Sandra M. Leitner

Financing constraints and firm growth in the NMS-10 and the Western Balkan countries – a comparative analysis

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Global Development Network Southeast Europe

Financing constraints and firm growth in the NMS-10 and the Western Balkan countries – a comparative analysis

Sandra M. Leitner

Abstract

The paper focuses on Emerging Europe and sheds light on the effects of different types of financing constraints on firm growth – both in terms of sales and employment -, before and after the onset of the global financial crisis. It analyzes and compares a large group of emerging economies, on the one hand (comprising all NMS-10 economies plus Turkey) and the group of economically and financially lagging Western Balkan countries, on the other, and demonstrates that financing constraints significantly obstruct firm growth, with interesting differences across growth indicators, type of financing constraints and economic periods considered. Moreover, it shows that during the pre-crisis period only, financial constraints were more harmful to employment growth of establishments located in the Western Balkans than in the NMS-10. It also highlights that growth is determined by particular establishment characteristics with product innovators or exporters only growing faster while older or larger establishments, importers only or foreign-owned establishments grow more slowly. Finally, it demonstrates that the state of the economy and the particular institutional environment are essential for establishment growth.

Keywords: financing constraints, establishment growth, NMS-10, Western Balkans, financial crisis

JEL Code: L25, D22, D53, O16, O57

1. Introduction

Alarmingly, the burgeoning empirical literature on causes and effects of financial constraints finds considerable and robust evidence that financial constraints severely affect firm behavior, obstruct firm performance and greatly curb firm growth. In particular, financially constrained establishments are found to have significantly lower R&D investment levels, are significantly less likely to penetrate new markets and export, pursue R&D activities, invest in capital goods or offer formal training programs to their employees, to name but a few of the negative consequences.[1]

Theoretically, the presence of financing constraints is ascribed to capital market imperfections like non-negligible information asymmetries between entrepreneurs and uninformed outside investors. For instance, in the model of credit rationing developed by Stiglitz and Weiss (1981), imperfect information induces banks to resort to rationing credits instead of increasing the interest rate to maximize profits. In particular, since the interest rate banks charge for credits also affects the riskiness of their pool of loans through an adverse selection effect and a negative incentive effect, higher interest rates would both attract riskier projects (and therefore result in a 'lemons problem' according to Akerlof, 1970) as well as induce debtors to realize projects with a generally lower probability of success but higher returns when successful (moral hazard). Hence, the on average higher riskiness of potential borrowers lowers overall profits for the banks and induces profit-maximizing banks to restrict the number of credits they grant.

Empirically, a quickly growing body of literature finds strong evidence of financing constraints but also stresses that the prevalence and extent of such constraints strongly depend on very specific firm characteristics. For instance, there is evidence that due to insufficient collateral and resources, smaller firms are more financially constrained than larger ones (see, e.g., Angelini and Generale 2005; Beck et al., 2006; Hadlock and Pierce 2010 or Winker 1999) or that due to the lack of relevant reputation and credit history, younger firms face stronger financing constraints (see, e.g., Beck et al., 2006; Winker, 1999 or Ferrando and Mulier, 2013). Furthermore, probably due to the presence of and easier access to internal capital markets, financing constraints are also lower among foreign-owned firms (see, e.g., Schiantarelli and Sembenelli, 2000 or Beck et al., 2006) or among firms that are part of a business group (see, e.g, Shin and Park, 1999 or Beck et al., 2006). Likewise, preferential treatment from state-owned financial institutions or generous budgetary support from the government also renders state-owned firms less financially constrained (see, e.g., Héricourt and Poncet, 2007). Additionally, empirical evidence also highlights that the macro-economic context matters and points to the decisive role of economic, financial and legal system development in alleviating funding obstacles. In this respect, financing obstacles are found to be lower among firms located in countries with higher levels of financial intermediary development, better stock market development, more efficient legal systems, higher GDP per capita and superior institutional development (Beck et al., 2006). Similar, there is evidence that firms benefit from foreign bank penetration due to easier

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[1] See, e.g., Tiwari et al. (2007) or Mancusi and Vezzulli (2010) for evidence on R&D investment levels, Minetti and Zhu (2011) for evidence on the probability of entering new markets and exporting, Mancusi and Vezzulli (2010), Mohnen et al. (2008), Männasoo and Meriküll (2011), Hajivassilou and Savignac (2008), Álvarez and Crespi (2011) on the probability of pursuing R&D activities, Hasan (2013) on the probability of investing in capital goods or Popov (2013) on the probability of offering formal training programs to employees.

access to credit (see, e.g., Clarke et al., 2001) while bank concentration tends to increase financing obstacles and decrease the probability of receiving bank financing (Beck et al., 2003).

These impediments to external funding are even more important in economically lagging economies, where access to financial markets is not only a crucial determinant of the growth and survival of firms but, more importantly, of economic growth and catching-up processes with richer economies. Hence, in this context, the ensuing analysis sheds light on the prevalence and effects of financing constraints on firm growth for a rich sample of economically lagging economies in Central-, East and Southeast Europe. In particular, it takes a comparative approach and analyzes a large group of emerging economies, on the one hand (comprising all NMS-10 economies[2] plus Turkey) and the group of economically and financially lagging Western Balkan countries[3] on the other. More specifically, it seeks to establish whether financially constrained establishments located in the Western Balkans face stronger financing constraints and, as a consequence, also experience worse growth performances than those located in the NMS-10. Growth is captured in terms of growth of sales but also of employment (of permanent, full-time employees) to also point to potential labor-market consequences of financing constraints. Moreover, it looks at two different types of financing constraints to establish that the effects on performance differ by the relative strictness of prevailing constraints and studies two different economic phases – the pre- and post-crisis periods - to account for the effects of the recent global financial crisis on both funding constraints as well as growth performance.

The results demonstrate that financing constraints significantly hamper firm growth, exact effects however differ by particular growth indicator, type of financing constraint and economic period considered. Furthermore, it highlights that growth-effects of financing constraints differ across regions analyzed: financially constrained establishments located in the Western Balkans show significantly lower employment growth than those located in the NMS-10. This, however, only holds for the pre-crisis period and suggests that prior to the onset of the global financial crisis, financing constraints were more harmful to firm growth in the Western Balkans than the NMS-10. The analysis also points to the importance of particular characteristics for establishment growth and stresses that product innovators or exporters grow faster while older or larger establishments, importers only or foreign-owned establishments show significantly slower growth. Finally, it demonstrates that the state of the economy and the particular institutional environment are essential for establishment growth.

The rest of the paper is structured as follows: section 2 provides an overview of the literature on different barriers to firm growth, with a special focus on financial barriers. A brief overview of pre- and post-crisis economic performances of economies in Central-, East and Southeast Europe on the one hand and their banking sector developments on the other are given in section 3. Section 4 then discusses the data used in the analysis and provides a

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[2] All new Member States comprising Bulgaria (BG), the Czech Republic (CZ), Estonia (EE), Hungary (HU), Latvia (LV), Lithuania (LT), Poland (PL), Romania (RO), Slovakia (SK), Slovenia (SI) but Malta (MT) and Cyprus (CY), and Turkey (TR).
[3] The EU Candidate Countries of the former Yugoslav Republic of Macedonia (MK), Montenegro (ME), Serbia (RS) as well as Albania (AL), Bosnia and Herzegovina (BA), Croatia (HR) and Kosovo (XK).

brief descriptive analysis of cross-country average sales and employment growth experiences of enterprises. The prevalence of and reasons for funding constraints are discussed in detail in section 5 while section 6 presents the methodological approach applied in the analysis. Results of the analysis are then presented and discussed in section 7, separately for sales growth and employment growth while, finally, section 8 summarizes and concludes.

2. Related Literature

Given the key role firm growth plays for employment creation, value-added or knowledge generation or for research and technology-development, it has been high on the policy agenda of developing and developed countries alike and has sparked substantial research on the drivers of and barriers to firm growth. In general, a quickly burgeoning body of literature finds consistent evidence that firms experience non-negligible and partly insurmountable obstacles and barriers which not only inhibit their growth prospects but also affect their chances of survival. In general, the literature identifies numerous internal and external barriers to firm growth.

The role of **financial systems** for fostering growth and the consequences of obstacles and barriers to finance for retarding or altogether stopping growth has received much attention. In general, economists tend to hold different views as to the exact role of the financial sector for growth. While some argue that financial systems play a crucial role in stimulating technological innovation and economic development by mobilizing savings, evaluating projects, managing risk, monitoring managers, and facilitating transactions (see Schumpeter, 1912), others highlight that financial development responds to and therefore follows economic development (e.g., Robinson, 1952 or Lucas, 1988). Empirically, evidence is mounting, corroborating that countries with better developed financial systems also experience faster economic growth (see, e.g., Goldsmith, 1969; King and Levine, 1993; Levine and Zervos, 1998; for a thorough discussion and overview of theoretical arguments and empirical findings see Levine 1997 and 2005). More recently, thanks to the availability of comprehensive and comparable micro-data, cross-country firm-level analyses have come to support the assertion that 'finance matters'. For instance, Demirguc-Kunt and Maksimovic (1998) use firm-level data for 30 developing and developed countries to investigate whether underdeveloped or dysfunctional legal and financial systems prevent firms from investing in growth opportunities. They show that more developed financial systems – as proxied by larger banking sectors and more active and liquid stock markets (but not necessarily larger ones) – allow firms to obtain external funds and to grow faster than they would if they had to finance growth endeavors internally only or through short-term borrowing. Similarly, prevailing funding obstacles are proven to be detrimental to firm growth. For instance, Beck et al. (2005) use a rich sample of developing and transition economies and demonstrate that observable financing obstacles exert a negative and significant effect on firm growth. These effects, however, differ by firm size, affecting smallest firms the most, which is particularly worrying, since SMEs contribute greatly to the overall economy in terms of job creation, knowledge generation and research and innovation performance. Ayyagari et al. (2008) analyze whether, how and to what extent different characteristics of the business

environment firms report as obstacles actually affect their growth performance. They use the World Bank World Business Environment Surveys of 1999 and 2000 for 80 developed and developing economies and show that finance is the most robust obstacle to firm growth, also exerting the largest direct effect on firm growth. However, effects differ by particular firm characteristics, leaving larger firms less affected by finance obstacles than smaller ones. Furthermore, among a number of different financing obstacles like collateral requirements, paperwork and bureaucracy, high interest rates, need for special connections, banks lacking money to lend, access to foreign banks, access to nonbank equity, access to export finance, access to financing for leasing equipment, inadequate credit and financial information on customers, or access to long-term loans, only high interest rates are directly and negatively related to firm growth. In particular, a one-standard deviation increase in this particular obstacle leads to a 3.3 percent decrease in firm growth. Similar negative consequences of funding obstacles are also observable for establishments located in Central East and Southeast Europe. Hashi (2001) uses Albanian enterprise survey data and highlights that financial obstacles significantly hamper growth of Albanian SMEs. Similarly, Hashi and Krasniqi (2011) study two different groups of transition economies, namely a group of advanced transition economies (comprising Poland, Hungary and Czech Republic) and a group of laggard transition economies (comprising Albania, Macedonia and Serbia and Montenegro), to identify differences in growth determinants of SMEs across country groups at different stages of transition. They use the 2002 and 2005 waves of the Business Environment and Enterprise Performance Survey and highlight that external financing constraints only inhibit growth in the group of advanced transition economies, where, given the advanced stage of economic development, establishments can no longer grow using the owners' own funds only but also need external sources of finance. Furthermore, Rajan and Zingales (1998) use industry-level data for 44 economies over the 1980's and various measures of financial development and show that financially dependent industries tend to have better growth performance in more financially developed countries. Similarly, De Serres et al. (2006) test the impact of financial systems' development on sectoral value-added and productivity growth as well as new firm entry in sample of 25 OECD countries. Their findings highlight that policies that improve contract enforcement, access to credit, the efficiency of bankruptcy procedures, or reduce barriers to entry and government control in the banking sector tend to foster labor productivity and value-added growth in sectors most dependent on external finance. Related to that, Aghion et al. (2007) use harmonized firm-level panel data on entry and post entry growth of firms in a sample of 16 OECD, transition, and Latin American countries over the 1990's to shed light on the role of credit constraints for the entry and post entry growth of firms. Their analysis shows that financial development not only spurs new firm entry but also post-entry growth of firms in sectors that more strongly depend on external finance.

In addition to financing obstacles, firm growth is affected by a number of other factors. In particular, specific **demographic characteristics of firms** are found to inhibit their growth prospects and performance. For instance, small firm size or young age tends to speed up growth. The *size-growth nexus* is typically analyzed in the context of Gibrat's law which, in a nutshell, states that firm size and growth are independent. While empirical evidence is rather mixed and generally leads to a rejection of Gibrat's law, most empirical studies find a

negative relationship between firm size and growth (for a comprehensive survey of the literature, see Coad, 2009). Empirical evidence more consistently points to a negative relationship between *age* and firm growth.[4] However, this relationship seems to be nonlinear, eventually disappearing or even reversing after a certain period of time (see, e.g., Coad and Tamvada, 2008; Bigsten and Gebreeyesus, 2007). In a similar vein, an establishment's *legal form and ownership* – as well as changes thereof - matter for its growth. For instance, Harhoff et al. (1998) use a sample of West German firms and highlight that public firms and firms with limited liability have significantly higher growth rates. Furthermore, the growth performance of family-owned businesses as well as changes in growth due to their transfer to successive generations has received a fair amount of interest, both theoretically and empirically. By and large, empirical evidence seems to support the notion that family control exerts a negative impact on firm growth (see, e.g., Gallo et al., 2004; Hamelin and Trojman, 2007; Mahérault, 2004). Likewise, a transfer of family-owned businesses to successive generations tends to result in lower firm growth, at least initially (see Molly et al. (2010) for a sample of Flemish SMEs). In addition, ownership structure and ownership change affect firm growth. Generally, a large amount of empirical evidence finds that due to higher levels of efficiency, better knowledge of and access to global markets, more contacts and networks or better access to financing, foreign ownership is conducive to firm growth (Lipsey et al., 2010; Hake, 2009; Bellak, 2004; Petkova, 2008). Similarly, the analysis of post-takeover firm performance and growth, which mainly attributes positive effects to knowledge-spillovers, produces mixed empirical results.[5] Additionally, a series of theoretical papers emphasizes the key role played by *innovation* for growth (Solow, 1957; Aghion and Howitt, 1992; Romer 1990; Grossman and Helpman, 1994). And while the positive effect of innovation on output growth is well documented in the literature, its role for employment has been subject to extensive debate, particularly since (product and process) innovations both create and destroy jobs, rendering the net effect an, a priori, unclear outcome. This is also reflected in the vast literature on the employment-effects of innovations, which highlights that employment effects of process innovations are mixed and inconclusive[6] while product innovations are associated with employment growth.[7] Moreover, firm growth also critically depends on establishments' *trading activities*. For instance, analyses of European firm-level data highlight that exporting exerts a positive effect on firm employment and sales growth (see, e.g., Wagner, 2002; Serti and Tomasi, 2008).

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[4] For instance, a negative age-growth relationship is found by Dunne et al. (1989) for U.S. establishments, Evans (1987a,b) for U.S. manufacturing firms, Variyam and Kraybill (1992) for U.S. manufacturing and services firms, Sleuwaegen and Goedhuys (2002) for Ivorian manufacturing firms, Geroski and Gugler (2004) for large European companies or Dollar et al. (2005) for Bangladesh, China, India and Pakistan.

[5] See, e.g., Canyon et al (2002), Girma et al. (2006, 2007) or Lipsey et al. (2010) for a positive effect and Köke (2001), Ravenscraft and Scherer (1987), Hake (2010) for a negative effect on firm performance.

[6] Specifically, positive effects are found by Smolny (1998), Lachenmaier and Rottmann (2006) and Becker and Egger (2007) for West German firms or Garcia et al. (2002) for a set of Spanish firms. In contrast, Ross and Zimmermann (1993) in their study on German manufacturing firms point to the destructive effect of process innovations while Van Reenen (1997) for UK manufacturing firms, Rottmann and Ruschinski (1998) for West German firms or Hall et al. (2008) for a panel of Italian firms are unable to detect any significant effect of process innovations on firm-level employment at all.

[7] See, e.g., Van Reenen (1997), Smolny (1998), Rottmann and Ruschinski (1998), Lachenmaier and Rottmann (2006), Ross and Zimmermann (2008), Piva and Vivarelli (2005), Hall et al. (2008) or Harrison et al. (2014).

