



# **BUSINESS RESILIENCE IN THE PANDEMIC AND BEYOND**

Adaptation, innovation, financing  
and climate action from  
Eastern Europe to Central Asia



## Chapter 4 **Financial deepening and firms' access to finance**

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### **Contributors**

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#### **Executive Summary:**

- Chapter I:** Laura Valderrama (IMF, chapter leader), Grace Li, Jorge Salas (all IMF), Zsóka Kóczán (EBRD), Péter Harasztosi and Simon Savšek (all EIB)
- Chapter II:** Rozália Pál (EIB, chapter leader), Matteo Ficarra, Meryem Gökçe Gökten, Péter Harasztosi and Christoph Weiss (all EIB)
- Chapter III:** Helena Schweiger (EBRD, chapter leader), Vincenzo Langella (EBRD), Sofia Dominguez, Matteo Ferrazzi, Fotios Kalantzis and Annamaria Tueske (all EIB)
- Chapter IV:** Luca Gattini (EIB, chapter leader), Ozan Akbas, Koray Alper, Emanuela Benincasa, Frank Betz and Emmanouil Davradakis (all EIB)

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The views expressed in this publication are those of the authors and do not necessarily reflect the position of the EIB, EBRD or IMF.

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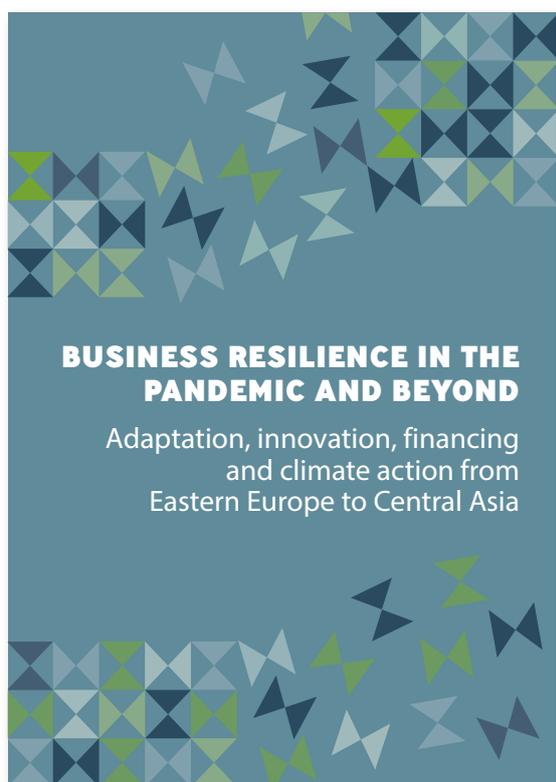
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# Chapter 4

## **Financial deepening and firms' access to finance**

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## CHAPTER IV

# Financial deepening and firms' access to finance

## Summary

*Despite a successful transformation over the past 30 years, significant gaps in financial deepening and firms' access to finance still affect the economies of Eastern Europe and Central Asia. Credit constraints are particularly binding for small and medium-sized enterprises (SMEs), and young and innovative firms. This chapter analyses the associations between bank credit, firm characteristics and firms' financing choices. It also introduces the concept of financial autarky, which refers to firms that are fully self-financing. Higher levels of autarky are associated with less developed institutional frameworks: the peaks are in the sub-regions of the Eastern Neighbourhood and Central Asia, while lower levels are recorded in Central and Eastern Europe, Russia, the Western Balkans and Turkey. The large majority of these firms are voluntarily autarkic: they choose to function without the support of the financial system. Financial autarky is also a function of firm characteristics: more sophisticated, larger, older and export-oriented firms are less likely to be autarkic. Autarky is particularly present among SMEs and young firms.*

*Low levels of financial deepening, financial constraints on firms and financial autarky might be due to both demand and supply factors. While fully disentangling them is difficult, the analysis in this chapter establishes that credit availability for firms is associated with investment and growth, thus showing the economic gains of being supported by and connected to the banking sector. Credit-constrained firms invest less than unconstrained firms. A simulation exercise suggests that removing credit constraints can boost aggregate growth over a ten-year horizon, especially in the Eastern Neighbourhood and Central Asia. Moreover, access to credit is associated with faster growing firms. Conversely, financial autarky is associated with a lower propensity to invest and lower employment growth: firms choosing to remain disconnected from the financial sector end up losing growth opportunities. Using firm-level information, the chapter quantifies credit gaps in the region, which are largely associated with constraints that affect SMEs. Additional credit worth 17-20% of GDP would be needed to meet the financing needs of enterprises across the whole region. Results differ across sub-regions, with Central and Eastern Europe and the Western Balkans having smaller gaps.*

