year to five years, above five years) in EU advanced economies and in EU emerging markets before the crisis. In addition, credit contracted for all groups of credit maturity after the crisis. While the boom-bust cycle appears to be driven by long-term credit in emerging market countries, it seems to have been driven by short-term credit in advanced economies.

We find that the cyclical determinants of the growth of credit at different maturities differed significantly between emerging markets and advanced economies in the EU. In the emerging markets of the EU, foreign funding was one of the most important drives of bank credit to enterprises at all maturities, especially for the growth of long-term (above five years) bank credit. In advanced EU countries, the relationship between credit growth and its cyclical determinants was less clear. The growth of deposits and of foreign liabilities was less associated with credit to enterprises at various maturities.

Our study indicates that foreign capital can be a mixed blessing for many countries. While it can promote financial deepening, in particular longer credit maturities that benefit investment

and help sustain economic growth in recipient countries, it can also be a destabilizing factor if capital flows are too volatile (see also World Bank Group, 2015). As seen from the last decade, the volatility of capital flows can harm their financial systems and real economies by creating short-term booms that eventually lead to crises. Therefore, macro-prudential policies should be implemented to monitor foreign-capital fueled credit booms, which can reverse course very quickly.

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Table 1. Variables and Sources

Variable	Description	Database/Source
Private credit	Credit to enterprises	IFTS, ECB
Short-term credit	Credit to enterprises with maturity up to 1 year	ECB
Medium-term credit	Credit to enterprises with maturity 1-5 years	ECB
Long-term credit	Credit to enterprises with maturity over 5 years	ECB
Foreign liabilities	Liabilities to non-residents/Foreign Liabilities, based on domestic residence for euro area countries	IFTS
Domestic deposits	Transferable/demand deposits; Other/Time and savings deposits, based on domestic residence for euro area countries	IFTS
Inflation	CPI inflation	IFTS
Real GDP	GDP Index, constant local currency	IFTS
EONIA rate	EONIA rate	ECB
Deposit rate	Interest rate on deposits	ECB
Trade openness	Exports plus imports to GDP ratio	IFTS
Private credit to GDP	Credit to the private sector by depository credit institutions to GDP	IFTS

Table 2. Summary Statistics.

	Advanced EU countries			Emerging EU countries		
	Panel A: Dependent Variables					
	# Obs	Mean	SD	# Obs	Mean	SD
All periods						
Growth of total credit	600	0.054	0.095	335	0.096	0.157
Growth of short-term credit	600	0.034	0.124	335	0.068	0.167
Growth of medium-term credit	600	0.064	0.152	335	0.101	0.169
Growth of long-term credit	600	0.061	0.100	335	0.145	0.252
Share of short-term credit	600	0.332	0.147	335	0.325	0.089
Share of medium-term credit	600	0.201	0.061	335	0.280	0.057
Share of long-term credit	600	0.468	0.159	335	0.395	0.079
Pre-crisis period						
Growth of total credit	270	0.110	0.095	121	0.248	0.156
Growth of short-term credit	270	0.096	0.127	121	0.210	0.168
Growth of medium-term credit	270	0.128	0.150	121	0.240	0.165
Growth of long-term credit	270	0.118	0.101	121	0.353	0.304
Share of short-term credit	270	0.363	0.139	121	0.374	0.071
Share of medium-term credit	270	0.193	0.063	121	0.281	0.058
Share of long-term credit	270	0.443	0.160	121	0.345	0.067
Post-crisis period						
Growth of total credit	315	0.002	0.057	206	0.004	0.057
Growth of short-term credit	315	-0.024	0.087	206	-0.020	0.093
Growth of medium-term credit	315	0.002	0.120	206	0.016	0.104
Growth of long-term credit	315	0.010	0.067	206	0.021	0.087
Share of short-term credit	315	0.304	0.148	206	0.295	0.086
Share of medium-term credit	315	0.206	0.058	206	0.279	0.057
Share of long-term credit	315	0.489	0.156	206	0.426	0.071

	Panel B: Independent Variables					
	# Obs	Mean	SD	# Obs	Mean	SD
All periods						
Deposit growth	588	0.055	0.075	318	0.076	0.109
Non-resident liability growth	588	0.050	0.166	318	0.094	0.288
inflation	588	0.019	0.014	318	0.035	0.025
GDP Growth	588	0.026	0.040	318	0.054	0.068
Deposit rate	561	0.891	0.741	300	0.961	0.944
EONIA rate	592	1.626	1.401	322	1.467	1.437
Trade openness	592	1.123	0.722	322	1.293	0.338
Credit-to-GDP ratio	592	5.369	1.980	322	2.253	0.750
Pre-crisis period						
Deposit growth	260	0.093	0.058	113	0.152	0.076
Non-resident liability growth	260	0.140	0.098	113	0.294	0.208
Inflation	260	0.024	0.011	113	0.048	0.028
GDP Growth	260	0.052	0.022	113	0.108	0.047
Deposit rate	234	1.433	0.795	95	1.382	0.939
EONIA rate	264	2.948	0.861	117	3.111	0.852
Trade openness	264	1.082	0.693	117	1.233	0.292
Credit-to-GDP ratio	264	4.630	1.419	117	1.743	0.517
Post-crisis period						
Deposit growth	315	0.023	0.074	197	0.031	0.101
Non-resident liability growth	315	-0.025	0.173	197	-0.029	0.261
Inflation	315	0.015	0.015	197	0.027	0.019
GDP Growth	315	0.006	0.040	197	0.023	0.058
Deposit rate	315	0.462	0.277	197	0.726	0.814
EONIA rate	315	0.454	0.357	197	0.422	0.349
Trade openness	315	1.160	0.745	197	1.335	0.357
Credit-to-GDP ratio	315	5.984	2.171	197	2.557	0.706

Source: Authors' Calculations.