Likewise, empirical evidence highlights that **individual entrepreneur characteristics** also strongly matter for firm growth. In this respect, an entrepreneur's level of education, years of working experience or gender are highlighted in the literature. In particular, as a source of technical, managerial or business knowledge and skills or enhanced learning capacities, (formal) education is expected to spur firm growth. By and large, this positive *education-growth* nexus is corroborated by empirical evidence (Nichter and Goldmark, 2009). Furthermore, theoretically, *work experience* is expected to be growth-enhancing since learning-on-the-job is a vital mechanism to enhance the capabilities, knowledge and skills of both owners and employees, therefore contributing to firm growth. However, empirical evidence is rather mixed (particularly for developed countries) (for an overview of the literature, see Nichter and Goldmark, 2009) and in some cases even negative, suggesting that more and longer work experience in a sector may even result in slower firm growth (Storey, 1994). Furthermore, because of particularly difficult challenges faced by *women* in terms of, for instance, asymmetrical rights and obligations or greater problems with innumeracy, illiteracy, and a lack of business skills (Nichter and Goldmark, 2009), female-headed establishments tend to grow slower (for a survey of the literature on female entrepreneurship in developing countries see Mead and Liedholm, 1998; McPherson, 1996; Coad and Tamvada, 2008).

Finally, it is widely recognized that the **external environment** plays a crucial role for firm growth. On the one hand, the *state of the economy* directly determines profitable business opportunities, rendering economic upturns periods of strong demand, characterized by more favorable growth prospects and generally higher firm growth (Liedholm, 2002; Oberhofer, 2010). On the other hand, the *regulatory and institutional environment* shapes and determines business and growth opportunities of establishments and may adversely affect an establishment's growth prospects. For instance, previous analyses have demonstrated that labor and product market regulations may deter firms from expanding even if successful (Scarpetta et al., 2002; Haltiwanger et al., 2006). In a similar vein, firm growth tends to be significantly lower if firms face financial, legal, and corruption problems (Beck et al., 2005), obstacles related to finance, crime or political instability (Ayyagari et al., 2008; Hashi and Krasniqi, 2011) or consider taxes too constraining (Hashi, 2001; Hashi and Krasniqi, 2011).

3. Economic performance and banking sector structures in Emerging Europe

3.1. Growth performance in the Western Balkans and the NMS-10

In the run-up to the global financial crisis, the Western Balkan countries performed a strong economic growth (see Figure 1). With annual average real GDP growth rates of about 6%, the period between 2003 and 2007 was one of the strongest in more than a decade. However, despite strong economic growth, real GDP per capita levels are still rather low and only slowly converging to NMS-10 levels. Economic growth was mainly driven by strong domestic demand, fueled by excessive credit growth, while productive investment in machinery and equipment played a limited role only.

However, in the second half of 2008, the effects of the global financial crisis started to be felt in the region: on the one hand, demand for Balkan exports fell as a result of a slowdown in global demand, but more importantly, of a sharp drop in demand from countries in the Euro area, which are the main trading partners for the region. On the other hand, FDI inflows, which previously had predominantly come from Europe, declined sharply, depriving the region of revenues, which proved vital for its pre-crisis economic performance. By 2009, the crisis had a tight grip on the region: real GDP contracted the most in Croatia (-7.4%), followed by Montenegro (-5.7%), Serbia (-3.1%) and Bosnia and Herzegovina (-2.9%), and only moderately in Macedonia (-0.4%). Both Albania and Kosovo experienced slowdowns in economic growth (Albania: down from 7.5% in 2008 to 3.4% in 2009; Kosovo: down from 7.2% in 2008 to 3.6% in 2009) but did not fall into recessions. The immediate effects of the crisis were short-lived and except for Croatia, whose economy remained in a recession until 2014, all economies in the region recorded positive real GDP growth in 2010 already.

Figure 1: Annual real GDP growth rates for the NMS-10 (plus Turkey) and the Western Balkans
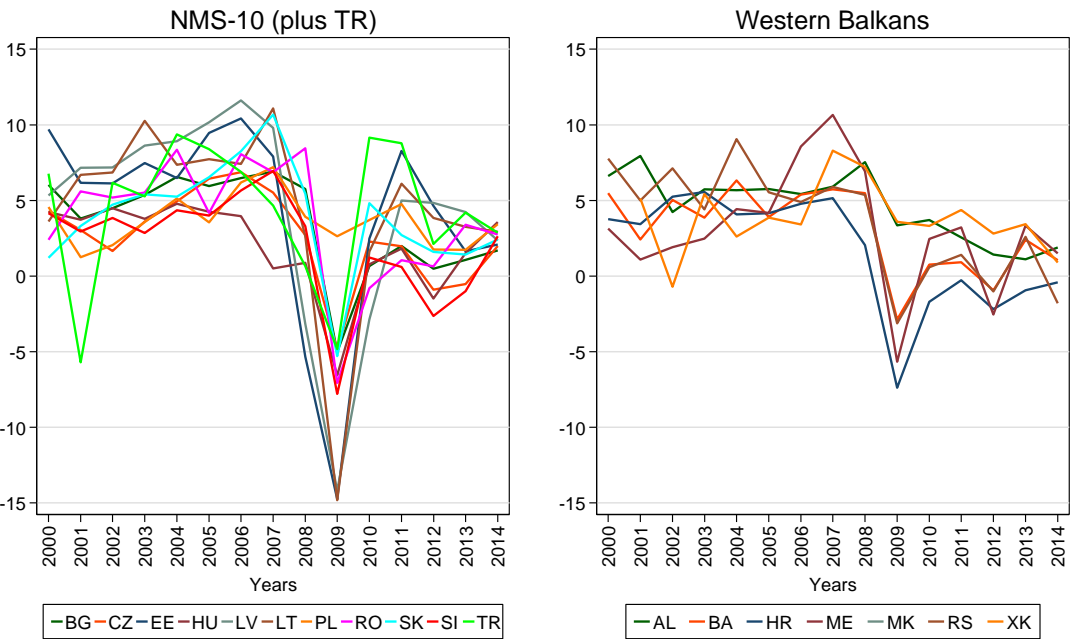
Source: wiiw Annual Database
Note: NMS-10 comprises Bulgaria (BG), the Czech Republic (CZ), Estonia (EE), Hungary (HU), Latvia (LV), Lithuania (LT), Poland (PL), Romania (RO), Slovakia (SK), Slovenia (SI). TR refers to Turkey. The Western Balkans comprise Albania (AL), Bosnia and Herzegovina (BA), Croatia (HR), Montenegro (ME), the former Yugoslav Republic of Macedonia (MK), Serbia (RS) and Kosovo (XK).

However, altogether, due to the post-crisis stress in the euro area in general and the dismal economic performance of Greece and Italy, in particular, growth in the post-crisis period has been lackluster in the Western Balkans. Particularly, in 2012, the region was hit by the second wave of the crisis – the Greek sovereign debt crisis – which given its strong links with Greece, exposed the region to the shock emanating from the Greek crisis. In particular, some

of the Western Balkans have strong economic links with Greece in areas like banking, trade and investments. Up until the advent of the crisis, Greek bank subsidiaries have strongly increased their presence in the Western Balkans, trade relations with Greece are strong and particularly important for Montenegro or Macedonia and Greek FDI in the region are non-negligible and particularly important for Albania, Serbia and Macedonia (Panagiotou, 2012). Furthermore, even stronger economic links with recession-ridden Italy also played a strong part in weak post-crisis growth: within the euro area, Italy is the most important export market for the region, especially for Albania, and is also a major investor in the region, especially in Albania and Montenegro. In the wake of the second wave of the crisis, all countries in the region - except for Albania and Kosovo - slipped into another recession, which was however more moderate. With -2%, the contraction of real GDP was highest in Montenegro and Croatia but more modest in Serbia and Bosnia and Herzegovina with only around -1% each.

In the NMS-10, the pre- and post-crisis growth experiences were somewhat different. Prior to the global financial crisis, economic growth was strong in the NMS-10, amounting to around 6% between 2000 and 2007 (see Figure 1). Both, sizeable capital inflows (particularly FDI) as well as an unprecedented credit boom were major drivers of pre-crisis growth. However, unlike in the Western Balkan countries, productive investment was a key driver of growth in the NMS-10. The period leading up to the crisis was characterized by growing money market and trade integration with the rest of the EU, trade deepening and increasingly attractive housing markets, eventually leading to the development of unprecedented housing bubbles in several NMS.

The global financial crisis hit the NMS-10 at the end of 2008. Consequently, net capital inflows into the NMS-10 collapsed temporarily since liquidity-shortages in their home countries induced many foreign bank subsidiaries in the region to temporarily interrupt capital flows into the region. This was accompanied by an exodus of other types of capital, particularly the most liquid types of investment like portfolio investment and financial derivatives. Furthermore, the quickly spreading crisis and the plunge in global – but particularly EU-15 wide – demand induced a pronounced drop in export demand for goods and tradable services from the region. From a global perspective, the global financial crisis hit the NMS the hardest, resulting in a drop in real GDP by around 4% in 2009 (wiiw, 2011). However, while real GDP contracted in almost all NMS-10 economies (plus Turkey), individual country experiences differed partly widely: real GDP contracted the most in the Baltic countries – the former growth champions - (by 14% on average), followed by Slovenia, Romania, and Hungary (by around 8% each) and Slovakia, Bulgaria, Turkey and the Czech Republic (by around 5% each). On the contrary, thanks to sound macroeconomic and financial management, Poland weathered the crisis without any losses in real GDP. The crisis was short-lived and except for Latvia and Romania, all NMS-10 economies (plus Turkey) already reported positive real GDP growth in 2010. Altogether, the experiences of the crisis differed between the NMS-10 and the Western Balkans: while the severity of the recession was higher in most NMS (particularly the Baltic) countries than in most Western Balkans, the recovery was also stronger, with fewer legacies in terms of high unemployment rates or excessive non-performing loans.

3.2. Financial and banking sector

Since 2000, financial sectors– particularly the banking sectors – in the NMS-10 and the Western Balkans underwent fundamental changes. Specifically, banking systems deepened significantly, indicating that the amount of banks' financial services available to the public expanded markedly. In particular, as highlighted above, recent growth was predominantly driven by swift credit growth, which helped raise domestic demand and investment. As highlighted by EC (2009), in the five years leading up to the financial crisis, domestic credit growth in the Western Balkans was in the double-digit range, amounting to over 100% annually in Montenegro and around 60% annually in Albania, on average, between 2005 and 2007. Consequently, the ratio of domestic credit to GDP increased significantly in the Western Balkans, particularly in Montenegro, Croatia and Bosnia and Herzegovina. In general, however, the credit boom observable in the Western Balkans was milder than the one observable in the NMS-10. However, the growth of credit was characterized by a two special features: first, credit growth was predominantly driven by household lending, leaving only a limited role to productive or investment activities that are, however, crucial for improvements in productivity; second, credit growth was largely based on lending in foreign currency or indexed to foreign currency (particularly in Albania and Macedonia), which was beneficial and advantageous given the exchange rate pegs used by some countries in the region but nonetheless exposed banking systems to non-negligible exchange rate risks. In general, however, financial deepening of banking systems was stronger in the Western Balkans than in the NMS-10 at the same stage of economic transition (Murgasova et al., 2015). Furthermore, financial development in the Western Balkans was uneven, more strongly concentrated in banking sectors, leaving non-bank financial services rather underdeveloped.

Figure 2. Share of foreign banks in the Western Balkans and the NMS-10
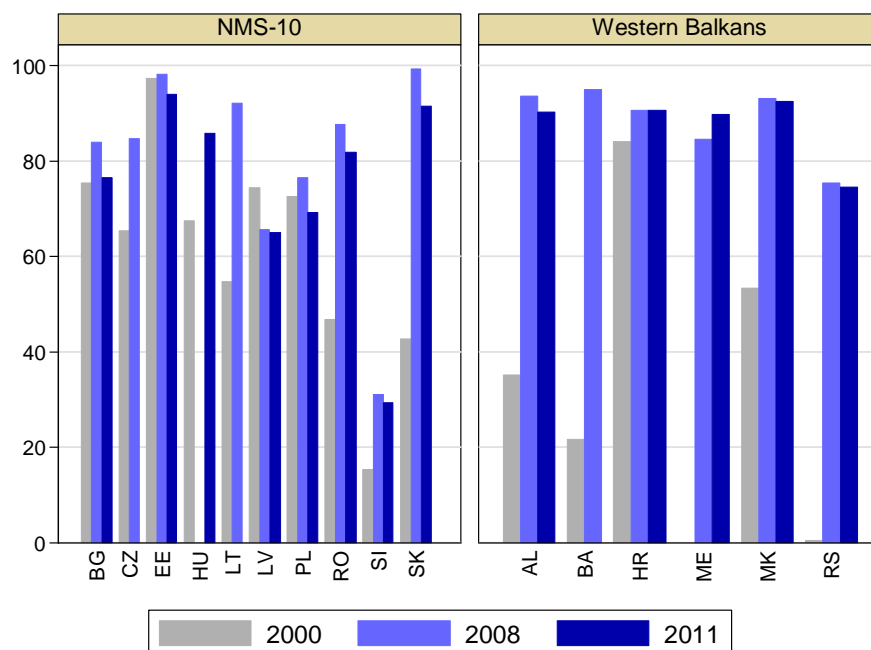
Swift bank deepening in Emerging Europe was favored and facilitated by two key developments. First, as a result of a comprehensive privatization push in the region's banking sectors starting in the early 2000s, massive inflows of FDI into the sector resulted in a strong presence of foreign – predominantly European – banks, accounting for 75 to 90% of banking system assets in 2008. As is apparent from Figure 2, this level of foreign ownership of banks in the Western Balkans is broadly in line with that observable in the NMS-10 at that time, probably a bit higher even. However, the share of foreign banks is more uniform in the Western Balkans but more diverse in the NMS-10, with Slovakia and Estonia showing the highest shares of foreign banks in the banking sector (with around 99% each) and Slovenia showing the lowest one, with only around 30%. In addition, as highlighted by DB (2012), the ownership structure of foreign banks is also a bit more concentrated in the Western Balkans than in the NMS-10: for instance, Italian and Austrian banks are dominant in Croatia, Greek, Italian, and Austrian banks are the major players in Serbia while Dutch and Greek banks dominate in Macedonia. This rapid inflow of foreign banks proved beneficial for Western Balkan banks in terms of greater stability of the region's banking systems, in general, and increased professionalism, know-how and efficiency but also better financial and risk management skills, in particular.

Second, as a result of global monetary easing and the accompanied availability of massive liquidity paired with improved creditworthiness of banks, access to international capital markets became easier and cheaper for financial institutions in the region.

However, the global financial crisis put an end to the pre-crisis credit boom, significantly slowing down credit growth across Emerging Europe. Crisis-related credit corrections were lower in the Western Balkans than in the NMS, resulting in a more moderate boom-bust credit cycle and consequently lower demand and GDP contractions there. Post-crisis credit corrections were not uniform across Western Balkan countries but strongly depended on the scale of pre-crisis credit booms. For instance, as highlighted by Murgasova et al. (2015), Montenegro, which saw the strongest credit boom among all European emerging economies, also experienced the most severe fall in credits, Croatia and Bosnia and Herzegovina saw their credit growth come to a halt, while credits still continued to grow in Albania, Kosovo and Macedonia.

The crisis left Emerging Europe with a legacy: as a result of dwindling demand and the slump in growth, the level of non-performing loans (NPLs) soared in Europe's emerging economies (Figure 3). The surge in NPLs was a bit more pronounced in the NMS-10 than in the Western Balkans though: in the NMS-10, NPLs increased the most in the Baltics, from relatively low pre-crisis levels of between 2 and 5% in 2008 to around 20% in Lithuania, 14% in Latvia and around 5% in Estonia in 2009. Strongly and steadily increasing NPLs were also observable in Romania, Hungary or Slovenia while in the remaining NMS, the rise in NPLs was rather moderate, not exceeding the 10% threshold. In the Western Balkans, with an increase to around 15%, the immediate post-crisis effect on NPLs was strongest in Serbia and Montenegro, while in the remaining Western Balkan countries, NPLs remained below 10%. However, while the immediate effect was rather muted, in the aftermath of the crisis, NPLs continuously increased - and are still increasing - in the majority of Western Balkan countries. Kosovo and Macedonia are notable exceptions, experiencing only moderate increases in NPLs to 6.4% in Kosovo in 2012 (from initially 3.7% in 2008) and to 9.7% in Macedonia in 2012 (from initially 6.7% in 2008).