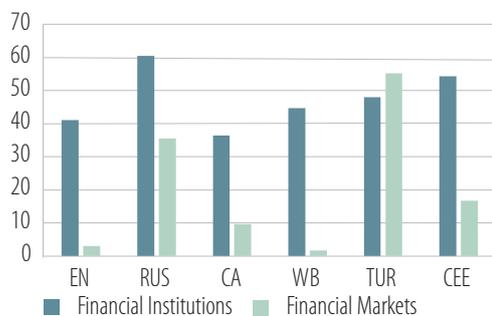
*The documented gaps are mostly linked to a mismatch between demand and supply: re-aligning the two requires increased institutional focus on credit market infrastructure. Improvements in collateral frameworks can help to tackle inefficiencies in the allocation of credit, reduce risks and increase the accessibility of credit. Targeted financial and advisory support can reduce constraints and increase firms' investment opportunities, particularly for SMEs and young and innovative firms. Further diversification in terms of financial instruments and products is warranted. For example, the deployment of guarantee schemes can boost the risk-taking appetite of banking sectors, while their effectiveness can be enhanced via better risk assessment and screening capabilities. Moreover, financial literacy as well as improvements in audit and accounting standards, in conjunction with a genuine reform agenda geared to improving institutional quality, can reduce information asymmetries and increase firms' capacity, appetite and confidence in engaging with the banking sector.*

## 4.1. Introduction

**Financial sectors in the region are at different stages of development, but they all remain essentially bank-based.** Bank debt is still by far the most important source of external finance for many firms, including SMEs. Alternative sources of finance are scarce. The IMF Financial Development Index (which captures the depth, access and efficiency of financial institutions and markets) shows that countries' financial institutions are much more developed than their financial markets, with the exception of Turkey and, to some extent, Russia (Figure 1).<sup>1</sup> Capital markets remain underdeveloped and the availability of venture capital, private equity and leasing is very limited.

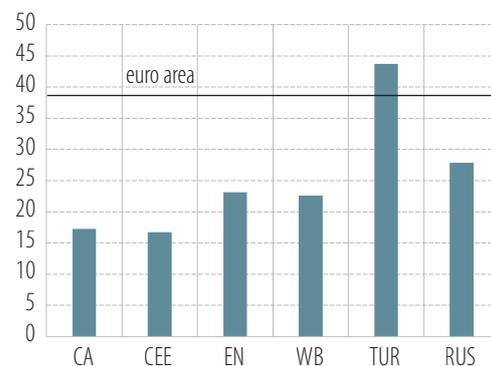
**Over the past 30 years, banking sector penetration has grown fast, with a booming phase, followed by some rebalancing after the global financial crisis of 2007-09.** In Central and Eastern Europe and the Western Balkans, as a consequence of the privatisation process, foreign banks entered the market, bringing new banking practices and capital, and funding relatively fast, mostly foreign exchange-based credit growth. The global financial crisis triggered a rebalancing, with more focus on domestically funded, and thus more moderate, growth. Similar paths have been followed in Turkey, Russia and Kazakhstan. In those countries, boom-bust phases have been somewhat more pronounced, while foreign banks were competing with dominant, domestic, often state-controlled banks. In the Eastern Neighbourhood and Central Asia, the transformation has been somewhat slower, both in terms of institutional development and growth, resulting in lower levels of financial sector penetration today.

**Figure 1**  
Financial institutions and financial market development; (0-70, best)



Source: IMF Financial Development index  
Note: Average country within each sub-region; latest data 2018

**Figure 2**  
Credit to non-financial corporations (including SMEs) as a percentage of GDP



Sources: IMF Financial Soundness Indicators (FSI); IMF Financial Access Survey (FAS); national central banks  
Note: A detailed country breakdown, including household credit, is in Annex A, Figure A.5; latest data 2019.