Table 3. Determinants of Bank Credit by Loan Maturity, Full Sample.

	(1) Total	(2) Short-term	(3) Medium-term	(4) Long-term
Deposit growth*shr deposits	0.200***	0.159***	0.144***	0.167***
	[0.027]	[0.035]	[0.047]	[0.037]
Non-res liab growth * shr non-res liab	0.046***	0.041***	0.100***	0.028*
	[0.011]	[0.014]	[0.019]	[0.015]
Lagged Inflation	0.909***	1.810***	0.242	0.665***
	[0.156]	[0.202]	[0.275]	[0.214]
Lagged GDP Growth	0.005	-0.020*	0.003	0.021
	[0.009]	[0.012]	[0.017]	[0.013]
Lagged deposit rate	-0.061***	-0.044***	-0.049***	-0.088***
	[0.006]	[0.008]	[0.010]	[0.008]
Lagged EONIA rate	0.061***	0.052***	0.072***	0.074***
	[0.003]	[0.004]	[0.005]	[0.004]
Lagged trade openness	0.010	0.062**	0.065**	-0.062**
	[0.019]	[0.024]	[0.033]	[0.026]
Lagged credit-GDP	-0.013***	-0.027***	0.001	-0.013**
	[0.004]	[0.005]	[0.007]	[0.005]
Country fixed effect	Yes	Yes	Yes	Yes
Time fixed effect	No	No	No	No
Observations	836	836	836	836
R-squared	0.656	0.561	0.443	0.527
Number of countries	26	26	26	26

Note: Dependent variables are growth rates of total, short-term, medium-term, and long-term credit in EU countries. Standard errors are clustered at the country level. ***, **, * denote significance at 1, 5 and 10 percent levels respectively.

Table 4. Determinants of Bank Credit by Loan Maturity, Advanced EU countries.

	(1) Total	(2) Short-term	(3) Medium-term	(4) Long-term
Deposit growth*shr deposits	0.119***	0.067	0.076	0.030
	[0.029]	[0.042]	[0.059]	[0.029]
Non-res liab growth * shr non-res liab	0.048***	0.043***	0.102***	0.039***
	[0.010]	[0.015]	[0.021]	[0.010]
Lagged Inflation	0.968***	2.490***	1.047**	0.028
	[0.215]	[0.304]	[0.429]	[0.212]
Lagged GDP Growth	0.026	0.016	0.090	0.028
	[0.052]	[0.073]	[0.103]	[0.051]
Lagged deposit rate	-0.039***	-0.008	-0.037**	-0.057***
	[0.009]	[0.012]	[0.017]	[0.008]
Lagged EONIA rate	0.046***	0.029***	0.065***	0.054***
	[0.004]	[0.006]	[0.008]	[0.004]
Lagged trade openness	0.010	0.046	0.023	0.006
	[0.025]	[0.036]	[0.051]	[0.025]
Lagged credit-GDP	-0.014***	-0.033***	0.013	-0.021***
	[0.004]	[0.006]	[0.008]	[0.004]
Country fixed effect	Yes	Yes	Yes	Yes
Time fixed effect	No	No	No	No
Observations	547	547	547	547
R-squared	0.607	0.506	0.416	0.560
Number of countries	15	15	15	15

Note: Dependent variables are growth rates of total, short-term, medium-term, and long-term credit in EU countries. Standard errors are clustered at the country level. ***, **, * denote significance at 1, 5 and 10 percent levels respectively.

Table 5. Determinants of Bank Credit by Loan Maturity, Emerging EU countries.

	(1) Total	(2) Short-term	(3) Medium-term	(4) Long-term
Deposit growth*shr deposits	0.294***	0.256***	0.295***	0.320***
	[0.049]	[0.063]	[0.085]	[0.088]
Non-res liab growth * shr non-res liab	0.524***	0.385***	0.351***	0.751***
	[0.053]	[0.067]	[0.090]	[0.094]
Lagged Inflation	0.743***	0.938***	-0.016	0.910**
	[0.220]	[0.283]	[0.379]	[0.392]
Lagged GDP Growth	0.018*	-0.012	0.005	0.041**
	[0.009]	[0.012]	[0.016]	[0.016]
Lagged deposit rate	-0.038***	-0.033***	-0.038***	-0.057***
	[0.008]	[0.011]	[0.015]	[0.015]
Lagged EONIA rate	0.042***	0.052***	0.050***	0.045***
	[0.005]	[0.006]	[0.008]	[0.009]
Lagged trade openness	0.064**	0.126***	0.081*	-0.024
	[0.026]	[0.033]	[0.045]	[0.046]
Lagged credit-GDP	-0.049***	-0.025**	-0.071***	-0.054***
	[0.010]	[0.013]	[0.017]	[0.018]
Country fixed effect	Yes	Yes	Yes	Yes
Time fixed effect	No	No	No	No
Observations	289	289	289	289
R-squared	0.814	0.715	0.575	0.668
Number of countries	11	11	11	11

Note: Dependent variables are growth rates of total, short-term, medium-term, and long-term credit in EU countries. Standard errors are clustered at the country level. ***, **, * denote significance at 1, 5 and 10 percent levels respectively.