Figure 3. Non-performing loans in the Western Balkans and the NMS-10 (as share of total gross loans)

NMS-10 (plus TR)	Western Balkans

BG — CZ — EE — HU — LV — LT — PL — RO — SI — SK — TR

AL — BA — HR — MK — ME — RS — XK
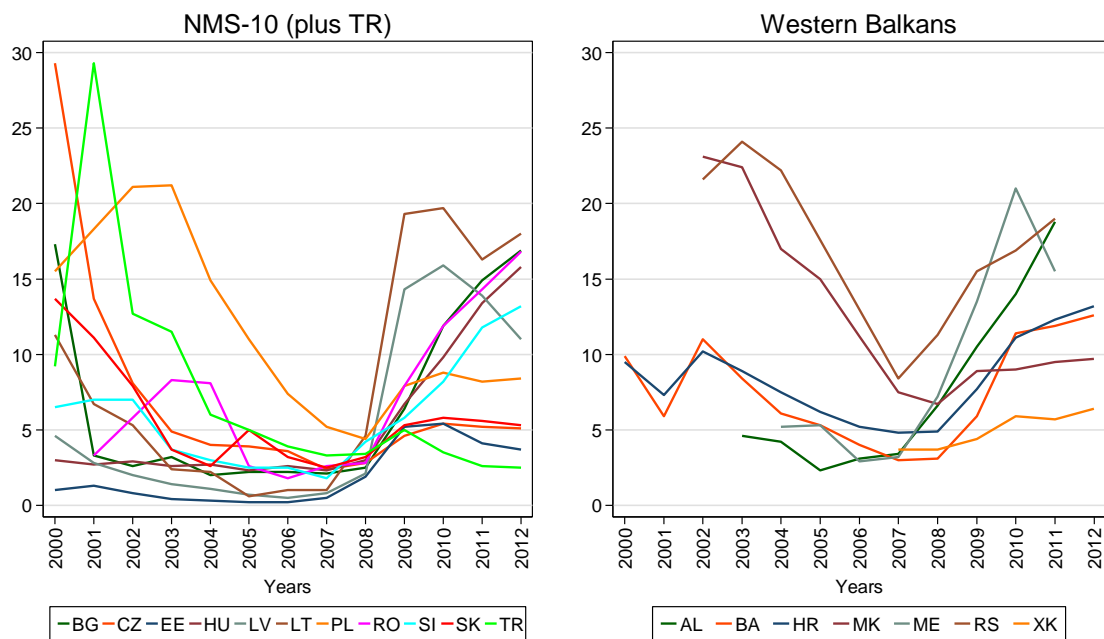
Source: WB WDI.

Note: NMS-10 comprises Bulgaria (BG), the Czech Republic (CZ), Estonia (EE), Hungary (HU), Latvia (LV), Lithuania (LT), Poland (PL), Romania (RO), Slovakia (SK), Slovenia (SI). TR refers to Turkey. The Western Balkans comprise Albania (AL), Bosnia and Herzegovina (BA), Croatia (HR), Montenegro (ME), the former Yugoslav Republic of Macedonia (MK), Serbia (RS) and Kosovo (XK).

4. Data sources

The ensuing analysis uses firm-level data for a large set of Central Eastern and South Eastern European countries (CESEEC) comprising all new Member States (but Malta and Cyprus) (referred to as NMS-10), all Western Balkan countries (namely the EU Candidate Countries of the former Yugoslav Republic of Macedonia (MK), Montenegro (ME), Serbia (RS) as well as Albania (AL), Bosnia and Herzegovina (BA), Croatia (HR) and Kosovo (XK)) as well as Turkey (TR) to shed light on the role of financing constraints on firm growth in both pre- and post-crisis periods. It uses the 4th and 5th waves of the Eastern European component of the Business Environment and Enterprise Performance Survey (BEEPS) which is a joint initiative of the World Bank Group (WB) and the European Bank for Reconstruction and Development (EBRD). In particular, the 4th wave - which was conducted in calendar years 2008/09 and refers to fiscal year 2007 - is used to analyze the period prior to the onset of the global financial crisis while the 5th wave - which was conducted between calendar years 2012 and 2013 and refers to fiscal year 2011/12 - is used to shed light on the post-crisis period.

The Enterprise Surveys have been conducted regularly since 2002 by means of face-to-face interviews with managers, owners or directors of establishments on a three- to four-year rotation in order to collect information on the quality of individual firms' business environment, how it is perceived by them and how it changes over time, identifying various constraints or obstacles to firm performance and growth and capturing the effects a country's business environment has on firms' international competitiveness.

Country samples are selected using random sampling, stratified by firm size (small: 5-19 employees; medium: 20-99 employees; large: more than 99 employees), region (of major economic activity) and industry (based on the ISIC classification, revision 3.1, covering all manufacturing sectors (group D), construction (group F), services (groups G and H), transport, storage and communications (group I) and IT (from group K)). The primary sampling unit of each survey is the establishment with five or more full-time employees, located in major urban centers, which is engaged in non-agricultural activities. The standardized sampling strategy and survey instruments used in collecting the data guarantees that survey data from different countries are comparable.

Overall, the pre-crisis sample consists of 6,183 establishments while the post-crisis sample covers 6,009 establishments (see Table A.1 in the Annex for a more detailed overview by country and period).

The analysis uses two different measures of growth, namely sales and employment growth, to highlight differences in determinants across measures, but more importantly, to also identify the labor-market effects of prevailing funding constraints. Hence, as a starting point, some general sales and employment growth patterns are discussed briefly, to shed light on the extent of growth and growth differences across countries in the sample and across periods covered. In particular, growth is defined as annualized growth between current sales (or employment of permanent, full-time individuals) and sales (or employment of permanent, full-time individuals) three years before. Average annualized sales and employment growth rates are shown in Panel A and B, respectively, of Figure 4, separately for the group of NMS-10 countries plus Turkey, on the one hand, and the group of Western Balkan countries, on the other.

In this respect, Panel A highlights that, before as well as after the global financial crisis, average annual sales growth rates were always higher (by between 3 and 8 percentage points) in the group of NMS-10 countries plus Turkey than in the group of Western Balkan countries. In particular, in the pre-crisis period, average annual sales growth amounted to around 38% in the group of NMS-10 countries plus Turkey and only to 30% in the group of Western Balkan countries. Because of the crisis, average annual sales growth rates were significantly lower in the post-crisis period and only reached around 14% in the group of NM-10 countries plus Turkey and only 11% in the group of Western Balkan countries. However, average sales growth rates show sizeable cross-country heterogeneity. With over 50% annually, average sales growth rates were particularly high in the pre-crisis period in Lithuania and Romania. Similarly, average sales growth rates were also high in Turkey, with over 40%, on average. In contrast, with only around 20%, average sales growth rates were relatively low in Hungary and Slovakia.

Figure 4: Annualized average sales growth (Panel A) and employment growth (Panel B) by country and period (in %)

Panel A: Sales growth

NMS-10 & TR	Western Balkan

Pre-crisis period   Post-crisis period
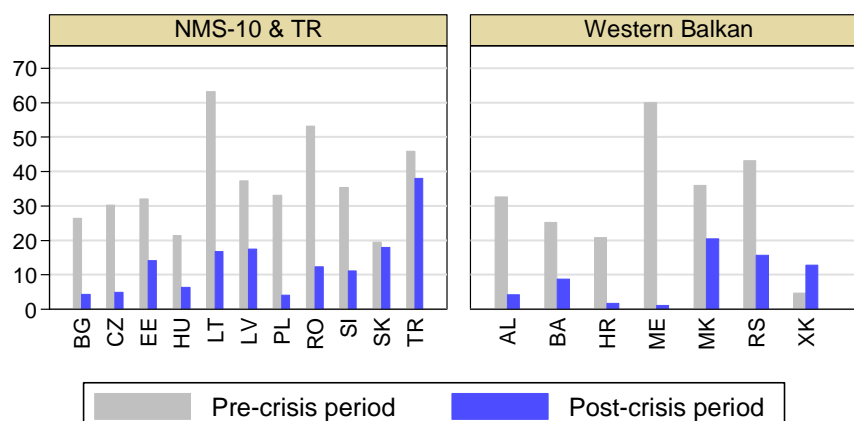
Panel B: Employment growth
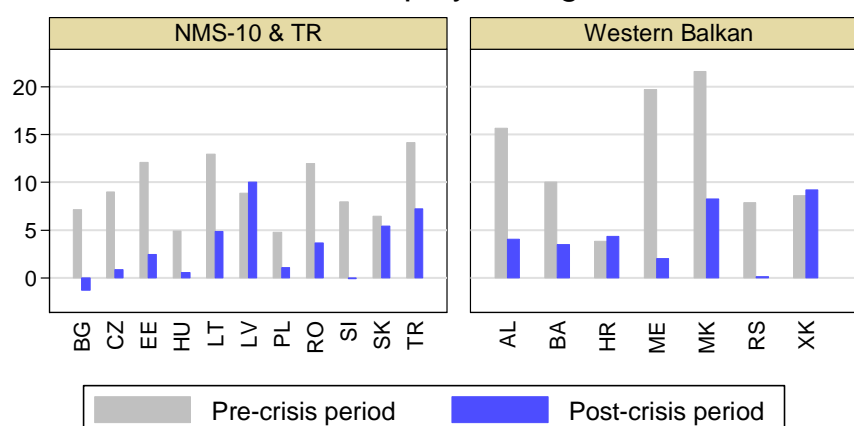
NMS-10 & TR	Western Balkan

Pre-crisis period   Post-crisis period

Source: BEEPS, own calculations.
Note: NMS-10 comprises Bulgaria (BG), the Czech Republic (CZ), Estonia (EE), Hungary (HU), Latvia (LV), Lithuania (LT), Poland (PL), Romania (RO), Slovakia (SK), Slovenia (SI). TR refers to Turkey. The Western Balkans comprise Albania (AL), Bosnia and Herzegovina (BA), Croatia (HR), Montenegro (ME), the former Yugoslav Republic of Macedonia (MK), Serbia (RS) and Kosovo (XK).

A similarly diverse picture also emerges for the group of Western Balkan countries: with almost 60% per annum, average sales growth rates are the highest in Montenegro, followed by Serbia (with 43%), Macedonia (with 36%) and Albania (with 33%). On the contrary, with only around 5%, Kosovo was the bottom of the league in the pre-crisis period. However, in both country-samples, cross-country average annual sales growth rates were considerably lower and less diverse in the post-crisis period. In the group of NMS-10 countries (plus Turkey), Turkey clearly stands out with an average annual sales growth of almost 40%. In contrast, average annual sales growth rates were below 20% in all NMS-10 countries. With around 18%, average annual sales growth rates were highest in Slovakia, Latvia and Lithuania. However, growth was particularly muted in Poland, Bulgaria and the Czech Republic, where average annual sales growth rates only reached around 5% per annum. In the Western Balkan, the crisis had a similar distortive effect on sales growth. And while sales

growth was relatively high in Macedonia (with around 20%), Serbia (with around 16%) or Kosovo (with 13%), it was dismal in Montenegro, Croatia and Albania.

In addition, Panel B shows average annual employment growth rates across countries and periods and generally points to more muted cross-country growth experiences. Moreover, in contrast to average sales growth rates, average employment growth rates are slightly higher, on average, in the group of Western Balkan countries than in the group of NMS-10 countries (plus Turkey), particularly in the pre-crisis period. Again, non-negligible differences in employment growth patterns are observable, across both countries and periods. In the pre-crisis period, among NMS-10 countries (plus Turkey), annual employment growth was highest in Turkey, Lithuania and Romania (with between 12 and 13%). However, with only around 5%, annual employment growth was particularly low in Hungary and Poland. A different picture is observable in the group of Western Balkan countries: with almost 22% per annum, employment growth was highest in Macedonia, closely followed by Montenegro and Albania. On the contrary, with only around 4%, average employment growth was extremely low in Croatia. Again, the effects of the global financial crisis clearly show up in cross-country employment growth performances. In the group of NMS-10 countries (plus Turkey), employment growth is even negative for Bulgaria and Slovenia, only slightly positive for Hungary and the Czech Republic and between 3 and 5% in Romania, Estonia, Lithuania and Slovakia but highest in Latvia, with 10%. The picture is less bleak for the Western Balkan countries where Kosovo and Macedonia stand out with an annual average employment growth rate of around 9% in the post-crisis period. Post-crisis employment growth is, however, more muted in the remaining Western Balkan countries and lowest in Serbia with below 1%.

5. The prevalence of and reasons for funding constraints

The ensuing analysis uses two different proxy variables for funding constraints to identify whether and to what extent such constraints affect firm growth, both before and after the onset of the global financial crisis of 2008. First, the dummy variable *Rejected* is derived from the following question covered in the BEEPS questionnaire: *'Referring to this most recent application for a line of credit or loan, what was the outcome of that application?'*. Several options are available to the interviewee: a) application was approved, b) application was rejected, c) application was withdrawn by the establishment, d) application still in process, and e) don't know. The dummy variable Rejected is set equal to 1 if the application was rejected, and zero if the application was either withdrawn by the establishment or still in process at the time of the interview (Don't know is treated as missing). Second, the dummy variable *Constrained* is derived from the following question in the BEEPS questionnaire: '*What was the main reason why this establishment did not apply for any line of credit or loan?*'. A number of different options were available to the interviewee. The variable Constrained is set equal to 1 for either of the following reasons: (i) application procedures were complex, (ii) interest rates were not favorable, (iii) collateral requirements were too high, (iv) size of loan and maturity were insufficient, (v) it was necessary to make informal payments to get bank loans, (vi) did not think it was approved, and finally, (vii) other (not specified). It is equal to zero if there was no need for a loan since the

establishment had sufficient own capital. The first indicator (i.e. *Rejected*) will be used to analyze the sub-set of establishments which actually applied for any loans or lines of credit while the second indicator (i.e. *Constrained*) will be used for the sub-set of establishments which – for the different reasons outlined above - did not apply for any loans or lines of credit, despite the need for funds.

First, to establish the need for external funding, the share of establishments that applied for a bank loan or line of credit is depicted in in Figure 5 below, which points to partly pronounced differences across countries. For instance, prior to the crisis, in the group of NMS-10 (plus Turkey), with more than 50%, the share of establishments that applied for a loan is particularly high in Slovenia and Turkey. On the contrary, with only around 25%, it is particularly low in Hungary or Slovakia. During the post-crisis period, which is characterized by lower loan application rates in general, the share of establishments that applied for a loan is relatively high in Romania (with almost 40%) and Turkey (with around 30%) and particularly low in Latvia or Bulgaria.

Figure 5: Share of establishments that applied for a bank loan or line of credit, by country
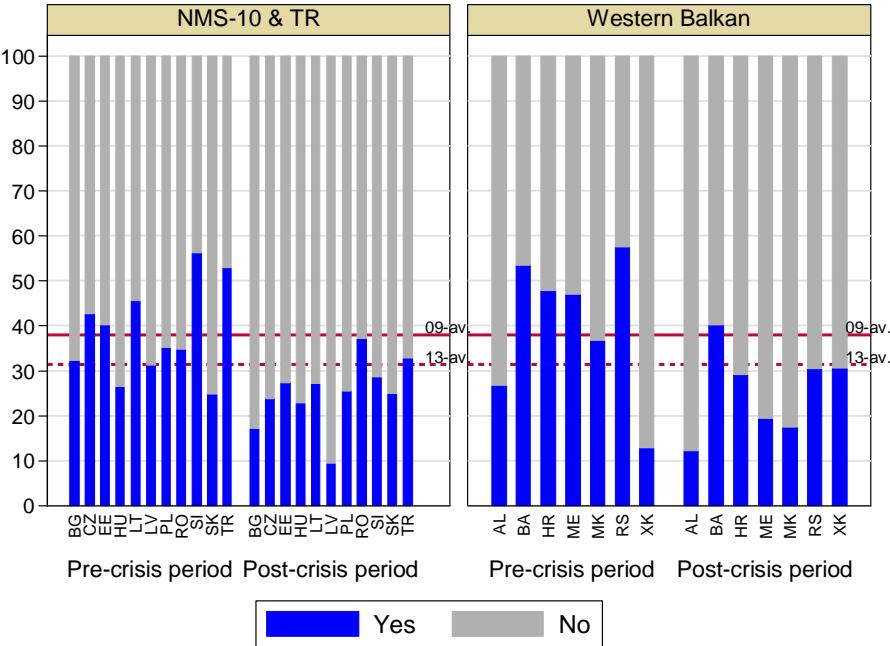
Source: BEEPs, own calculations
Note: NMS-10 comprises Bulgaria (BG), the Czech Republic (CZ), Estonia (EE), Hungary (HU), Latvia (LV), Lithuania (LT), Poland (PL), Romania (RO), Slovakia (SK), Slovenia (SI). TR refers to Turkey. The Western Balkans comprise Albania (AL), Bosnia and Herzegovina (BA), Croatia (HR), Montenegro (ME), the former Yugoslav Republic of Macedonia (MK), Serbia (RS) and Kosovo (XK). 09-av and 13-av refer to NMS-10 (plus TR) group averages for 2009 and 2013, respectively. Yes=applied for loan or line of credit.