**The positions of the region's banking sectors had improved prior to the COVID-19 crisis.** Overall, banking systems in the area tend to be relatively well capitalised, with improved regulatory capital positions in all sub-regions (see Annex A, Figure A.4 for country details). The banking sectors can count on a solid base of domestic deposits, but there are still sources of vulnerability in loan-to-deposit ratios of over 100% in Turkey, Russia and Central Asia, as well as liability dollarisation/euroisation (see Box 2) in Turkey, Central Asia, the Western Balkans and the Eastern Neighbourhood. Banking systems are generally profitable, with relatively low levels of non-performing loans. The latter have decreased in many countries and are now close to levels observed prior to the global financial crisis in essentially all sub-regions (see Annex A, Figure A.1).<sup>2</sup>

1 Specifically, the index shows how, on average, financial institutions are better developed in Central and Eastern Europe, the Western Balkans, Russia and Turkey, while still lagging in the Eastern Neighbourhood and Central Asia. Financial markets are underdeveloped in the Western Balkans and the Eastern Neighbourhood as well as Central Asia. Central and Eastern Europe still ranks at a relatively low level in terms of financial markets development, albeit markedly higher than the other regions, excluding Russia and Turkey. For details on the construction of the index, see Svirydenka (2016); and IMF Staff Discussion Note 'Rethinking Financial Deepening: Stability and Growth'.

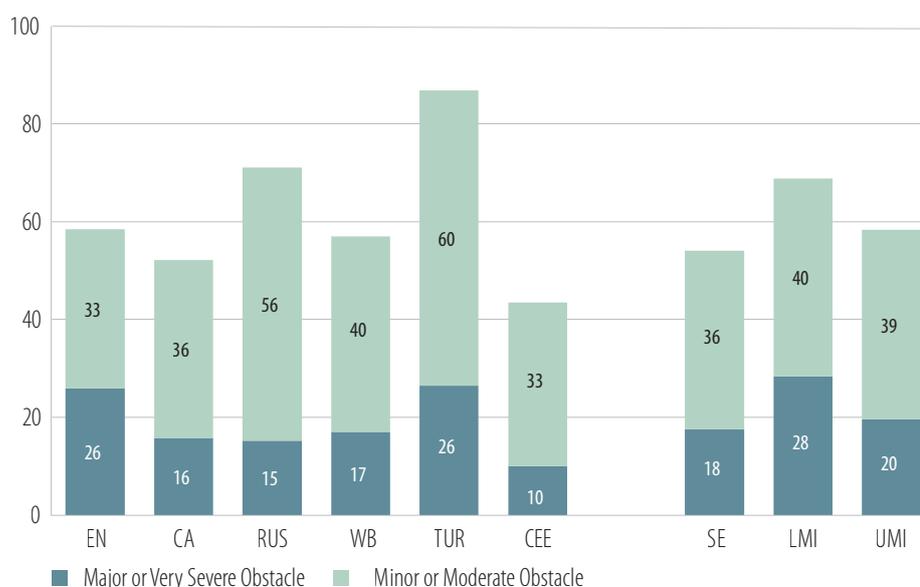
2 Ukraine, where non-performing loans are still close to 50% of the loan portfolio, drives the higher non-performing loan figures in the Eastern Neighbourhood, while the other banking sectors in that sub-region operate at substantially reduced levels of non-performing loans (see Annex, Figure A.1).

**Eastern Europe and Central Asia still seem to have a credit penetration gap in the enterprise segment.** In 2008, the ratio of credit to GDP was about 70% for the average country in Central and Eastern Europe, and 40-50% for all the other sub-regions, with Central Asia lagging (see Annex A, Figure A.3). The global financial crisis, as well as idiosyncratic and localised crises,<sup>3</sup> has hampered economic and financial stability. Subsequently, credit penetration has stalled in the Eastern Neighbourhood and declined somewhat in Central and Eastern Europe, the Western Balkans and Central Asia.<sup>4</sup> In 2019, loans to non-financial corporations were 15-28% of GDP in Eastern Europe and Central Asia, except Turkey (Figure 2). This compares with a ratio of roughly 38% for the euro area.<sup>5</sup> The penetration potential should also be matched with the available local saving capacity and domestic funding space. They both appear somewhat limited in the region as a whole, notably in Central Asia,<sup>6</sup> Turkey and Russia, and, to a certain extent, in the Eastern Neighbourhood as reflected in relatively high loan-to-deposit ratios (see Annex A, Figures A.1 and A.2).

**Low credit penetration mirrors a relatively high share of firms that perceive access to finance as an obstacle.** On average in the Eastern Neighbourhood, Central Asia and the Western Balkans, 50-60% of firms consider access to finance as an obstacle. In Central and Eastern Europe, this share is slightly lower, at around 40%. It is significantly higher in Turkey and Russia (Figure 3).