Table 6. Determinants of Bank Credit by Loan Maturity, Periphery of Advanced EU countries.

	(1) Total	(2) Short-term	(3) Medium-term	(4) Long-term
Deposit growth*shr deposits	0.557***	0.542***	0.432***	0.558***
	[0.100]	[0.157]	[0.159]	[0.095]
Non-res liab growth * shr non-res liab	0.169***	0.244***	0.084	0.095**
	[0.041]	[0.064]	[0.065]	[0.039]
Lagged Inflation	0.763**	1.858***	-0.371	0.153
	[0.335]	[0.528]	[0.533]	[0.320]
Lagged GDP Growth	0.083	-0.412	0.649**	0.068
	[0.171]	[0.270]	[0.273]	[0.163]
Lagged deposit rate	0.008	0.027	-0.053	-0.006
	[0.031]	[0.050]	[0.050]	[0.030]
Lagged EONIA rate	0.017	-0.003	0.052***	0.031***
	[0.011]	[0.017]	[0.017]	[0.010]
Lagged trade openness	-0.202***	-0.116	-0.469***	-0.103
	[0.070]	[0.110]	[0.111]	[0.066]
Lagged credit-GDP	-0.019***	-0.047***	-0.007	-0.028***
	[0.007]	[0.011]	[0.011]	[0.007]
Country fixed effect	Yes	Yes	Yes	Yes
Time fixed effect	No	No	No	No
Observations	160	160	160	160
R-squared	0.833	0.685	0.753	0.842
Number of countries	4	4	4	4

Note: Dependent variables are growth rates of total, short-term, medium-term, and long-term credit in EU countries. Standard errors are clustered at the country level. ***, **, * denote significance at 1, 5 and 10 percent levels respectively.

Table 7. Determinants of Bank Credit by Loan Maturity before and after the Crisis, Advanced EU Countries.

	(1) Total	(2) Short-term	(3) Medium-term	(4) Long-term
Deposit growth*shr deposits	-0.191***	-0.118	-0.405***	-0.090
	[0.060]	[0.087]	[0.118]	[0.060]
Non-res liab growth*shr non-res liab	0.124***	0.065**	0.232***	0.108***
	[0.023]	[0.033]	[0.045]	[0.023]
Lagged Inflation	2.471***	3.509***	5.155***	1.473***
	[0.441]	[0.641]	[0.876]	[0.442]
Lagged GDP Growth	1.125***	1.841***	2.103***	0.604***
	[0.192]	[0.279]	[0.381]	[0.193]
Lagged deposit rate	-0.029***	-0.015	-0.014	-0.040***
	[0.009]	[0.014]	[0.019]	[0.009]
Lagged EONIA rate	0.012*	0.027***	-0.001	0.025***
	[0.007]	[0.010]	[0.013]	[0.007]
Lagged trade openness	0.023	-0.006	0.045	-0.023
	[0.033]	[0.048]	[0.066]	[0.033]
Lagged credit-GDP	0.010	-0.020**	0.049***	-0.003
	[0.006]	[0.009]	[0.012]	[0.006]
Postcrisis*Dep gth*shr dep	0.367***	0.298***	0.542***	0.109
	[0.071]	[0.103]	[0.141]	[0.071]
Postcrisis*Non-res liab gth*shr non-res liab	-0.098***	0.000	-0.143***	-0.085***
	[0.027]	[0.040]	[0.055]	[0.028]
Postcrisis*Lagged Inflation	-1.948***	-0.840	-5.611***	-2.080***
	[0.501]	[0.728]	[0.995]	[0.503]
Postcrisis*Lagged GDP Growth	-1.100***	-1.890***	-2.021***	-0.549***
	[0.196]	[0.285]	[0.390]	[0.197]
Postcrisis*Lagged deposit rate	0.026*	0.027	0.091***	0.041***
	[0.014]	[0.020]	[0.027]	[0.014]
Postcrisis*Lagged EONIA rate	0.024***	-0.022*	0.050***	0.014
	[0.009]	[0.013]	[0.018]	[0.009]
Postcrisis*Lagged trade openness	0.011	0.015	0.046**	0.045***
	[0.012]	[0.017]	[0.023]	[0.012]
Postcrisis*Lagged credit-GDP	-0.011***	0.010*	-0.019***	-0.014***
	[0.004]	[0.005]	[0.007]	[0.004]
Country fixed effect	Yes	Yes	Yes	Yes
Time fixed effect	No	No	No	No
Observations	547	547	547	547
R-squared	0.667	0.560	0.511	0.615
Number of countries	15	15	15	15

Note: Dependent variables are growth rates of total, short-term, medium-term, and long-term credit in EU countries. Standard errors are clustered at the country level. ***, **, * denote significance at 1, 5 and 10 percent levels respectively.

Table 8. Determinants of Bank Credit by Loan Maturity before and after the Crisis, Emerging EU Countries.