A similarly diverse picture emerges for the group of Western Balkan countries. Prior to the crisis, the share of establishments that applied for a loan far exceeded the NMS-10 (plus Turkey) average in Serbia (with almost 60%), Bosnia and Herzegovina (with around 53%) as well as Croatia and Montenegro (both with almost 50%). On the contrary, with only around

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12%, only a very small fraction of establishments located in Kosovo applied for a bank loan. After the crisis, the share of establishments that applied for a bank loan exceeded the NMS-10 plus Turkey average of 31% in Bosnia and Herzegovina only. On the contrary, the fraction of establishments that applied for a bank loan was particularly low in Albania with only around 12%, followed by Macedonia and Montenegro with almost 20%.

Next, the prevalence of any form of constraints is depicted in Figure 6 below for each country separately, both before as well as after the onset of the global financial crisis. In particular, it depicts the share of establishments in each country sample that reported a need for any loans or lines of credit, but (i) either decided not to apply for one or (ii) whose application was rejected. It highlights for the group of NMS-10 countries (plus Turkey) that both, before and after the crisis, the share of constrained establishments was particularly high in Bulgaria and Latvia but low in Turkey (and also Slovenia, particularly in the pre-crisis period).

Figure 6: Share of establishments that faced any form of constraints

Source: BEEPs, own calculations

Note: NMS-10 comprises Bulgaria (BG), the Czech Republic (CZ), Estonia (EE), Hungary (HU), Latvia (LV), Lithuania (LT), Poland (PL), Romania (RO), Slovakia (SK), Slovenia (SI). TR refers to Turkey. The Western Balkans comprise Albania (AL), Bosnia and Herzegovina (BA), Croatia (HR), Montenegro (ME), the former Yugoslav Republic of Macedonia (MK), Serbia (RS) and Kosovo (XK). The blue part of the bars refers to the percentage of firms that reported a need for any loans or lines of credit but either decided not to apply for one or were rejected when they applied. 09-av and 13-av refer to NMS-10 (plus TR) group averages for 2009 and 2013, respectively.

In the group of Western Balkan countries, the share of constrained establishments appears higher, on average. In the pre-crisis period, almost every establishment in Kosovo faced any form of constraints while in Montenegro and Macedonia, every second one was constrained. During the post-crisis period, the situation became even bleaker. The only notable exception

is Bosnia and Herzegovina, where less than every third establishment faced constraints. In the remaining Western Balkan countries, constraints were widely present and widespread and particularly high in Albania and Montenegro, followed by Croatia, Macedonia and Serbia. Interestingly, the situation improved significantly in Kosovo where after the crisis, less than every second establishment experienced any form of financing constraints.

However, as outlined above, the analysis differentiates between two different types of constraints and their effects on firm growth. Hence, Figure 7 depicts the share of establishment whose credit applications were rejected while Figure 8 shows the relative importance of different reasons why establishments desisted from applying for bank loans, despite the apparent need for external funds.

Figure 7: Share of establishments whose loan application was rejected, by country
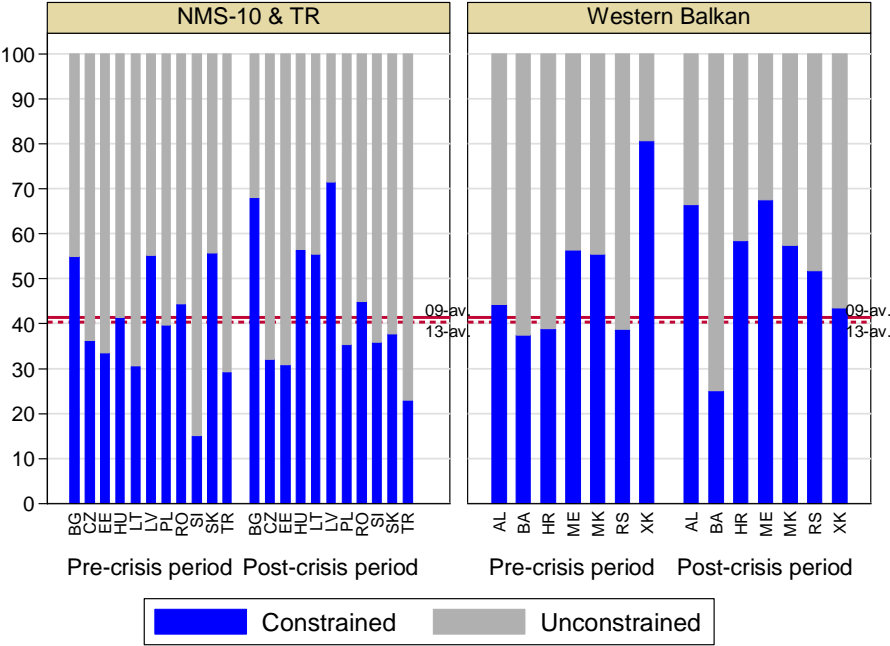

Source: BEEPs, own calculations.
Note: Note: NMS-10 comprises Bulgaria (BG), the Czech Republic (CZ), Estonia (EE), Hungary (HU), Latvia (LV), Lithuania (LT), Poland (PL), Romania (RO), Slovakia (SK), Slovenia (SI). TR refers to Turkey. The Western Balkans comprise Albania (AL), Bosnia and Herzegovina (BA), Croatia (HR), Montenegro (ME), the former Yugoslav Republic of Macedonia (MK), Serbia (RS) and Kosovo (XK). 09-av and 13-av refer to NMS-10 (plus TR) group averages for 2009 and 2013, respectively. Yes=rejection.

Figure 7 highlights that only a small fraction of loan applications was actually rejected by banks, with obvious differences across countries and periods however. Prior to the crisis, in the group of NMS-10 countries plus Turkey, rejection rates were particularly high in Latvia, the Czech Republic and Bulgaria where every 4th to 5th application was rejected by banks. In contrast, with less than 10%, rejection rates were extremely low in Slovenia and Hungary. Surprisingly, loan rejection rates were remarkably low during the post-crisis period and below 10% in the majority of countries in the region. On the contrary, rejection rates were exceptionally high in Latvia and Lithuania, where the global financial crisis led to severe recessions. In both Baltic countries, every 3rd loan application was rejected by banks.

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Similar diverse patterns are observable for the group of Western Balkan countries. Prior to the crisis, loan rejection rates were particularly high in Kosovo, where almost every 2nd loan application was rejected, followed by Macedonia, where every 4th application was rejected. Loan rejection rates were more uniform among the remaining Western Balkan countries and range between 15 and 20%. Again, loan rejections became less prevalent during the post crisis period: the majority of Western Balkan countries shows rejection rates of only around 5%, stressing that only every 20th application was rejected on average. Croatia and Montenegro stand out, however. In Croatia, almost every 3rd loan application was rejected while in Montenegro, every 10th loan application was rejected.

Furthermore, as highlighted in section 1, related empirical evidence highlights that rejections of loan applications differ by particular establishment characteristics. Hence, Annex Tables A.2 and A.3 report loan rejection rates (in terms of the share of establishments whose loan applications were rejected) by some selected establishment characteristics. They point to non-negligible cross-country heterogeneity and demonstrate that, by and large, SMEs are more likely to see their loan applications rejected than larger establishments. In the pre-crisis period, SMEs in Latvia, the Czech Republic, Bulgaria or in Kosovo, Macedonia and Albania faced particularly high chances of rejection. In the post-crisis period, the situation was particularly bleak for SMEs in Latvia or Croatia. On the contrary, newcomers (i.e. establishments that are younger than 5 years), majority foreign-owned establishments (with more than 50% owned by private foreign individuals, companies or organizations) and product innovators are less likely to experience rejections of their loan applications. The picture is, however, less clear-cut for trading establishments but tend to show that relative to purely domestically-oriented establishments, trading establishments are more likely to see their loan applications rejected due to the riskier international activities they pursue. Rejection rates also differ by economic period considered: most prominently, in the post-crisis period, small establishments were more likely to have their loan applications rejected while, on the contrary, product innovators faced considerably lower rejection rates.

Finally, the importance of different reasons for not applying for a bank loan despite the apparent need is depicted in Figure 8 below for both country samples and periods separately. It highlights that the need for bank loans and the relative importance of different reasons why establishments did not apply for bank loans differed across countries. Prior to the crisis, in the group of NMS-10 countries plus Turkey, the need for a bank loan was highest in Bulgaria (with 40%) and Romania (with around 35 percent) but lowest in Slovenia (with around 11%), followed by the Czech Republic, Estonia, Hungary and Turkey, all with around 20 percent. Furthermore, complex procedures were a particularly strong deterrent in Romania and Estonia, unfavorable interest rates mattered strongly in Bulgaria, Poland or Turkey while high collateral requirements were decisive in Slovakia. In the post-crisis period, some interesting changes are observable: for instance, the need for loans was particularly low in the Czech Republic, followed by Turkey, Poland, Latvia and Estonia. Furthermore, in Hungry, insufficient loan size becomes an important deterrent while in Latvia and Estonia, many entrepreneurs did not apply for bank loans since they assumed that their application would not be approved anyway.

Figure 8: Reasons for not applying for a bank loan or line of credit, by country
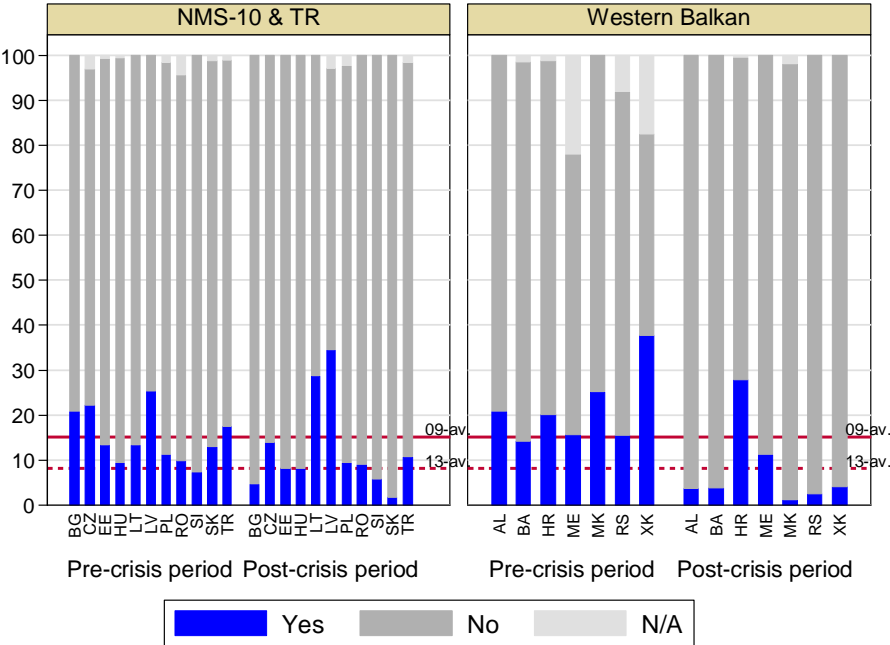

Source: BEEPs, own calculations
Note: Note: NMS-10 comprises Bulgaria (BG), the Czech Republic (CZ), Estonia (EE), Hungary (HU), Latvia (LV), Lithuania (LT), Poland (PL), Romania (RO), Slovakia (SK), Slovenia (SI). TR refers to Turkey. The Western Balkans comprise Albania (AL), Bosnia and Herzegovina (BA), Croatia (HR), Montenegro (ME), the former Yugoslav Republic of Macedonia (MK), Serbia (RS) and Kosovo (XK). 09-av and 13-av refer to NMS-10 (plus TR) group averages for 2009 and 2013, respectively.
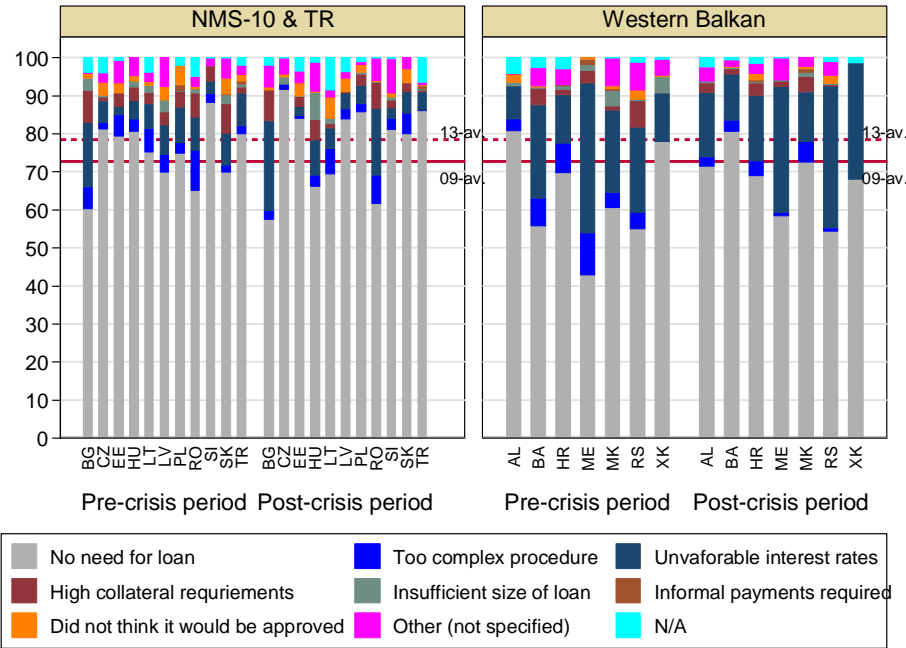
In the Western Balkan countries, there was generally a higher need for loans, both before as well as after the crisis. Prior to the crisis, the need for a loan was exceptionally high in Montenegro where almost 60% of entrepreneurs were in need of external funds. With between 40 to 45%, the need for loans was somewhat lower in Bosnia and Herzegovina, Serbia and Macedonia. On the contrary, the need for loans was extremely low in Albania and Kosovo. Without exception, unfavorable interest rates were considered the prime deterrent in all Western Balkan countries. Procedural complexity also mattered strongly in Montenegro or Croatia while high collateral requirements played a non-negligible role in Serbia. After the crisis, the need for loans was still highest in Serbia and Montenegro but relatively low in Bosnia and Herzegovina. In addition, unfavorable interest rates were still the main reason for establishments in the region to not applying for loans.

In addition, Annex Tables A.4 and A.5 highlight that the share of establishments that did not apply for bank loans despite the need for external funds (as a share of all establishments that did not apply for bank loans) also differs by establishment characteristics. For instance, they show that SMEs are more likely to not apply for loans in spite of the need for external funds. Hence, this demonstrates that SMEs are generally at a disadvantage in credit application processes: due to procedural complexities, excessive interest rates or collateral requirements or the need to make informal payments, SMEs are not only less likely to apply for bank loans – despite the need for funds – but once a credit application has been submitted, they also have lower chances having them approved (see Annex Tables A.2 and A.3). Furthermore, our results show that trading establishments are more likely, while

majority foreign-owned establishments are less likely to abstain from applying for bank loans, despite the need for external funds. The latter may benefit from easy access to internal capital markets that help satisfy their capital needs, rendering a loan application unnecessary.