**Figure 3**

**Access to finance as an obstacle to firms' operations (percentage of firms)**



*Source:* Authors' calculations based on the 2019 EIB-EBRD-WBG Enterprise Survey (ES)

*Note:* Access to finance is scored as a standalone obstacle – results for no obstacle are not reported

3 Over the past decade, these include, but are not limited to, banking sector crises, armed conflicts and debt restructuring.

4 Sharp currency devaluations and idiosyncratic shocks coupled with structurally low saving rates and volatile inflation have further weighted negatively on many sub-regions. At the other end of the spectrum, the credit-to-GDP ratio has been increasing significantly in Turkey and Russia. But this went hand in hand with high and further increasing loan-to-deposit ratios in Turkey, thus signalling a potential build-up of imbalances.

5 The two principal components of loan stocks are outstanding credit to households and non-financial corporations. The ratio of household to non-financial corporations' outstanding credit was about 1.3 in the euro area in 2019. It was lower in Eastern Europe and Central Asia with the only exception of Central and Eastern Europe, where it was 2.5 – thus indicating a banking sector structurally more tilted towards consumer lending and mortgages. This could be the result of many different factors, including, but not exclusively, prudential/regulatory policies, differences in consumption patterns and consumer purchasing preferences as well as developments in the local housing markets.

6 The Central Asia figures are largely driven by a high loan-to-deposit ratio in Uzbekistan.

**The rest of the chapter is divided into four sections.** Section 4.2 explores the market for bank credit in the region, employing the concept of financially constrained firms and introducing the concept of firms operating in financial autarky. Section 4.3 analyses the effects of financial constraints and financial autarky, revealing the associations between firms' propensity to invest, growth and access to credit. It also shows that autarkic firms, controlling for their age, tend to be smaller and employ fewer people. Against this backdrop, Section 4.4 builds a link between firm-level information and the macroeconomic dimension, documenting the existence of aggregate credit gaps, largely driven by SMEs. Section 4.5 concludes.

**The chapter also includes three boxes.** Box 1 describes the key concepts of credit-constrained firms and financial autarky. Box 2 analyses the issue of dollarisation/euroisation in the local financial sector. Box 3 examines the effects of extreme weather events on firms' investments and financing.

## 4.2. Firms, banks, credit constraints and financial autarky

**In largely bank-based systems, bank credit is the most important source of external finance for many firms.** Therefore, understanding whether firms that need loans are able to obtain them is of particular interest. Box 1 provides a taxonomy of firms based on the extent to which they want to access bank credit and are able to do so. Figure 4 shows the percentage of firms needing loans by sub-region. It distinguishes firms that need loans and applied for them from those that needed loans and did not apply. Overall, the share of firms stating that they need loans is highest in Turkey (64%), followed by Russia (58%) and the Eastern Neighbourhood (54%), while the need is lower in the Western Balkans and Central and Eastern Europe.<sup>7</sup>

### 4.2.1. Credit-constrained firms

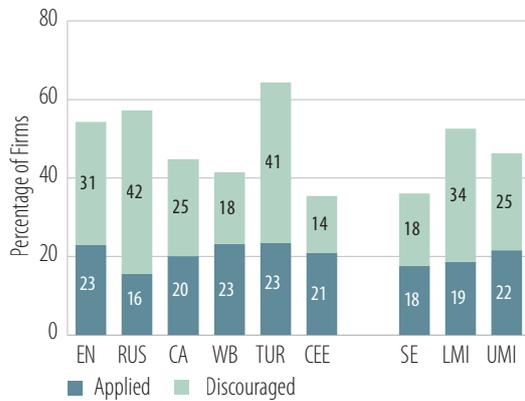
**Of firms in need of loans across Eastern Europe and Central Asia, 45-73% are unable to obtain one and are thus credit-constrained.** Credit-constrained firms are defined as firms that need loans but are either refused or discouraged from applying.<sup>8</sup> Figure 5 provides evidence of the prevalence of credit constraints in the region. According to the survey, 70% of Russian firms in need of loans are credit-constrained, exceeding the average for upper-middle-income countries (47%) by a significant margin. Close to 65% of firms in the Eastern Neighbourhood and Central Asia are credit-constrained. In Turkey, the high level of credit-constrained firms is largely associated with the timing of the survey, which was conducted during a period of acute crisis in the country. At the other end of the spectrum, the Western Balkans (34%) and Central and Eastern Europe (36%) have the lowest share of credit-constrained firms, suggesting that they have better functioning banking sectors. The vast majority of credit-constrained firms are discouraged. Rejections, on the other hand, are rather rare across all sub-regions.