	(1) Total	(2) Short-term	(3) Medium-term	(4) Long-term
Deposit growth*shr deposits	0.586***	0.549***	0.334**	0.727***
	[0.082]	[0.122]	[0.167]	[0.151]
Non-res liab growth*shr non-res liab	0.941***	0.487***	0.907***	1.620***
	[0.090]	[0.134]	[0.182]	[0.165]
Lagged Inflation	1.275***	0.754*	0.992*	2.450***
	[0.267]	[0.396]	[0.539]	[0.488]
Lagged GDP Growth	0.000	-0.006	-0.009	0.013
	[0.010]	[0.014]	[0.019]	[0.018]
Lagged deposit rate	-0.041***	-0.048***	-0.043**	-0.043***
	[0.009]	[0.013]	[0.018]	[0.016]
Lagged EONIA rate	0.015*	0.022*	0.051***	0.013
	[0.008]	[0.012]	[0.017]	[0.015]
Lagged trade openness	0.150***	0.127**	0.204***	0.165**
	[0.036]	[0.054]	[0.073]	[0.066]
Lagged credit-GDP	-0.059**	0.064*	-0.186***	-0.169***
	[0.023]	[0.034]	[0.047]	[0.042]
Postcrisis*Depgth*shr dep	-0.481***	-0.429***	-0.158	-0.722***
	[0.095]	[0.141]	[0.192]	[0.174]
Postcrisis*Non-res liab gth*shr non-res liab	-0.774***	-0.407**	-0.844***	-1.387***
	[0.112]	[0.167]	[0.227]	[0.205]
Postcrisis*Lagged Inflation	-1.096***	-0.359	-1.398*	-2.342***
	[0.352]	[0.523]	[0.712]	[0.644]
Postcrisis*Lagged GDP Growth	0.019	-0.017	0.002	0.014
	[0.015]	[0.023]	[0.031]	[0.028]
Postcrisis*Lagged deposit rate	0.024***	0.040***	0.020	0.006
	[0.008]	[0.011]	[0.015]	[0.014]
Postcrisis*Lagged EONIA rate	0.027**	0.032*	-0.012	0.040*
	[0.012]	[0.017]	[0.024]	[0.021]
Postcrisis*Lagged trade openness	-0.069***	0.009	-0.123**	-0.147***
	[0.026]	[0.038]	[0.052]	[0.047]
Postcrisis*Lagged credit-GDP	0.039*	-0.065**	0.133***	0.154***
	[0.021]	[0.031]	[0.042]	[0.038]
Country fixed effect	Yes	Yes	Yes	Yes
Time fixed effect	No	No	No	No
Observations	289	289	289	289
R-squared	0.883	0.760	0.629	0.780
Number of countries	11	11	11	11

Note: Dependent variables are growth rates of total, short-term, medium-term, and long-term credit in EU countries. Standard errors are clustered at the country level. ***, **, * denote significance at 1, 5 and 10 percent levels respectively.

Table 9. Determinants of Bank Credit by Loan Maturity, Full Sample without Latvia and Estonia.

	(1) Total	(2) Short-term	(3) Medium-term	(4) Long-term
Deposit growth*shr deposits	0.023	0.018	-0.010	0.012
	[0.014]	[0.017]	[0.024]	[0.018]
Non-res liab growth * shr non-res liab	0.027***	0.037***	0.068***	0.016
	[0.009]	[0.011]	[0.015]	[0.012]
Lagged Inflation	0.898***	1.857***	0.374	0.557**
	[0.169]	[0.207]	[0.287]	[0.223]
Lagged GDP Growth	-0.033***	-0.033***	-0.032*	-0.014
	[0.010]	[0.012]	[0.017]	[0.013]
Lagged deposit rate	-0.053***	-0.038***	-0.041***	-0.082***
	[0.006]	[0.008]	[0.011]	[0.008]
Lagged EONIA rate	0.063***	0.053***	0.074***	0.076***
	[0.003]	[0.004]	[0.005]	[0.004]
Lagged trade openness	0.022	0.089***	0.056	-0.059**
	[0.020]	[0.025]	[0.034]	[0.027]
Lagged credit-GDP	-0.024***	-0.034***	-0.010	-0.021***
	[0.004]	[0.005]	[0.007]	[0.005]
Country fixed effect	Yes	Yes	Yes	Yes
Time fixed effect	No	No	No	No
Observations	823	823	823	823
R-squared	0.628	0.566	0.439	0.519
Number of countries	24	24	24	24

Note: Dependent variables are growth rates of total, short-term, medium-term, and long-term credit in EU countries. Standard errors are clustered at the country level. ***, **, * denote significance at 1, 5 and 10 percent levels respectively.

Table 10. Determinants of Bank Credit by Loan Maturity, Full Sample, Adding Lagged Real GDP.

	(1) Total	(2) Short-term	(3) Medium-term	(4) Long-term
Deposit growth*shr deposits	0.012	0.034**	-0.021	0.001
	[0.013]	[0.017]	[0.023]	[0.018]
Non-res liab growth * shr non-res liab	0.030***	0.031***	0.071***	0.019*
	[0.009]	[0.011]	[0.015]	[0.011]
Lagged Inflation	0.835***	1.799***	0.151	0.649***
	[0.167]	[0.210]	[0.285]	[0.219]
Lagged GDP Growth	-0.022**	-0.052***	-0.020	-0.002
	[0.009]	[0.011]	[0.016]	[0.012]
Lagged deposit rate	-0.054***	-0.038***	-0.041***	-0.082***
	[0.006]	[0.008]	[0.011]	[0.008]
Lagged EONIA rate	0.063***	0.054***	0.074***	0.076***
	[0.003]	[0.004]	[0.005]	[0.004]
Lagged trade openness	0.021	0.085***	0.055	-0.047*
	[0.020]	[0.025]	[0.034]	[0.026]
Lagged credit-GDP	-0.024***	-0.034***	-0.012*	-0.022***
	[0.004]	[0.005]	[0.007]	[0.005]
Lagged real GDP	-0.022	0.003	0.074	-0.094**
	[0.034]	[0.043]	[0.058]	[0.045]
Country fixed effect	Yes	Yes	Yes	Yes
Time fixed effect	No	No	No	No
Observations	851	851	851	851
R-squared	0.622	0.554	0.429	0.516
Number of countries	26	26	26	26

Note: Dependent variables are growth rates of total, short-term, medium-term, and long-term credit in EU countries. Standard errors are clustered at the country level. ***, **, * denote significance at 1, 5 and 10 percent levels respectively.