6. Drivers of and obstacles to firm growth: Methodological approach

To identify the role of prevailing funding constraints for firm growth and the differences across country samples, the following specification is analyzed[8]:

$$Growth_{ijkt} = \alpha + \beta_1 FC^m_{ijkt} + \beta_2 Balkan_{kt} + \beta_3 FC^m_{ijkt} * Balkan_{kt} + \gamma X_{ijkt} + \delta Y_{jt} +$$
$$\vartheta D_{kt} + \varepsilon_{ijkt} \hspace{5cm} (1)$$

where $Growth_{ijkt}$ is the dependent variable and refers to the annualized growth rate (between time t and $t-3$) of establishment i in industry j and country k at time t.[9] As highlighted above, the analysis uses two different growth indicators, namely i) growth in sales and ii) growth in (full-time, permanent) employment to also point to labor-market related effects of prevailing funding constraints. Moreover, to also identify the effects of the global financial crisis, the analysis looks at two different periods: the pre-crisis period ($t = 2007$), referring to fiscal year 2007, and the post-crisis period ($t = 2011/12$), referring to fiscal year 2011/12.

FC^m_{ijkt} (with $m = Total, Rejected, Constrained$) is the main variable of interest, capturing the effect of different types of financing constraints on firm growth. As highlighted above, the analysis differentiates between two different types of financing constraints, namely *Rejected* for establishments that applied for a bank loan but whose credit application was rejected and *Constrained* for establishments that would have needed external funds but, due to different reasons (outlined above), did not apply for loans or lines of credits. However, as a starting point, a composite financing constraint variable is used, which is equal to 1 for establishments that faced any kind of constraints, i.e. *Rejected* or *Constrained*. This allows us to shed light on the determinants of growth, in general, and the role of financing constraints, in particular, for all firms in the sample. In contrast, differentiating between the two different types of financing constraints separates the overall firm sample in two separate samples - depending on whether establishments faced one or the other type of financing constraint – potentially leading to different inferences depending on the average characteristics of all establishments in the two different samples.

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[8] See Tables A.6 and A.7 in the Annex for summary statistics and Table A.8 and A.9 in the Annex for correlation matrices of of the main variables used in the estimations.

[9] It refers to the annualized growth rate defined as follows: $\left(\frac{A(t_0)}{A(t_{-3})}\right)^{1/n} - 1$, where $A(t_0)$ refers to the current value, $A(t_{-3})$ refers to the value three years previously and $n = t_0 - (t_{-3})$.

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$Balkan_{kt}$ is a dummy that is equal to 1 if a country is a Western Balkan country, and zero otherwise. It is included to test whether establishments located in any Western Balkan country show significantly different (sales or employment) growth rates relative to those located in the more advanced NMS-10.

$FC_{ijkt}^{m} * Balkan_{kt}$ is an interaction term, included to capture whether financing constraints exert a different effect on growth of establishments located in Western Balkan countries compared to those located in the NMS-10.

Furthermore, X_{ijkt} is a matrix of establishment-level control variables, capturing:

Firm age: is defined as the log of the difference between the current year t and the year of the firm's establishment or registration and is included to test for the empirically supported assertion that age and growth are negatively related. Furthermore, to test for the presence of a non-linear relationship between firm growth and age, the square of log firm age was also included.

Firm size: is defined as the firm's initial size and included to test the size-growth nexus. As highlighted in the literature review, most empirical studies find a negative relationship between firm size and growth. Contingent on the particular dependent variable studied, different measures of firm size were used to avoid issues of endogeneity. In particular, for the sales growth equation, the log of the initial number of employees was used while for the employment growth equation, the log of initial sales was used instead. In addition, to test for the presence of a non-linear relationship between firm growth and size, its square terms were also accounted for in the analysis.

Years of experience of Top Manager: is defined as the log of the number of years of work experience of the Top Manger in the establishment's sector. It is included to test whether the Top Manager's work experience is indeed growth-enhancing. In general, however, empirical evidence is rather mixed and sometimes even negative.

Ownership structure: the analysis uses two different ownership indicators to test whether a particular ownership structure is more conducive to growth: first, the share of the establishment owned by *private foreign* individuals, companies or organizations (in %); second, the share of the establishment owned by the *government or state* (in %); the share of the establishment owned by private domestic individuals, companies or organizations serves as reference group. Empirical evidence generally emphasizes that foreign ownership is conducive to firm growth.

Trading status: is captured by means of three different dummy variables. First, a dummy variable is included for exporters only, which is equal to 1 if an establishments is a direct exporter only (i.e. reports positive direct exports only but no direct imports of material inputs or supplies), and zero otherwise. Second, a dummy variable is included for importers only, which is equal to 1 if an establishments is a direct importer of material inputs or supplies only (but no direct exporter), and zero otherwise. Finally, a dummy variable is included for exporters and importers, which is equal to 1 if an establishments is both a direct exporter and a direct importer, and zero otherwise. Trading status is included to identify whether exporters, through more diversified markets and customer bases or better

technological capacities and improved competitiveness, grow faster or whether importers, through better access to foreign knowledge and technology, also grow faster.

Product innovator: is a dummy that is equal to 1 if an establishment introduced a new or significantly improved product or service during the previous three years. Unfortunately, given the absence of information on process innovations in the 4th wave of the Enterprise Survey, their role could for firm growth could not be consistently estimated. Empirically, while employment effects of process innovations are mixed and inconclusive, product innovations are generally found to be associated with employment growth.

Big city: is a dummy that is equal to 1 if an establishment is located in the capital city or a city with a population of over 1 Mio. It is included to highlight that establishments located in larger cities/metropoles profit more from growth-enhancing spillovers than those located in less densely populated areas.

Y_{jt} refers to a matrix of country characteristics like:

Real GDP growth rate: defined as the average annual real GDP growth rate (in %) (over the last three years) to capture the state of the economy and the potentially favorable growth opportunities it offers to establishments.

Institutional characteristics: the analysis uses a number of different institutional characteristics to test whether and how the institutional environment affects business and growth opportunities of establishments. In particular, the following institutional characteristics are included in the analysis: first, *paying taxes* which refers to all taxes and contributions that are government mandated (at any level: federal, state or local) and that apply to the standardized business and have an impact in its financial statements; second, *starting a business* which refers to all procedures officially required, or commonly done in practice, for an entrepreneur to start up and formally operate an industrial or commercial business, as well as the time and cost to complete these procedures and the paid-in minimum capital requirement; third, *resolving insolvency*, which refers to the time, cost and outcome of insolvency proceedings involving domestic entities. These indicators stem from the WB 'Distance to Frontier' Database. The reported score benchmarks economies with respect to regulatory best practices, showing the absolute distance to the best performance on each indicator. An economy's distance to frontier is indicated on a scale from 0 to 100, where 0 represents the worst performance and 100 the frontier. Hence, in any given year, the score measures how far an economy is from the best performance at that time.

Finally, D_k refers to industry dummies (i.e. Manufacturing, Construction with Services as reference group) while ε_{ijkt} refers to the error term.

However, above specification may result in badly estimated coefficients because of endogeneity of the product innovation indicator. In particular, faster growing firms may have a larger incentive to introduce new product innovations, which in turn, fosters further growth. Hence, to deal with endogeneity, a 2SLS approach is pursued in what follows, which solves a two-equation system and produces efficient estimators. Methodologically, it uses the fitted values of the first-stage equation (which regresses the endogenous product innovation variable on all exogenous controls plus a set of exogenous instruments) in the

second-stage equation, which in turn identifies the determinants of growth (including the role of product innovations). Potential instruments for the endogenous variable must be related to whether product innovations were introduced but unrelated to the error term. Several candidates were taken into account, but based on different tests, the analysis uses (all or some of) the following exogenous instruments:

Innovation strategy: three different innovation strategies are deemed relevant for the success of an establishment's innovative activities. In particular, as highlighted by Veugelers and Cassiman (1999), establishments often apply different innovation strategies to develop technological innovations: establishments either (i) invest in R&D to 'make' innovations in-house or indigenously, (ii) source externally and invest in machinery and equipment (M&E) and 'buy' technology and know-how embodied in machinery and equipment from the original innovator which can then be used to also develop new products or services or modify existing ones, or (iii) apply a mix of both strategies, both making and buying innovations and technology. Hence, three dummy variables are used: *make only* for establishments that only pursue the make-strategy, identified by current positive R&D expenditures, *buy only* for establishments that only pursue the buy-strategy, identified by positive investments in machinery and equipment or the use of technology licensed from a foreign-owned company, and *make and buy* for establishments that pursue both strategies. The three dummy variables are equal to 1 if the respective innovation strategy is pursued, and zero otherwise.

ISO: is a dummy variable that is equal to 1 if the establishment has an internationally-recognized quality certification.

Computer use: is a dummy variable that is equal to 1 if an establishment's workforce currently uses computers in their jobs, and zero otherwise.

A number of test statistics were used to determine the validity of above-mentioned instruments. Serious problems arise if the correlations between the excluded instruments and endogenous regressor are nonzero but only 'weak' so that the excluded instruments have little explanatory power only, i.e. if the correlations between the endogenous regressor and the excluded instruments are nonzero but small. Hence, the Stock-Yogo (2005) test for the presence of weak instruments is used which tests the null hypothesis that the estimator is weakly identified only and is therefore subject to bias one finds unacceptably large. The test for weak identification is an F-version of the Cragg-Donald Wald statistic. Stock and Yogo (2005) have compiled critical values for the Cragg-Donald F-statistic for different definitions of 'perform poorly' based on bias and size. Hence the Stock-Yogo weak-instruments test comes in two forms: maximal relative bias and maximal size, where the null is that the instruments do not suffer from the specified bias. Rejection of their null hypothesis represents the absence of a weak-instruments problem.

To test, whether (1) is identified, the Anderson (1984) underidentification test is used which uses canonical correlations between the excluded instruments and the endogenous regressors. Anderson's likelihood ratio test tests the null hypothesis that the smallest canonical correlation is zero. A failure to reject the null hypothesis calls the identification status of the estimated equation into question.

Furthermore, an overidentification test of all instruments is conducted based on the Sargan statistic. Rejection of the null hypothesis highlights that the instruments used in the analysis are not valid.

Finally, an endogeneity test is conducted which tests the null hypothesis that the specified endogenous regressor can actually be treated as exogenous. Rejection of the null hypothesis means that the variable needs to be treated as endogenous.

7. Findings

In what follows, results of the analysis are presented and discussed separately for the two different growth measures. In particular, section 7.1 presents results if growth is defined in terms of sales growth while section 7.2 present results if growth is defined in terms of employment growth instead, where employment refers to employment of permanent, full-time workers.

7.1. Sales growth

Indeed, results in Table 1 highlight that financing constraints (FC) do significantly obstruct firm sales growth, the effect, however, differs by type of financing constraint and economic period. For instance, the composite financing constraint indicator (FC-total) is significantly negative, irrespective of period considered. It suggests that, in the pre-crisis period, financially constrained establishments had almost 8 percentage points lower sales growth rates than unconstrained establishments. This effect was somewhat smaller in the post-crisis period, where financially constrained establishments had only around 6 percentage points lower sales growth rates than unconstrained ones. Interestingly, results are less robust once the two different types of financing constraints are considered instead. In particular, results suggest that irrespective of period considered, establishments whose credit application was rejected (FC-Rejected), did not grow at significantly lower rates than financially unrestricted establishments. On the contrary, a negative effect on firm sales growth is observable for establishments that abstained from applying for a bank loan despite the need for external financing (FC-Constrained). However, the negative growth-effect is confined to the post-crisis period only and suggests that in the post-crisis period, establishments that were in need of external funding but refrained from applying for bank loans had around 6 percentage points lower sales growth rates than those establishments that had no need for external funding.

Furthermore, results fail to find any significant geographic differences in sales growth rates of establishments. More specifically, there are no significant differences in sales growth rates, irrespective of whether establishments are located in the economically more advanced NMS-10 countries (plus Turkey) or the less advanced Western Balkan countries.

Similarly, the analysis also finds no evidence that financially constrained establishments located in the Western Balkan countries grow at significantly different rates than those located in the group of NMS-10 (plus Turkey).

On the contrary, in line with related empirical evidence, we find a significant negative relationship between firm age and sales growth. In particular, results suggest that another year of an establishment's life decreases annual sales growth by around 0.5 percentage points. (The effect is somewhat lower in the sample of establishments that applied for a bank loan but somewhat higher for those establishments that did not apply for a bank loan). Results also consistently point to a non-linear U-shaped relationship between firm age and sales growth, highlighting that the negative age-growth effect eventually dies out and probably even reverses as establishments grow older (and pass a particular threshold).

Furthermore, in line with related empirical results, there is evidence of a significant negative size-growth nexus (this effect is absent for the sample of firms that did not apply for a bank loan though). Moreover, we find evidence of a non-linear U-shaped relationship between size and sales growth. Hence, as establishments grow larger, the negative size-growth effect decreases and eventually even reverses (once a particular threshold is crossed). However, this non-linear relationship between size and sales growth is confined to the post-crisis period only.

Surprisingly, we fail to find any evidence supporting the notion that the Top Manager's work experience in the industry is indeed growth-enhancing.

We also find a limited role of ownership for sales growth rates. In particular, in contrast to related empirical evidence, we find that in the post-crisis period only, foreign ownership is associated with significantly lower sales growth rates. In particular, in terms of the size of the effect, results indicate that an increase in the foreign ownership share by another percentage point is associated with around 0.06 percentage points lower sales growth rates. In contrast, sales growth is statistically unrelated to state ownership.

Similarly, an establishment's trading status also matters for its sales growth experience. In particular, importing establishments experienced significantly lower sales growth rates than establishments that source from and cater to domestic markets only. This effect, however, only emerges in the post-crisis period, which was still characterized by low and only slowly recovering global trade. On the contrary, no significant differences in growth experiences are observable for establishments that either export only or both export and import: they fare equally badly (or well) than purely domestically-oriented establishments.

As expected, it makes a huge difference for sales growth whether an establishment is a product innovator or not.[10] Irrespective of the period considered, product innovators – i.e. establishments that introduced a new product or service - grew significantly faster than non-product innovators. The effect was markedly stronger in the pre-crisis period though but, due to sluggish and only slowly recovering domestic and global demand, fell to around a third in the post-crisis period. Hence, innovativeness turns out to be a recipe for success, guaranteeing more pronounced growth, even during economically difficult times.

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[10] Test statitics reported in Table 1 generally demonstrate that the variable ‚product innovations' needs to be treated as endogenous (the endogeneity test is rejected for all specifications at the 1% or 5% level), that instruments are valid (Sargan test is never rejected) and not weak (Stock-Yogo weak-instruments test is rejected) and that specifications are identified (Anderson's likelihood ratio test is always rejected).