Table 11. Determinants of Bank Credit by Loan Maturity, Full Sample, Dummy for Credit Bureaus.

	(1) Total	(2) Short-term	(3) Medium-term	(4) Long-term
Deposit growth*shr deposits	0.022	0.039**	-0.013	0.014
	[0.015]	[0.019]	[0.023]	[0.020]
Non-res liab growth * shr non-res liab	0.024**	0.020*	0.060***	0.015
	[0.009]	[0.012]	[0.014]	[0.013]
Lagged Inflation	1.265***	1.789***	0.786***	1.757***
	[0.162]	[0.205]	[0.253]	[0.222]
Lagged GDP Growth	-0.018*	-0.045***	-0.017	0.000
	[0.010]	[0.013]	[0.016]	[0.014]
Lagged deposit rate	-0.031***	-0.029***	-0.026***	-0.044***
	[0.004]	[0.005]	[0.007]	[0.006]
Lagged EONIA rate	0.058***	0.056***	0.066***	0.061***
	[0.003]	[0.003]	[0.004]	[0.004]
Lagged trade openness	0.009*	-0.002	0.013*	-0.019***
	[0.005]	[0.006]	[0.007]	[0.006]
Lagged credit-GDP	-0.003**	-0.003*	-0.003	-0.004**
	[0.001]	[0.002]	[0.002]	[0.002]
Dummy Credit bureaus	0.006	-0.008	0.010	0.019**
	[0.007]	[0.009]	[0.011]	[0.010]
Country fixed effect	No	No	No	No
Time fixed effect	No	No	No	No
Observations	851	851	851	851
R-squared	0.558	0.469	0.402	0.439

Note: Dependent variables are growth rates of total, short-term, medium-term, and long-term credit in EU countries. Standard errors are clustered at the country level. ***, **, * denote significance at 1, 5 and 10 percent levels respectively.

Table 12. Determinants of Bank Credit by Loan Maturity, Full Sample, Dummy for Recovery Rates in Bankruptcy.

	(1) Total	(2) Short-term	(3) Medium-term	(4) Long-term
Deposit growth*shr deposits	0.020	0.039**	-0.016	0.011
	[0.015]	[0.019]	[0.023]	[0.020]
Non-res liab growth * shr non-res liab	0.025***	0.021*	0.064***	0.015
	[0.009]	[0.012]	[0.015]	[0.013]
Lagged Inflation	1.272***	1.716***	0.757***	1.840***
	[0.160]	[0.203]	[0.250]	[0.221]
Lagged GDP Growth	-0.018*	-0.044***	-0.015	-0.000
	[0.010]	[0.013]	[0.016]	[0.014]
Lagged deposit rate	-0.031***	-0.031***	-0.026***	-0.041***
	[0.004]	[0.005]	[0.007]	[0.006]
Lagged EONIA rate	0.058***	0.057***	0.066***	0.059***
	[0.003]	[0.003]	[0.004]	[0.003]
Lagged trade openness	0.008*	-0.001	0.011	-0.020***
	[0.004]	[0.006]	[0.007]	[0.006]
Lagged credit-GDP	-0.004***	-0.003*	-0.005**	-0.006***
	[0.001]	[0.002]	[0.002]	[0.002]
Dummy Recovery Rates	-0.007	-0.012	-0.025**	-0.002
	[0.008]	[0.010]	[0.012]	[0.011]
Country fixed effect	No	No	No	No
Time fixed effect	No	No	No	No
Observations	851	851	851	851
R-squared	0.558	0.470	0.404	0.437

Note: Dependent variables are growth rates of total, short-term, medium-term, and long-term credit in EU countries. Standard errors are clustered at the country level. ***, **, * denote significance at 1, 5 and 10 percent levels respectively.

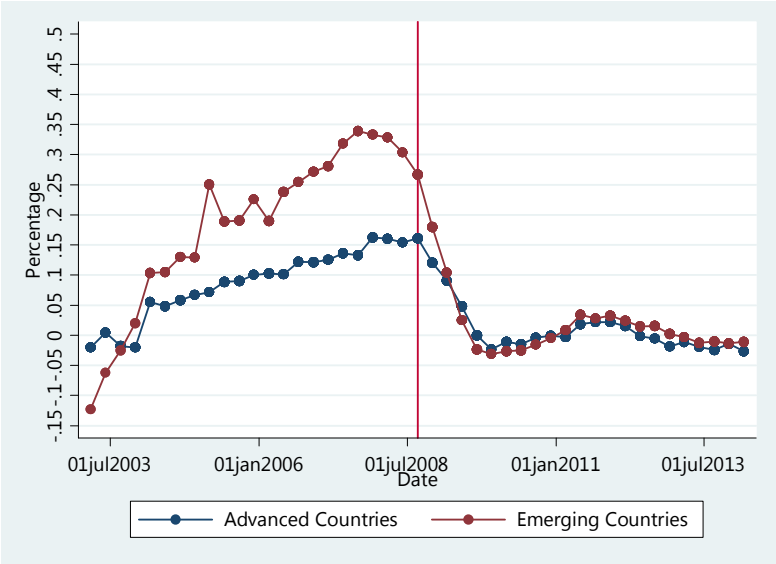
Table 13. Determinants of Bank Credit Shares by Maturity of Loans.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	All EU Countries			Advanced EU Countries			Emerging EU Countries		
	Share of short-term credit	Share of medium-term credit	Share of long-term credit	Share of short-term credit	Share of medium-term credit	Share of long-term credit	Share of short-term credit	Share of medium-term credit	Share of long-term credit
Deposit growth*shr deposits	0.080***	-0.059***	-0.021	0.114***	-0.075***	-0.038**	0.010	-0.016	0.006
	[0.012]	[0.010]	[0.014]	[0.016]	[0.011]	[0.017]	[0.016]	[0.020]	[0.027]
Non-res liab growth * shr non-res liab	-0.007	-0.005	0.012**	-0.009*	0.004	0.006	-0.091***	-0.044**	0.135***
	[0.005]	[0.004]	[0.006]	[0.006]	[0.004]	[0.006]	[0.017]	[0.021]	[0.029]
Lagged Inflation	-0.012	-0.108*	0.120	-0.118	-0.005	0.122	-0.001	-0.102	0.103
	[0.068]	[0.057]	[0.082]	[0.115]	[0.079]	[0.122]	[0.071]	[0.089]	[0.121]
Lagged GDP Growth	-0.003	0.005	-0.002	-0.010	-0.007	0.017	-0.004	0.002	0.002
	[0.004]	[0.003]	[0.005]	[0.028]	[0.019]	[0.029]	[0.003]	[0.004]	[0.005]
Lagged deposit rate	0.003	-0.014***	0.011***	-0.005	-0.029***	0.035***	0.007**	-0.001	-0.006
	[0.003]	[0.002]	[0.003]	[0.005]	[0.003]	[0.005]	[0.003]	[0.003]	[0.005]
Lagged EONIA rate	0.009***	0.008***	-0.016***	0.013***	0.014***	-0.027***	0.014***	0.002	-0.016***
	[0.001]	[0.001]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.003]
Lagged trade openness	-0.024***	0.019***	0.005	-0.036***	0.028***	0.008	-0.013	0.012	0.001
	[0.008]	[0.007]	[0.010]	[0.014]	[0.009]	[0.014]	[0.008]	[0.010]	[0.014]
Lagged credit-GDP	-0.017***	0.005***	0.012***	-0.015***	0.010***	0.006**	-0.015***	-0.019***	0.034***
	[0.002]	[0.001]	[0.002]	[0.002]	[0.002]	[0.002]	[0.003]	[0.004]	[0.005]
Country fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effect	No	No	No	No	No	No	No	No	No
Observations	836	836	836	547	547	547	289	289	289
R-squared	0.458	0.161	0.293	0.479	0.349	0.350	0.520	0.115	0.359
Number of countries	26	26	26	15	15	15	11	11	11

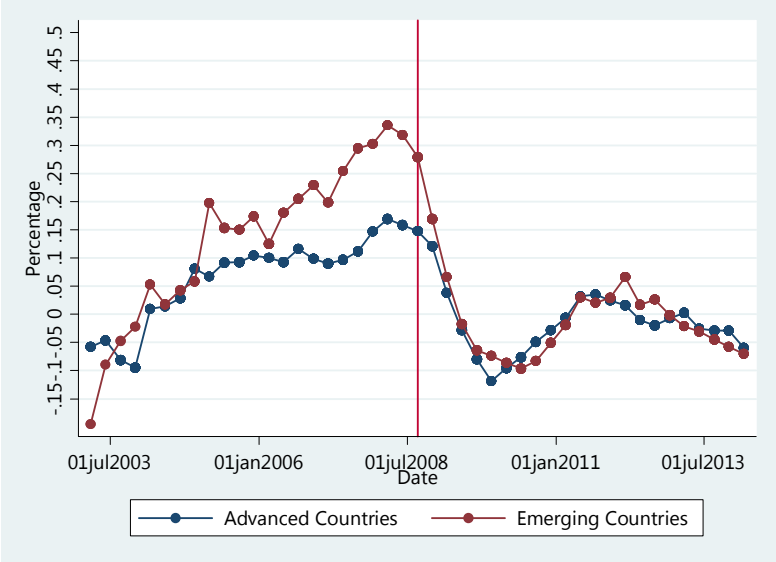
Note: Dependent variables are growth rates of total, short-term, medium-term, and long-term credit in EU countries. Standard errors are clustered at the country level. ***, **, * denote significance at 1, 5 and 10 percent levels respectively.

Figure 1. Evolution of Credit in EU Countries.