Table 1: Regression results for sales growth: 2SLS

Variables	2009 (1)	2013 (2)	2009 (3)	2013 (4)	2009 (5)	2013 (6)	2009 (7)	2013 (8)	2009 (9)	2013 (10)	2009 (11)	2013 (12)
FC-Total	-7.640**	-5.656***	-6.324	-4.835*								
	(-2.228)	(-2.700)	(-1.493)	(-1.703)								
Balkan*FC-total			-3.761	-1.765								
			(-0.530)	(-0.426)								
FC-Rejected					-7.344	-2.481	-13.052*	2.622				
					(-1.252)	(-0.440)	(-1.794)	(0.362)				
Balkan*FC-Rejected							15.351	-12.075				
							(1.268)	(-1.106)				
FC-Constrained									-6.520	-5.696**	-1.741	-6.364**
									(-1.504)	(-2.404)	(-0.332)	(-1.962)
Balkan*FC-Constrained											-14.894	1.422
											(-1.611)	(0.300)
Balkan (yes=1)	-1.903	2.282	-1.017	2.697	0.343	9.867***	-1.964	10.609***	-3.454	-0.052	1.318	-0.478
	(-0.529)	(1.112)	(-0.257)	(1.189)	(0.065)	(2.582)	(-0.350)	(2.741)	(-0.694)	(-0.021)	(0.231)	(-0.168)
Log age	-52.982***	-50.871***	-53.024***	-50.977***	-34.411***	-36.283***	-34.112***	-36.351***	-66.557***	-58.380***	-66.408***	-58.291***
	(-5.855)	(-6.991)	(-5.860)	(-7.002)	(-2.679)	(-3.006)	(-2.655)	(-3.013)	(-5.220)	(-6.309)	(-5.215)	(-6.295)
Log age²	8.087***	7.344***	8.093***	7.365***	5.091**	4.687**	5.040**	4.694**	10.319***	8.828***	10.282***	8.810***
	(4.888)	(5.342)	(4.892)	(5.355)	(2.195)	(2.131)	(2.172)	(2.135)	(4.366)	(4.952)	(4.355)	(4.937)
Log size	-7.110*	-5.860**	-7.086*	-5.851**	-9.272*	-12.823***	-9.403*	-12.633***	-5.591	-2.938	-5.515	-2.939
	(-1.905)	(-2.144)	(-1.899)	(-2.141)	(-1.687)	(-2.914)	(-1.710)	(-2.870)	(-1.074)	(-0.781)	(-1.061)	(-0.781)
Log size²	0.304	0.750*	0.305	0.749*	0.397	1.574***	0.399	1.554***	0.213	0.365	0.221	0.366
	(0.619)	(1.953)	(0.621)	(1.951)	(0.577)	(2.818)	(0.580)	(2.782)	(0.296)	(0.643)	(0.307)	(0.644)
Log years of experience TM	-1.358	-0.194	-1.363	-0.170	0.365	0.585	0.351	0.651	-3.204	-0.481	-3.271	-0.505
	(-0.625)	(-0.136)	(-0.628)	(-0.119)	(0.119)	(0.249)	(0.115)	(0.277)	(-1.047)	(-0.268)	(-1.070)	(-0.281)
Foreign ownership share (%)	-0.081	-0.065*	-0.081	-0.064*	-0.087	-0.137**	-0.090	-0.136**	-0.072	-0.038	-0.079	-0.039
	(-1.493)	(-1.824)	(-1.504)	(-1.804)	(-0.990)	(-2.071)	(-1.033)	(-2.046)	(-1.018)	(-0.874)	(-1.115)	(-0.889)
State ownership share (%)	-0.069	-0.079	-0.068	-0.078	0.030	-0.055	0.030	-0.063	-0.162	-0.069	-0.151	-0.072
	(-0.395)	(-0.490)	(-0.388)	(-0.482)	(0.117)	(-0.258)	(0.118)	(-0.292)	(-0.681)	(-0.297)	(-0.635)	(-0.306)
Exporter only (yes=1)	0.988	1.453	0.980	1.452	4.767	1.964	4.976	1.804	-3.380	1.395	-3.289	1.390
	(0.262)	(0.589)	(0.260)	(0.588)	(0.920)	(0.519)	(0.961)	(0.477)	(-0.611)	(0.431)	(-0.595)	(0.430)

Table 1 continued

Variables	2009 (1)	2013 (2)	2009 (3)	2013 (4)	2009 (5)	2013 (6)	2009 (7)	2013 (8)	2009 (9)	2013 (10)	2009 (11)	2013 (12)
Importer only (yes=1)	-3.815	-7.549*	-3.947	-7.542*	4.067	-3.020	4.049	-3.087	-14.905	-8.902*	-16.073	-8.901*
	(-0.523)	(-1.855)	(-0.540)	(-1.853)	(0.419)	(-0.462)	(0.417)	(-0.472)	(-1.349)	(-1.724)	(-1.451)	(-1.724)
Exporter & importer (yes=1)	-5.962	-0.349	-6.001	-0.287	-9.190	-0.953	-9.093	-0.844	-2.957	-0.209	-3.108	-0.258
	(-1.172)	(-0.101)	(-1.179)	(-0.083)	(-1.313)	(-0.172)	(-1.300)	(-0.152)	(-0.396)	(-0.047)	(-0.416)	(-0.058)
Product innovator (yes=1)	7.449***	2.337***	7.439***	2.327***	8.083***	3.632***	8.126***	3.631***	6.466***	1.797**	6.446***	1.804**
	(5.913)	(4.043)	(5.907)	(4.019)	(3.979)	(3.583)	(3.988)	(3.584)	(3.978)	(2.509)	(3.974)	(2.510)
Big City (yes=1)	-2.285	-3.673*	-2.289	-3.684*	0.170	-6.378*	0.493	-6.520*	-3.092	-2.746	-2.824	-2.743
	(-0.767)	(-1.746)	(-0.768)	(-1.751)	(0.039)	(-1.755)	(0.114)	(-1.795)	(-0.744)	(-1.060)	(-0.681)	(-1.059)
Real GDP growth rate	0.086	3.274***	0.065	3.286***	-0.928	3.559***	-0.827	3.437***	0.528	3.258***	0.487	3.242***
	(0.100)	(5.809)	(0.075)	(5.828)	(-0.664)	(3.687)	(-0.592)	(3.534)	(0.484)	(4.627)	(0.447)	(4.599)
Paying taxes	-0.264*	-0.067	-0.261*	-0.067	-0.358*	-0.218	-0.355	-0.198	-0.124	-0.007	-0.108	-0.007
	(-1.750)	(-0.744)	(-1.728)	(-0.741)	(-1.657)	(-1.380)	(-1.643)	(-1.246)	(-0.583)	(-0.064)	(-0.508)	(-0.066)
Starting a business	1.025***	0.512***	1.023***	0.512***	1.530***	0.893***	1.513***	0.886***	0.578	0.428***	0.535	0.428***
	(3.929)	(3.964)	(3.919)	(3.968)	(4.053)	(3.632)	(4.008)	(3.600)	(1.602)	(2.747)	(1.482)	(2.746)
Resolving insolvency	-0.381**	-0.173*	-0.380**	-0.172*	0.091	0.128	0.074	0.111	-0.757***	-0.282**	-0.769***	-0.283**
	(-2.025)	(-1.885)	(-2.021)	(-1.873)	(0.336)	(0.793)	(0.270)	(0.686)	(-2.856)	(-2.481)	(-2.900)	(-2.490)
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	35.061	55.750***	35.008	55.538***	-43.501	3.677	-42.041	3.172	102.430***	70.995***	104.298***	71.220***
	(1.360)	(3.400)	(1.358)	(3.388)	(-1.109)	(0.118)	(-1.073)	(0.102)	(2.946)	(3.600)	(3.003)	(3.612)
No of observations	3,566	3,654	3,566	3,654	1,730	1,096	1,730	1,096	1,836	2,558	1,836	2,558
Underidentification test												
Anderson can.corr. LM stat.	264.1	374.5	264.2	373.3	114.0	95.64	113.6	95.66	142.3	277.5	142.8	275.7
p-value	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Overidentifcation test												
Sargan statistic	1.929	5.015	1.908	4.968	4.614	2.450	4.603	2.420	2.658	3.174	2.643	3.217
p-value	(0.587)	(0.171)	(0.592)	(0.174)	(0.202)	(0.484)	(0.203)	(0.490)	(0.447)	(0.366)	(0.450)	(0.359)
Endogeneity test												
Endogeneity test	27.08	12.06	27.01	11.93	11.67	12.20	11.70	12.26	12.27	3.803	12.12	3.808
p-value	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)	(0.051)	(0.000)	(0.051)
Weak identification test												
Cragg-Donald Wald F-stat.	70.83	103.6	70.84	103.2	30.08	25.62	29.95	25.60	38.05	77.08	38.17	76.51
5% maximal IV relative bias	16.85	16.85	16.85	16.85	16.85	16.85	16.85	16.85	16.85	16.85	16.85	16.85
10% maximal IV size	24.58	24.58	24.58	24.58	24.58	24.58	24.58	24.58	24.58	24.58	24.58	24.58

Note: Instruments used in all specifications: all different innovation strategies and iso.

Our results also point to 'agglomeration' effects and to the role played by being located in more densely populated, more competitive environments. More specifically, we find evidence of temporary diseconomies of agglomeration: probably due to lower demand and fiercer competition in the wake of the global financial crisis, establishments located in larger cities experienced significantly lower sales growth rates, particularly during the post-crisis period.

Furthermore, a set of macroeconomic characteristics were tested to shed light on their role for sales growth. On the one hand, in line with related empirical evidence, results highlight that the state of the economy, which determines establishments' growth opportunities, is conducive to an establishment's sales growth. But this only holds for the post-crisis period. On the other hand, the institutional environment is found to affect business and growth opportunities of establishments. However, the exact direction and scale of the effect differ by particular institution considered. For instance, business environments that make starting a business a comparatively easy and cheap endeavor are very conducive to sales growth, particularly in the pre-crisis period. On the contrary, business environments that help resolve insolvencies in a quick and costless manner are obstructive to sales growth, resulting in significantly lower sales growth rates, particularly in the pre-crisis period. Likewise, business environments with conducive tax regimes in terms of tax rates, the number of number of times the establishment pays taxes or the time taken to prepare, file and pay taxes (i.e. high distance-to-frontier rankings) are obstructive to sales growth, particularly during the pre-crisis period.

7.2. Employment growth

In line with results for sales growth, we do find strong evidence that prevailing financing constraints significantly obstruct firm growth. In the case of employment growth (see Table 2), however, effects are more robust and consistent across country samples and economic periods analyzed. In particular, the composite financing constraint indicator (FC-total) is negative and significant, irrespective of period considered and suggests that financially constrained establishments had around 4 percentage points lower employment growth rates than unconstrained ones. Moreover, this employment-effect was very similar across both periods. Similar negative employment growth effects are also observable once the two different types of financing constraints are considered. Specifically, results highlight that establishments whose credit applications were rejected (FC-Rejected) also observed around 6 percentage points lower employment growth rates. But this only holds for the post-crisis period. In the same vein, establishments that did not apply for bank loans – despite the need – observed around 4 percentage points lower employment growth rates, irrespective of the particular economic period (FC-Constrained). This finding indicates that the type of financing constraint matters for firm growth and suggests that a rejection of a loan application is more harmful to growth than procedural complexities or administrative hurdles, excessive costs or collateral requirements or the need for informal payments that induce entrepreneurs to abstain from applying for a bank loan or line of credit in the first place.

Moreover, results point to significant geographic differences in employment growth rates. Empirical evidence highlights that in the post-crisis period employment growth rates were higher in the Western Balkan countries than in the group of NMS-10 (plus Turkey). Particularly, establishments located in Western Balkan countries had between 2 to 3 percentage points higher employment growth rates than those located in the NMS-10 (plus Turkey). However, a more thorough analysis (not presented here) demonstrates that this finding is entirely driven by developments and employment changes of establishments located in Macedonia and Kosovo, which both avoided recessions during the crisis and post-crisis stress and where average annual employment growth rates were among the highest during the post-crisis period (see Panel B in Figure 4).

However, in contrast to sales growth, we do find evidence that the negative effects of financial constraints on employment growth differ by geographic location. Particularly, financial constraints were more harmful to employment growth of establishments located in the economically less advanced Western Balkan countries than to establishments located in the group of economically more advanced NMS-10 (plus Turkey). But this effect differs by type of financial constraint and only holds for the pre-crisis period where establishments located in the Western Balkan that did not apply for bank loans despite the need for external funding experienced around 7 percentage points lower employment growth rates than those with similar constraints located outside the region.

Again, in line with related empirical analyses, results point to the presence of a negative age-growth nexus, suggesting that another year of an establishment's life is associated with around 0.1 percentage points lower employment growth rates. In line with findings for sales growth, the relationship between age and employment growth is again characterized by a non-linear U-shaped relationship. However, in contrast to the more robust findings for sales growth, non-linearities are only observable for the post-crisis period.

A similar U-shaped relationship also exists between firm size and employment growth, highlighting that larger establishments also grow slower but that this effect diminishes and eventually reverses as establishments grow larger. However, in contrast to findings for sales growth, this effect is confined to the pre-crisis period only.

Interesting differences also emerge with respect to the role played by the Top Manager's work experience in an industry for an establishment's employment growth. While the Top Manager's work experience was irrelevant for an establishment's sales growth, it exerts a significant negative effect on an establishment's employment growth. But, this negative effect only emerges during the post-crisis period and seems to suggest that more experienced Top Managers pursue more conservative and cautious employment policies when, as a result of the global financial crisis, the business environment was still characterized by strong domestic and global uncertainties.

The role played by ownership structure for employment growth is also rather limited. While state-ownership is statistically unrelated to employment growth, foreign ownership and employment growth are negatively related. In contrast to findings for sales growth, the effect is only observable for the pre-crisis period, however. This suggests that in the run-up

to the global financial crisis establishments with a higher foreign ownership share were characterized by more muted employment growth.

Table 2: Regression results for employment growth: 2SLS

Variables	2009 (1)	2013 (2)	2009 (3)	2013 (4)	2009 (5)	2013 (6)	2009 (7)	2013 (8)	2009 (9)	2013 (10)	2009 (11)	2013 (12)
FC-Total	-3.453***	-3.960***	-1.244	-3.415***								
	(-2.620)	(-5.163)	(-0.784)	(-3.052)								
Balkan*FC-total			-6.275**	-1.157								
			(-2.266)	(-0.774)								
FC-Rejected					-2.223	-5.342**	0.072	-2.885				
					(-0.978)	(-2.085)	(0.026)	(-0.904)				
Balkan*FC-Rejected							-6.098	-5.700				
							(-1.262)	(-1.128)				
FC-Constrained									-4.149**	-3.902***	-1.766	-3.877***
									(-2.466)	(-4.637)	(-0.921)	(-3.110)
Balkan*FC-Constrained											-7.379**	-0.052
											(-1.968)	(-0.031)
Balkan (yes=1)	1.360	2.513***	2.833*	2.785***	1.724	3.014**	2.626	3.374**	1.767	2.073*	4.138	2.088*
	(0.945)	(2.888)	(1.711)	(2.845)	(0.855)	(2.155)	(1.195)	(2.404)	(0.853)	(1.940)	(1.586)	(1.647)
Log age	-10.395**	-14.082***	-10.438**	-14.151***	-13.938**	-16.924***	-13.976**	-16.959***	-5.770	-12.683***	-5.722	-12.686***
	(-2.384)	(-4.222)	(-2.408)	(-4.247)	(-2.096)	(-3.011)	(-2.110)	(-3.006)	(-1.017)	(-3.038)	(-1.016)	(-3.044)
Log age²	0.206	1.606***	0.222	1.620***	0.629	1.923**	0.642	1.929**	-0.345	1.400*	-0.347	1.401*
	(0.283)	(2.802)	(0.305)	(2.828)	(0.579)	(2.071)	(0.594)	(2.070)	(-0.350)	(1.896)	(-0.355)	(1.901)
Log size	-6.227**	-1.822	-6.310**	-1.822	-6.757*	-3.689	-7.027*	-3.750	-7.033*	-0.891	-6.953*	-0.891
	(-2.438)	(-1.115)	(-2.479)	(-1.113)	(-1.843)	(-1.458)	(-1.937)	(-1.476)	(-1.828)	(-0.519)	(-1.811)	(-0.519)
Log size²	0.178**	0.055	0.181**	0.055	0.190	0.145	0.199	0.148	0.208	0.011	0.206	0.011
	(1.960)	(0.926)	(2.001)	(0.927)	(1.520)	(1.513)	(1.608)	(1.533)	(1.468)	(0.177)	(1.454)	(0.177)
Log years of experience TM	-1.258	-1.029*	-1.276	-1.015*	-0.252	-0.014	-0.252	0.022	-2.293*	-1.402*	-2.339*	-1.401*
	(-1.424)	(-1.764)	(-1.450)	(-1.737)	(-0.217)	(-0.017)	(-0.217)	(0.027)	(-1.734)	(-1.846)	(-1.777)	(-1.843)
Foreign ownership share (%)	-0.032*	-0.011	-0.032*	-0.010	-0.031	-0.029	-0.029	-0.028	-0.021	-0.000	-0.024	-0.000
	(-1.676)	(-0.836)	(-1.696)	(-0.802)	(-1.116)	(-1.528)	(-1.030)	(-1.470)	(-0.824)	(-0.007)	(-0.921)	(-0.005)
State ownership share (%)	-0.097	-0.039	-0.094	-0.038	-0.205***	-0.042	-0.204***	-0.046	0.011	-0.047	0.017	-0.047
	(-1.235)	(-1.594)	(-1.204)	(-1.560)	(-3.223)	(-1.347)	(-3.275)	(-1.512)	(0.077)	(-1.345)	(0.119)	(-1.344)
Exporter only (yes=1)	3.257**	0.141	3.262**	0.128	3.723**	1.697	3.665**	1.594	2.103	-0.845	2.162	-0.845
	(2.319)	(0.165)	(2.326)	(0.151)	(1.994)	(1.174)	(1.971)	(1.102)	(1.007)	(-0.801)	(1.037)	(-0.801)

Table 2 continued

Variables	2009 (1)	2013 (2)	2009 (3)	2013 (4)	2009 (5)	2013 (6)	2009 (7)	2013 (8)	2009 (9)	2013 (10)	2009 (11)	2013 (12)
Importer only (yes=1)	4.842	-1.687	4.602	-1.705	7.655	-3.125	7.660	-3.172	0.001	-1.139	-0.627	-1.140
	(1.381)	(-1.185)	(1.313)	(-1.199)	(1.415)	(-1.451)	(1.416)	(-1.465)	(0.000)	(-0.612)	(-0.175)	(-0.612)
Exporter & importer (yes=1)	2.975	0.172	2.937	0.193	1.404	-0.904	1.382	-0.838	4.823	0.502	4.774	0.503
	(1.400)	(0.156)	(1.386)	(0.175)	(0.567)	(-0.518)	(0.557)	(-0.478)	(1.355)	(0.350)	(1.348)	(0.350)
Product innovator (yes=1)	14.162***	6.126***	14.100***	6.100***	16.648***	3.636	16.807***	3.660	14.736***	7.260***	14.546***	7.256***
	(7.283)	(4.247)	(7.278)	(4.229)	(4.043)	(1.600)	(4.074)	(1.615)	(5.720)	(3.940)	(5.715)	(3.932)
Big City (yes=1)	1.704	-2.087**	1.665	-2.097**	4.672***	-2.563**	4.526***	-2.616**	-0.916	-2.171**	-0.832	-2.171**
	(1.536)	(-2.522)	(1.503)	(-2.530)	(3.026)	(-2.110)	(2.939)	(-2.148)	(-0.579)	(-2.072)	(-0.530)	(-2.070)
Real GDP growth rate	-0.466*	0.906***	-0.499*	0.915***	-0.752	0.361	-0.787*	0.303	-0.348	1.106***	-0.369	1.107***
	(-1.647)	(4.188)	(-1.760)	(4.218)	(-1.610)	(0.929)	(-1.693)	(0.773)	(-0.974)	(4.211)	(-1.030)	(4.193)
Paying taxes	0.099*	0.053	0.102*	0.053	0.159*	0.203***	0.157*	0.212***	0.026	-0.009	0.032	-0.009
	(1.652)	(1.575)	(1.711)	(1.579)	(1.954)	(3.082)	(1.933)	(3.162)	(0.308)	(-0.228)	(0.372)	(-0.228)
Starting a business	0.115	0.081	0.113	0.081	0.120	-0.037	0.128	-0.041	0.147	0.121*	0.129	0.121*
	(1.284)	(1.576)	(1.256)	(1.586)	(1.002)	(-0.435)	(1.066)	(-0.472)	(1.106)	(1.928)	(0.976)	(1.926)
Resolving insolvency	-0.323***	0.037	-0.322***	0.038	-0.213**	-0.038	-0.207**	-0.046	-0.354***	0.055	-0.359***	0.055
	(-4.747)	(1.160)	(-4.741)	(1.177)	(-2.238)	(-0.627)	(-2.168)	(-0.769)	(-3.490)	(1.432)	(-3.548)	(1.424)
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	59.664***	31.227**	60.077***	31.044**	63.435**	46.700**	64.578**	46.910**	62.663**	25.169*	63.039**	25.160*
	(2.990)	(2.312)	(3.022)	(2.296)	(2.195)	(2.365)	(2.249)	(2.371)	(2.163)	(1.658)	(2.186)	(1.655)
No of observations	3,678	3,449	3,678	3,449	1,779	1,024	1,779	1,024	1,899	2,425	1,899	2,425
Underidentification test												
Anderson can.corr. LM stat.	144.9	935.4	144.9	934.1	45.14	293.0	45.35	293.1	94.45	617.9	94.87	616.8
p-value	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Overidentifcation test												
Sargan statistic	0.385	0.000690	0.393	1.14e-06	0.820	2.335	0.861	2.456	0.0150	1.089	0.0139	1.080
p-value	(0.535)	(0.979)	(0.531)	(0.999)	(0.365)	(0.127)	(0.354)	(0.117)	(0.902)	(0.297)	(0.906)	(0.299)
Endogeneity test												
Endogeneity test	55.00	5.196	54.84	5.128	13.03	0.0486	13.56	0.0586	38.09	5.947	37.73	5.875
p-value	(0.000)	(0.023)	(0.000)	(0.024)	(0.000)	(0.083)	(0.000)	(0.081)	(0.000)	(0.015)	(0.000)	(0.015)
Weak identification test												
Cragg-Donald Wald F-stat.	106.2	680.9	106.2	679.5	39.65	177.9	39.86	177.9	60.28	492.9	60.59	491.0
10% maximal IV size	19.93	19.93	19.93	19.93	19.93	19.93	19.93	19.93	19.93	19.93	19.93	19.93

Note: Instruments used in all specifications: a composite indicator for innovative activities and ict use.

Results attribute a similarly limited role to an establishment's trading status for its employment growth experience. In the pre-crisis period, when global demand was high and trade flourished, exporters only experienced significantly higher employment growth rates than establishments that sourced from and catered to domestic markets only. Hence, before the financial crisis struck, exporting to international markets proved conducive to employment growth. As a result of the crisis, however, the advantage and associated growth stimulus from exporting disappeared. On the contrary, no significant differences in employment growth experiences are observable for establishments that either import only or both export and import (relative to domestically-oriented establishments).

In line with above findings (i.e. when different determinants of sales growth were analyzed), results again point to the importance of pursuing innovative activities.[11] In particular, product innovators are again found to grow at significantly higher rates than non-innovators, irrespective of economic period considered. However, the effect on employment growth is considerably higher in the pre-crisis period than the post-crisis period. Hence, our results consistently demonstrate that irrespective of indicator used to measure growth, product innovations are conducive to growth, guaranteeing better employment growth performances even in economically difficult times of economic crisis and thereafter.

Agglomeration effects are also observable for employment growth of establishments. There is again evidence of temporary diseconomies of agglomeration, suggesting that probably due to fiercer competition in the wake of the global financial crisis, establishments located in larger cities experienced significantly lower employment growth rates during the post-crisis period. A more nuanced picture emerges, however, for the sub-sample of firms that applied for bank loans. For this particular sample of establishments, both economies as well as diseconomies of agglomeration are present, at different points in time, however: during the pre-crisis period, being located in a larger city proved conducive to employment growth while during the post-crisis period, the opposite effect was present, rendering larger cities less advantageous and growth-enhancing locations for establishments.

Finally, we again tested the relevance of a set of macroeconomic characteristics for firm growth. Our results highlight that the state of the economy matters for employment growth of establishments. Interestingly, effects differ by economic period considered: during the pre-crisis period, establishments located in faster growing economies experienced lower employment growth while during the post-crisis period, establishments located in faster growing economies experienced faster employment growth. Moreover, results show that the institutional environment strongly affects business and growth opportunities of establishments, pointing to the important role policy-makers play for creating a business environment that is attractive and conducive to growth. However, the exact direction and scale of the effect again differ across institutions. For instance, business environments with conducive tax regimes in terms of tax rates, the number of number of times the establishment pays taxes or the time taken to prepare, file and pay taxes (i.e. high distance-

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[11] Again, test statitics reported in Table 2 demonstrate that the variable ‚product innovations' needs to be treated as endogenous (the endogeneity test is rejected for all specifications at the 1% or 5% level), that instruments are valid (Sargan test is never rejected) and not weak (Stock-Yogo weak-instruments test is rejected) and that specifications are identified (Anderson's likelihood ratio test is always rejected).

to-frontier rankings) were also conducive to employment growth, particularly during the pre-crisis period. In contrast, business environments that help resolve insolvencies in a quick and costless manner are obstructive to employment growth as they make firing of personnel an administratively and legally easy and costless effort. However, no significant role is observable for business environments that make starting a business a relatively quick and costless endeavor. This seems to suggest that newly entering establishments are very small in size, producing no or only limited demand for additional labor.

8. Summary and conclusion

A quickly growing body of empirical literature finds considerable and robust evidence that establishments face non-negligible financial constraints, which prove detrimental to their performance and growth. These impediments to external funding are particularly worrying in economically lagging economies, where easy and unhindered access to financial markets is not only a crucial factor for the growth and survival of establishments but, more importantly so, for economic growth and catching-up processes with richer economies.

Against this backdrop, the analysis uses a large set of European emerging economies to identify the prevalence and the effects of financing constraints on firm growth, captured in terms of sales growth, on the one hand, and employment growth, on the other. It analyzes and compares the economically more advanced group of NMS-10 (plus Turkey), on the one hand, and the group of economically and financially lagging Western Balkan countries, on the other, to identify whether the consequences of financial constraints differ by the stage of transition of economies. More specifically, it seeks to identify whether financially constrained establishments located in the Western Balkans experience worse growth performances than those located in the NMS-10. It looks at two different types of financing constraints – *constrained* (i.e. lack of application for a bank loan despite the need for external funding) versus *rejected* (i.e. rejection of an application for a bank loan or line of credit) – and two different economic phases – the pre-period (before the onset of the global financial crisis, referring to fiscal year 2007;) and the post-crisis period (the aftermath of the global financial crisis, referring to fiscal year 2011/12).

In line with related empirical evidence, our results highlight that financing constraints significantly obstruct firm growth, the exact effect, however, differs by growth indicator, type of financing constraint and economic period. In general, observable effects are most robust for employment growth, emphasizing that the type of funding constraint matters for firm growth: establishments whose credit applications were rejected had around 6 percentage points lower employment growth rates (this only holds for the post-crisis period, however) while establishments that did not apply for bank loans – despite the need for external funds – had only around 4 percentage points lower employment growth rates (irrespective of the particular economic period considered). Hence, establishments that received a rejection of their credit application experienced lower employment growth than those which, despite the need for external funding, did not apply for a bank loan for reasons pertaining to complex application procedures, unfavorable interest rates, high collateral requirements, insufficient size and maturity of loans or the necessity to make informal

payments to get the loan. Furthermore, results also point to geographic differences in the growth-effects of financing constraints: during the pre-crisis only, financial constraints were more harmful to employment growth of establishments located in the economically less advanced Western Balkan countries than to establishments located in the group of economically more advanced NMS-10 (plus Turkey). These findings demonstrates that in the pre-crisis period, employment growth in the Western Balkan countries was severely hampered by the existence of financing constraints and therefore calls for policy intervention in the Western Balkans aimed at significantly reducing or altogether dismantling existing financing constraints to ensure swifter job-rich growth and catching-up with richer economies.

In addition, the analysis also identifies particular firm characteristics and institutions that matter for firm growth. It consistently shows that, exporters only grow faster – in terms of employment – than domestically-oriented establishments or that, in general, product innovators grow faster than non-innovators. Hence, innovativeness proves to be a recipe for success, guaranteeing more pronounced growth, even during economically difficult times of post-crisis stress. Furthermore, it corroborates the negative size-growth and age-growth hypotheses identified in the literature and highlights that old age or large size are disadvantageous for both sales and employment growth. However, U-shaped relationships are found, suggesting that these negative effects of size and age on growth tend to diminish as establishments grow larger and older, and eventually even reverse. Our findings also highlight that being an importer only or the Top Manager's higher work experience are disadvantages for employment growth. The latter effect is particularly relevant for the post-crisis period, suggesting that more experienced Top Managers probably pursued more conservative and cautious hiring policies during economically still turbulent and uncertain times. Moreover, somewhat surprisingly, foreign ownership is found to be an impediment to both sales and employment growth, resulting in lower growth, at different points in time though: while in the pre-crisis period, a higher foreign ownership was associated with significantly lower employment growth, in the post-crisis period, it was associated with significantly lower sales growth. Hence, foreign ownership is no guarantor for enhanced growth.

Finally, the analysis shows that the state of the economy and the institutional environment matter for establishment growth, a finding that is highly informative and relevant for policy makers that need to develop and implement policies aimed at encouraging (job-rich) growth and fostering swifter catching-up with richer economies. For instance, business environments with favorable tax regimes were conducive to employment growth but obstructive to sales growth – particularly before the global financial crisis hit Central East and Southeastern Europe. Furthermore, business environments that make starting a business a comparatively easy and cheap endeavor were conducive to sales growth – particularly in the pre-crisis period but had no significant effect on employment growth whatsoever. Hence, a business environment that is conducive to starting a business does not automatically guarantee job-rich growth. And business environments that help resolve insolvencies in a quick and costless manner were obstructive to both sales and employment

growth since liquidating an establishment and firing its personnel is guaranteed to be an administratively and legally easy and comparatively costless effort.

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10. Annex

Table A. 1: List of countries included in the analysis, by period

Country	Abbrev.	Number of establishments		
		Pre-crisis period	Post-crisis period	Total
Bulgaria	BG	288	293	581
Czech Republic	CZ	250	143	393
Estonia	EE	273	273	546
Hungary	HU	291	310	601
Lithuania	LT	276	270	546
Latvia	LV	271	336	607
Poland	PL	455	542	997
Romania	RO	541	540	1,081
Slovenia	SI	276	270	546
Slovakia	SK	275	173	448
Turkey	TR	1,151	707	1,858
Albania	AL	175	360	535
Bosnia and Herzegovina	BA	361	360	721
Croatia	HR	159	360	519
Montenegro	ME	116	150	266
Macedonia	MK	366	360	726
Serbia	RS	388	360	748
Kosovo	XK	270	202	472
	Total	6,182	6,009	12,191

Table A. 2: Share of establishments whose loan application was rejected, by some selected firm characteristics and country: pre-crisis

Country	Small	Medium	Large	New-comer (yes=1)	New-comer (no=1)	Majority foreign-owned (yes=1)	Majority foreign-owned (no=1)	Domestic only (yes=1)	Exporter only (yes=1)	Importer only (yes=1)	Exporter & importer (yes=1)	Product innovator (yes=1)	Product innovator (no=1)
BG	24.91	15.37	3.27	0.00	23.12	22.90	20.63	20.73	29.49	0.00	0.00	19.39	23.34
CZ	27.05	15.93	0.96	9.95	25.14	40.23	18.10	28.62	17.38	0.00	6.25	24.52	11.59
EE	14.24	12.51	8.08	41.84	9.27	10.88	13.39	10.63	28.13	0.00	5.32	12.99	14.23
HU	13.02	5.80	6.96	10.55	9.13	10.47	9.13	13.06	0.00	0.00	5.25	7.99	11.91
LT	16.51	9.84	7.52	0.00	16.40	0.00	13.65	18.97	1.18	0.00	9.92	12.78	19.91
LV	34.62	21.46	3.91	34.30	23.77	23.72	25.21	29.41	13.24	61.36	17.84	26.51	18.28
PL	10.66	13.87	8.41	3.82	11.41	.	11.42	9.37	23.03	.	6.67	11.25	10.75
RO	10.19	9.91	7.24	6.00	10.77	12.57	9.31	11.52	2.46	12.65	0.00	8.37	12.84
SI	4.68	13.29	7.01	0.00	7.66	0.00	7.34	6.36	5.75	0.00	12.03	7.52	0.00
SK	15.63	11.76	2.84	1.03	16.34	0.00	13.10	20.03	0.59	0.00	6.35	15.61	5.23
TR	19.69	13.65	15.94	16.73	17.46	10.72	17.49	17.52	19.32	27.76	11.16	19.49	12.71
AL	20.06	24.15	10.78	7.24	24.58	44.36	18.05	20.70	0.00	21.77	22.73	20.40	21.62
BA	15.51	11.33	18.25	13.17	14.28	6.61	14.51	17.24	5.02	12.70	18.46	13.56	18.06
HR	19.38	23.20	12.22	79.38	17.10	63.74	17.97	11.90	33.90	33.71	32.12	14.71	49.91
ME	16.17	13.41	13.34	.	20.28	0.00	15.71	11.63	57.51	5.12	9.78	16.26	4.97
MK	29.21	20.81	6.38	53.78	14.13	0.00	26.39	25.46	20.91	60.55	1.61	28.94	0.62
RS	13.96	15.65	24.12	11.33	16.10	33.64	14.68	15.18	16.03	.	17.28	14.85	18.55
XK	29.09	51.80	23.50	57.16	34.44	.	37.76	56.05	.	30.87	0.00	41.42	7.04

Source: BEEPS 2009, own calculations

Table A. 3: Share of establishments whose loan application was rejected, by firm characteristics and country: post-crisis