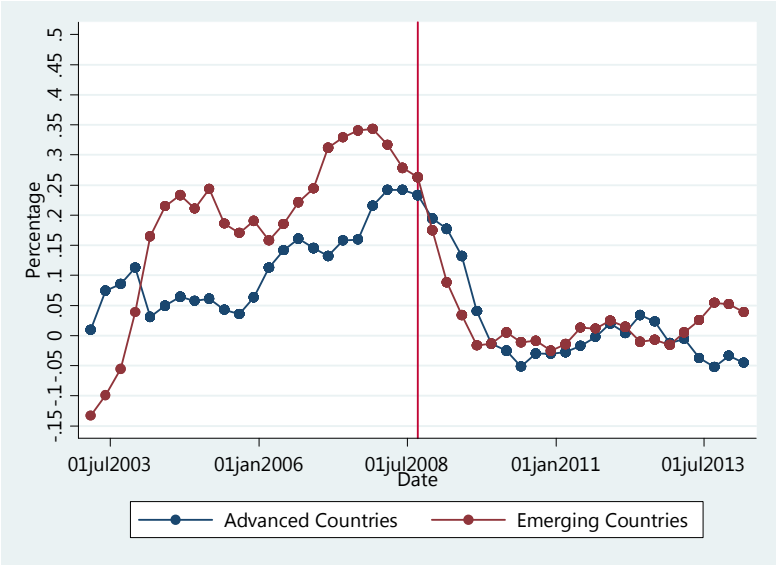
Total Credit



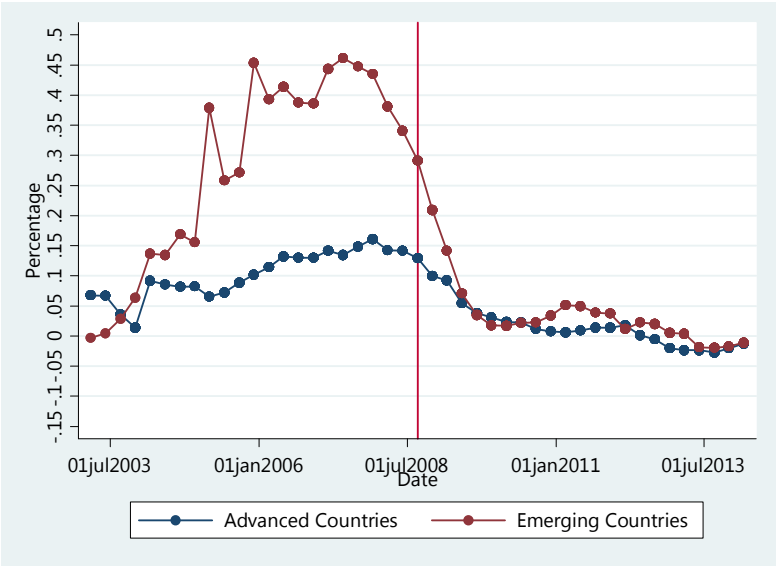
Short-term Credit



Medium-term Credit

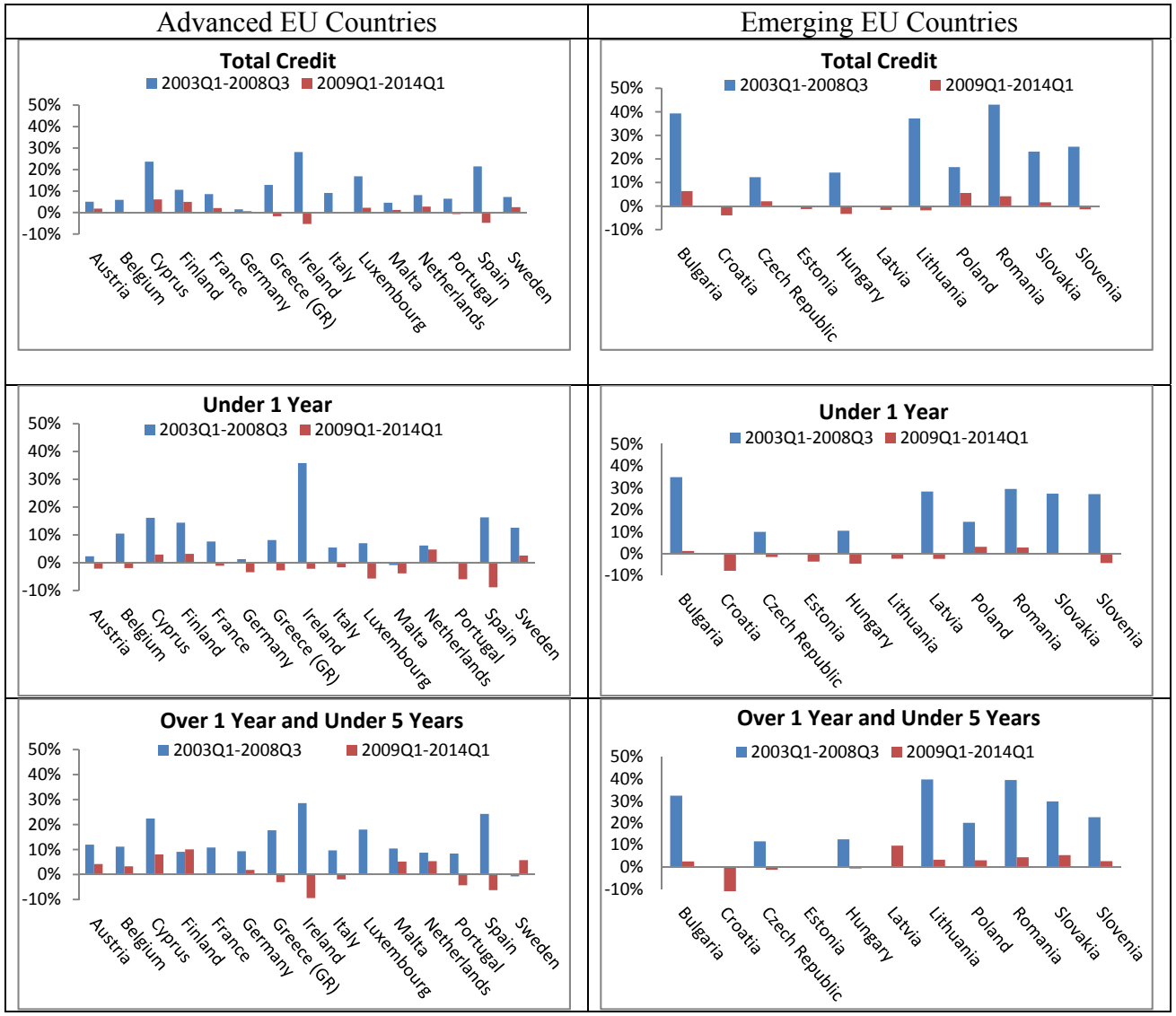


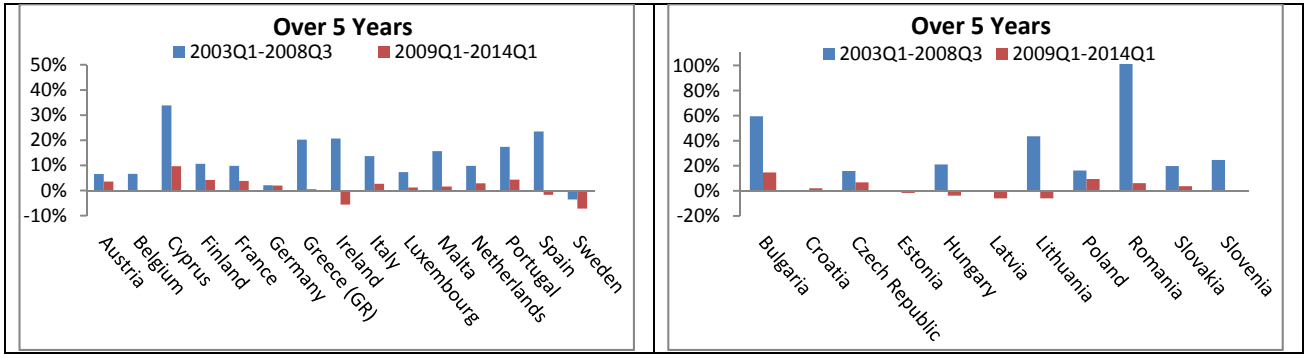
Long-term Credit



Source: ECB Statistical Data Warehouse.

Figure 2. Average Growth of Loans to Non-Financial Corporations in EU Member Countries.





Source: ECB Statistical Data Warehouse.

Appendix

Table A1. Sample of EU Countries.

Non-ECA Countries		ECA Countries	
country	year	country	year
Austria	2003	Bulgaria	2007
Belgium	2003	Croatia	2013
Cyprus	2003	Czech Republic	2004
Denmark*	2003	Estonia	2004
Finland	2003	Hungary	2004
France	2003	Latvia	2004
Germany	2003	Lithuania	2004
Greece	2003	Poland	2004
Ireland	2003	Romania	2007
Italy	2003	Slovakia	2004
Luxembourg	2003	Slovenia	2004
Malta	2003		
Netherlands	2003		
Portugal	2003		
Spain	2003		
Sweden	2003		
United Kingdom*	2003		

Note: * indicates that data from credit to non-financial corporations by maturity missing for this country.

Table A2. Institutional Characteristics.

Country	Rule of law		Contract enforcement (days)		Credit bureaus coverage		Anti-director rights		Recovery rates	