Country	Small	Medium	Large	New-comer (yes=1)	New-comer (no=1)	Majority foreign-owned (yes=1)	Majority foreign-owned (no=1)	Domestic firm (yes=1)	Exporter only (yes=1)	Importer only (yes=1)	Exporter & importer (yes=1)	Product innovator (yes=1)	Product innovator (no=1)
BG	11.24	0.09	0.00	0.00	5.08	0.00	4.89	8.26	0.00	0.00	0.00	0.00	5.98
CZ	10.81	17.02	20.51	.	13.93	0.00	16.06	27.52	0.00	46.90	0.00	10.53	15.99
EE	13.64	0.00	0.00	0.00	8.47	16.31	7.03	0.43	25.29	0.00	10.19	6.66	8.68
HU	8.77	0.72	.	22.78	6.82	0.23	9.25	6.91	27.15	0.00	0.00	7.94	8.47
LT	28.23	28.98	30.83	23.15	29.16	5.85	29.04	44.47	17.49	0.00	8.72	17.43	32.86
LV	49.78	23.88	20.82	100.00	30.09	50.01	33.36	33.81	30.10	.	36.28	14.05	47.05
PL	13.42	3.35	0.00	0.00	9.41	11.23	9.01	10.34	4.86	27.65	0.00	3.95	13.13
RO	9.45	8.15	6.26	33.47	7.37	12.12	8.72	9.99	8.28	0.00	4.48	8.98	8.86
SI	3.93	14.15	0.00	0.00	6.16	0.00	6.30	0.00	14.20	0.00	0.23	7.53	4.82
SK	1.94	0.00	0.00	0.00	1.79	0.00	1.91	3.25	0.00	0.00	0.00	0.00	2.75
TR	11.09	.	.	19.44	9.90	0.00	10.64	10.72	0.20	15.14	48.81	33.27	4.11
AL	6.50	0.00	0.00	0.00	4.41	0.00	3.83	0.00	36.44	0.00	0.00	0.00	4.50
BA	7.82	0.45	5.28	0.00	3.98	29.67	2.92	3.60	7.55	0.00	3.53	0.53	7.38
HR	31.24	15.59	19.25	53.14	21.80	0.00	28.79	30.67	5.82	33.37	39.11	20.48	32.47
ME	15.57	0.00	0.00	0.00	11.69	.	11.20	14.88	0.00	0.00	0.00	0.00	12.12
MK	0.26	3.07	0.00	0.00	1.18	.	0.96	0.89	0.00	0.00	5.87	1.39	0.84
RS	3.52	0.00	0.00	1.94	2.58	1.37	2.45	4.09	0.00	0.00	0.00	0.00	4.19
XK	2.27	11.67	0.00	0.00	4.64	.	4.02	3.84	0.00	0.00	17.86	0.00	17.03

Source: BEEPS 2013, own calculations

Table A. 4: Share of establishments that did not apply for a loan or line of credit, despite the need, by firm characteristics and country: pre-crisis

Country	Small	Medium	Large	New-comer (yes=1)	New-comer (no=1)	Majority foreign-owned (yes=1)	Majority foreign-owned (no=1)	Domestic only (yes=1)	Exporter only (yes=1)	Importer only (yes=1)	Exporter & importer (yes=1)	Product innovator (yes=1)	Product innovator (no=1)
BG	39.56	22.87	25.08	56.21	33.97	24.28	37.55	60.87	74.91	24.96	63.06	28.28	46.30
CZ	14.19	15.65	18.89	17.18	14.73	12.99	15.00	80.44	89.65	17.60	80.54	16.06	11.34
EE	21.53	16.10	7.99	12.29	21.26	16.30	20.38	79.72	77.99	80.17	80.57	22.70	12.96
HU	23.77	14.24	3.20	31.33	18.15	1.49	21.67	80.69	71.83	100.00	100.00	16.08	31.57
LT	23.70	12.58	.	10.32	23.49	4.04	21.74	69.61	99.35	100.00	88.81	22.37	7.00
LV	31.20	29.68	24.86	22.73	31.79	25.69	30.81	69.85	79.59	41.05	43.82	31.67	21.60
PL	23.00	23.30	21.10	48.93	21.35	55.78	20.79	75.36	62.08	98.93	94.69	19.21	27.66
RO	30.93	28.26	16.60	34.15	29.44	16.81	31.51	64.11	72.80	16.63	84.40	34.24	25.22
SI	11.23	12.53	13.86	2.58	13.30	4.41	13.03	85.10	91.23	67.91	94.30	13.07	1.66
SK	30.92	26.23	22.62	39.66	27.75	27.32	30.15	71.18	59.89	100.00	63.95	27.87	36.31
TR	18.44	18.35	10.23	5.57	19.89	12.61	18.00	78.22	83.15	76.99	85.26	15.73	20.76
AL	13.91	24.96	0.00	13.11	16.07	0.00	17.62	80.79	100.00	70.37	100.00	16.51	11.18
BA	39.57	41.19	55.51	43.18	41.31	16.25	43.52	55.55	49.77	73.62	50.29	37.84	55.64
HR	26.16	33.27	8.72	0.00	27.95	0.00	29.70	71.23	60.30	59.73	88.31	30.18	19.86
ME	55.62	67.80	12.01	26.40	65.86	0.00	58.47	40.38	77.15	100.00	100.00	30.16	75.62
MK	43.78	30.06	27.67	44.85	37.60	3.24	41.38	55.35	71.52	86.67	65.17	41.47	32.32
RS	45.81	41.48	33.81	41.02	44.43	6.26	48.42	49.55	66.42	45.09	53.89	44.29	42.57
XK	18.13	45.72	6.15	34.31	19.92	100.00	21.42	82.50	35.06	70.86	100.00	24.97	4.13

Source: BEEPS 2009, own calculations

Table A. 5: Share of establishments that did not apply for a loan or line of credit, despite the need, by firm characteristics and country: post-crisis

Country	Small	Medium	Large	New-comer (yes=1)	New-comer (no=1)	Majority foreign-owned (yes=1)	Majority foreign-owned (no=1)	Domestic only (yes=1)	Exporter only (yes=1)	Importer only (yes=1)	Exporter & importer (yes=1)	Product innovator (yes=1)	Product innovator (no=1)
BG	43.12	30.80	38.33	58.58	40.25	25.51	41.45	53.84	81.38	39.96	81.28	46.00	38.53
CZ	7.27	13.63	0.00	0.00	8.49	5.18	9.01	88.90	96.98	82.21	91.15	7.85	8.87
EE	11.17	15.77	10.02	36.69	9.48	21.43	10.80	87.00	80.92	70.66	80.83	8.51	13.78
HU	32.24	41.45	.	47.67	29.78	30.67	32.62	66.83	57.80	65.64	77.13	21.50	34.82
LT	23.24	19.89	3.94	20.40	23.19	8.68	24.22	73.72	73.97	26.32	11.97	33.91	17.91
LV	12.60	13.34	6.01	12.96	12.55	13.26	12.55	80.55	96.10	82.62	69.59	13.31	12.84
PL	12.81	17.57	3.93	0.00	13.57	0.00	14.28	83.77	86.23	100.00	90.22	9.33	15.03
RO	43.34	17.33	30.34	25.44	39.43	18.01	40.83	56.80	87.03	72.37	66.77	49.83	32.76
SI	18.25	21.04	13.85	13.55	19.21	18.56	18.67	86.79	78.00	45.52	67.23	26.89	14.73
SK	19.94	22.55	0.00	39.32	18.50	1.67	23.76	77.92	84.38	98.12	78.28	27.74	17.67
TR	7.48	8.73	.	9.26	7.08	14.21	7.46	88.20	79.10	53.75	90.34	4.26	7.10
AL	23.04	49.09	0.00	13.02	30.57	13.37	26.42	74.45	96.11	63.57	37.56	14.17	27.07
BA	19.18	12.15	48.54	5.08	19.99	1.89	19.90	79.49	73.29	93.27	85.89	12.72	22.46
HR	30.70	26.25	31.37	29.62	29.65	21.19	30.71	61.41	89.89	75.07	61.23	27.61	30.95
ME	45.99	10.19	23.15	42.31	41.45	0.00	42.46	58.14	66.67	51.72	.	9.50	48.61
MK	29.05	18.27	32.62	13.36	31.56	50.65	25.17	71.20	82.59	65.85	54.79	31.68	25.77
RS	46.29	37.36	54.75	33.02	47.30	61.16	43.58	47.28	63.90	76.97	53.84	44.53	44.58
XK	28.32	26.72	87.64	45.11	26.89	.	30.56	63.14	96.89	58.19	70.08	17.49	43.67

Source: BEEPS 2013, own calculations

Table A. 6: Summary statistics – pre-crisis

Variable	Obs	Mean	Std. Dev.	Min	Max
Sales growth	4144	38.45	90.51	-97.94	979.50
Employment growth	3984	12.00	38.70	-88.99	960.66
FC-total	4060	0.20	0.40	0	1
FC-Rejectd	1897	0.14	0.34	0	1
FC-Constrained	2163	0.25	0.43	0	1
Balkan	4144	0.31	0.46	0	1
Log age	4105	2.56	0.70	0	5.20
Log age²	4105	7.03	3.79	0	27.08
Log size	3986	3.38	1.52	0	9.62
Log size²	3986	13.71	11.45	0	92.46
Log years of experience TM	4062	2.75	0.67	0	4.09
Foreign ownership share	4118	8.49	26.08	0	100.00
State ownership share	4118	1.06	7.80	0	99.00
Exporter only	4144	0.18	0.39	0	1
Importer only	4144	0.05	0.21	0	1
Exporter & importer	4144	0.13	0.34	0	1
Big City	4144	0.39	0.49	0	1
Real GDP growth rate	4144	6.26	1.80	1.64	10.94
Paying taxes	3915	63.49	12.64	44.58	84.87
Starting a business	3915	78.13	8.34	60.32	90.83
Resolving insolvency	3915	34.86	11.08	19.89	54.40
Dummy: Manufacturing	4144	0.42	0.49	0	1
Dummy: Construction	4144	0.10	0.30	0	1

Source: BEEPS 2009, own calculations.

Table A. 7: Summary statistics – post-crisis

Variable	Obs	Mean	Std. Dev.	Min	Max
Sales growth	4019	14.59	65.27	-100.00	995.45
Employment growth	3897	3.71	21.61	-75.75	386.48
FC-total	3895	0.21	0.40	0	1
FC-Rejectd	1176	0.07	0.26	0	1
FC-Constrained	2719	0.26	0.44	0	1
Balkan	4019	0.39	0.49	0	1
Log age	4000	2.64	0.61	0	5.02
Log age²	4000	7.31	3.21	0	25.24
Log size	3899	2.91	1.28	0	9.04
Log size²	3899	10.11	9.12	0	81.72
Log years of experience TM	3947	2.81	0.62	0	4.09
Foreign ownership share	3995	7.72	25.26	0	100.00
State ownership share	3995	0.39	5.11	0	99.00
Exporter only	4019	0.16	0.37	0	1
Importer only	4019	0.05	0.22	0	1
Exporter & importer	4019	0.11	0.31	0	1
Big City	4019	0.24	0.43	0	1
Real GDP growth rate	4019	1.94	2.12	-1.74	6.72
Paying taxes	4019	67.60	11.58	48.93	82.07
Starting a business	4019	86.48	7.92	62.44	96.13
Resolving insolvency	4019	38.82	9.93	24.00	60.32
Dummy: Manufacturing	4019	0.39	0.49	0	1

| Dummy: Construction | 4019 | 0.08 | 0.28 | 0 | 1 |

Table A. 8: Correlation matrix – pre-crisis

	FC-total	Balkan	Log age	Log age²	Log size	Log size²	Log expTM	For-Share	State-Share	Exp-only	Imp-only	Exp-Imp	Big City	GR-rgdp	Tax	Start	Insolv	Manuf	Constr
FC-total	1																		
Balkan	0.113	1																	
Log age	-0.007	0.084	1																
Log age²	-0.004	0.108	0.974	1															
Log size	-0.104	-0.056	0.342	0.362	1														
Log size²	-0.085	-0.045	0.342	0.367	0.968	1													
Log expTM	-0.018	-0.051	0.224	0.186	0.031	0.015	1												
ForShare	-0.053	-0.024	-0.047	-0.038	0.215	0.223	-0.103	1											
StateShare	0.030	0.078	0.141	0.166	0.157	0.175	0.016	-0.018	1										
Exponly	-0.038	0.011	0.024	0.021	0.078	0.070	0.036	0.041	0.016	1									
Imponly	0.007	0.044	-0.002	0.002	0.034	0.031	0.016	-0.037	0.005	-0.100	1								
ExpImp	-0.027	0.010	0.136	0.146	0.273	0.268	0.014	0.144	0.017	-0.195	-0.082	1							
Big City	0.007	0.014	0.019	0.022	0.081	0.082	0.058	0.081	-0.033	0.059	0.030	-0.011	1						
GRrgdp	0.027	-0.318	-0.092	-0.096	-0.007	-0.012	-0.125	0.003	-0.053	-0.030	0.020	0.001	0.067	1					
Tax	-0.070	-0.323	-0.001	-0.012	0.062	0.056	-0.009	0.016	-0.044	0.040	0.005	0.055	0.142	0.425	1				
Start	-0.026	-0.402	-0.090	-0.098	0.085	0.076	-0.025	-0.011	-0.064	-0.016	0.002	-0.014	0.227	0.365	0.399	1			
Insolv	-0.022	-0.022	-0.071	-0.072	-0.077	-0.072	-0.106	0.067	0.012	-0.007	-0.030	-0.028	-0.262	0.152	0.279	-0.445	1		
Manuf	0.013	-0.075	0.101	0.107	0.189	0.166	0.039	0.018	-0.023	0.004	0.209	0.448	0.031	-0.015	0.075	0.137	-0.197	1	
Constr	-0.002	0.036	0.036	0.037	0.072	0.064	0.039	-0.049	0.025	-0.065	-0.060	-0.125	-0.030	-0.004	0.004	-0.071	0.099	-0.284	1

Source: BEEPS 2009, own calculations.

Table A. 9: Correlation matrix – post-crisis

	FC-total	Balkan	Log age	Log age²	Log size	Log size²	Log expTM	For-Share	State-Share	Exp-only	Imp-only	Exp-Imp	Big City	GR-rgdp	Tax	Start	Insolv	Manuf	Constr
FC-total	1																		
Balkan	0.079	1																	
Log age	-0.052	-0.074	1																
Log age²	-0.050	-0.059	0.980	1															
Log size	-0.106	-0.086	0.270	0.284	1														
Log size²	-0.101	-0.086	0.258	0.278	0.969	1													
Log expTM	-0.016	-0.071	0.280	0.253	0.061	0.039	1												
ForShare	-0.047	-0.057	-0.057	-0.058	0.234	0.243	-0.094	1											
StateShare	0.025	-0.002	0.102	0.121	0.130	0.144	-0.016	-0.009	1										
Exponly	-0.046	-0.057	0.027	0.022	0.087	0.069	0.018	0.116	0.000	1									
Imponly	0.017	0.061	0.004	0.000	0.012	-0.005	-0.003	-0.018	-0.016	-0.106	1								
ExpImp	-0.024	-0.027	0.057	0.072	0.264	0.260	0.015	0.151	-0.002	-0.151	-0.082	1							
Big City	-0.025	0.001	-0.072	-0.062	0.015	0.026	-0.038	0.109	-0.025	0.083	-0.011	-0.044	1						
GRrgdp	-0.106	-0.344	-0.049	-0.046	-0.036	-0.038	-0.011	-0.054	-0.025	0.022	0.004	-0.071	0.203	1					
Tax	-0.053	-0.165	-0.005	0.008	-0.036	-0.029	0.041	-0.034	-0.016	0.070	-0.008	-0.005	0.076	0.460	1				
Start	0.015	-0.333	-0.002	-0.002	-0.028	-0.008	0.033	0.042	-0.005	0.044	-0.077	0.017	0.116	-0.023	0.244	1			
Insolv	-0.044	-0.150	-0.011	-0.015	-0.023	-0.010	-0.061	0.063	-0.002	0.018	0.009	0.058	0.026	-0.040	0.266	0.126	1		
Manuf	0.007	-0.057	0.044	0.059	0.156	0.135	0.055	0.036	-0.004	0.012	0.262	0.397	-0.027	0.141	0.072	0.015	-0.066	1	
Constr	0.013	-0.026	0.002	0.000	0.055	0.053	0.047	-0.050	0.011	-0.064	-0.068	-0.093	-0.019	-0.023	-0.017	0.001	0.016	-0.239	1

Source: BEEPS 2013, own calculations.