	2003	2013	2003	2013	2005	2013	2003	2013	2003	2013
Austria	6	6	397	397	45	53	5	5	73	82
Belgium	5	5	505	505	0	0	6	6	86	89
Bulgaria	4	2.5	564	564	0	0	2	2	33.5	33.2
Croatia	5	4.5	561	572	0	100	6	6	28.5	30.5
Cyprus	5	5	.	735	0	6.8	.	4	.	70
Czech Republic	5	5	653	511	38	77	5	5	17.8	65.6
Denmark	6	6	380	410	7.7	7.8	5	5	67.2	87.5
Estonia	4	4	425	425	12	34	3	3	39	39.3
Finland	6	6	235	375	14	19	4	4	89	90.2
France	4.5	5	390	395	0	0	3	3	47.5	77.2
Germany	5	5	394	394	88	100	5	5	81.3	83.4
Greece	3	4.5	819	1580	17	82	3	4	45.9	34.3
Hungary	4	4	335	395	4	74	4	4	35.7	40.2
Ireland	6	6	515	650	100	100	6	6	88	87.7
Italy	3	4	1390	1185	60	100	4	4	63.6	62.8
Latvia	5	5	279	469	0	0	4	4	33.9	48.2
Lithuania	4	4	210	300	12	98	4	4	49.8	43.6
Luxembourg	6	6	.	321	0	0	.	4	.	44
Malta	5	5	.	505	0	0	.	6		39.6
Netherlands	6	6	514	514	69	79	4	4	88.4	88.9
Poland	4	4.5	980	685	38	84	2	2	32.1	57
Portugal	5	5	577	547	10	23	5	5	74.7	72.2
Romania	4	3.5	537	512	1	47	5	5	17.5	30.7
Slovakia	4	4	565	545	18	68	4	4	38.6	54.4
Slovenia	4.5	4.5	1350	1270	0	100	8	9	44	50.1
Spain	4.5	5	515	510	6	15	6	6	74.1	71.3
Sweden	6	6	508	321	100	100	4	4	74.9	76.1
United Kingdom	6	5	404	437	76	100	7	7	85.3	88.6

Source: World Bank Development Indicators.