7 In Turkey, the share of firms needing loans increased by 21 percentage points relative to the previous survey carried out in 2013 (check date). Despite the significant increase in needs, the share of firms that applied decreased. But discouragement levels are, on average, equal to or higher than loan applications.

8 See EIB (2021) for a comparative discussion of credit constraint indicators in the EIB Investment Survey, the ECB Survey of Access to Finance of Enterprises and the Enterprise Survey. Gorodnichenko and Schnitzer (2013), Popov and Udell (2012), and Kuntchev et al (2014) measure credit constraints using the Enterprise Survey. Additional survey-based work includes Schaller (1993), Ferrando and Mulier (2015) and García-Posada Gómez (2019).

**Figure 4**

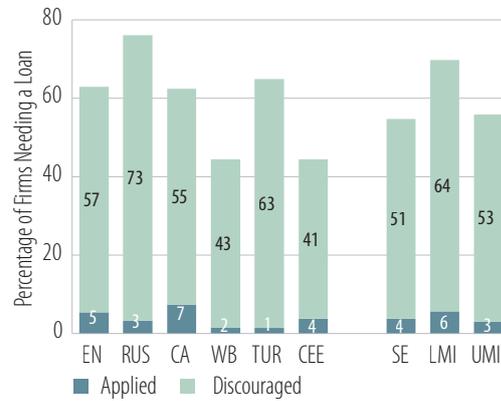
**Firms in need of loans** (those that applied plus those that were discouraged from applying)



Source: Authors' own calculations based on EBRD-EIB-WBG Enterprise Survey

**Figure 5**

**Credit-constrained firms as a share of firms needing loans**



Source: Authors' own calculations based on EBRD-EIB-WBG Enterprise Survey

**SMEs and young firms are more likely to be credit-constrained.** While 24% of SMEs are credit-constrained, this applies to only 16% of large firms. Similarly, only 37% of SMEs have loans outstanding, compared with 55% of large firms. When it comes to age, 27% of firms under five years old are credit-constrained, compared with 20% of firms aged over five. Data on outstanding loans suggest a steeper gradient. Only 29% of firms below age five have loans outstanding compared with 39% above age five. Those results are shown in Table 1, the rows of which break down the population of firms by firm characteristics. The columns of Table 1 measure firms' ability to access finance. Firm size and age are associated with access to finance.<sup>9</sup> Table B.1 in Annex B supports this evidence. It shows that younger firms are somewhat more in need of loans, and that smaller firms are statistically and economically more constrained than medium and large firms due to higher levels of both rejections and discouragement. In addition, firms with audited financial statements are less likely to be credit-constrained, while the opposite applies to firms that operated informally before registering.

<sup>9</sup> The Enterprise Survey uses stratified random sampling, with samples stratified by country, sector, region with a country and size. The size classes used are 5-19, 20-99 and 100+ employees – the last category representing large firms.

**Table 1**  
**Firm characteristics and financial structure (percentage of firms)**

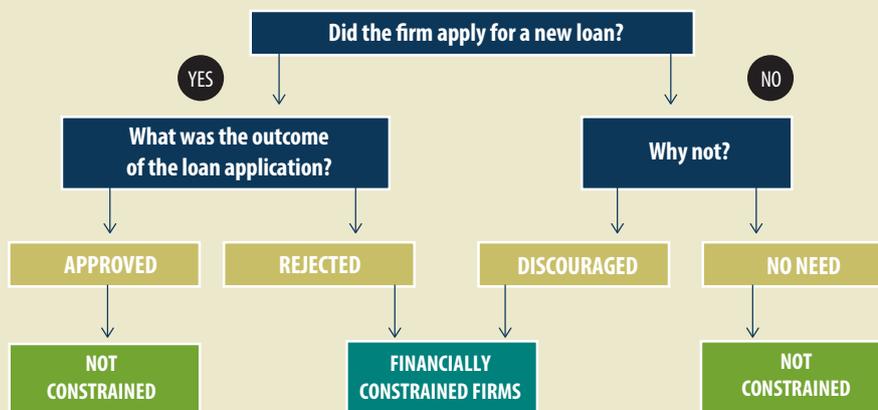
		Credit Constrained	Rejected	Discouraged	Need a Loan	Has a Loan
Size	SME	24	2	22	42	37
	Large	16	1	15	52	55
Age	<5 Years	27	3	23	43	27
	>=5 Years	23	2	21	42	39
Innovator	Yes	20	2	18	45	46
	No	26	1	24	40	32
Website	Yes	21	1	19	42	42
	No	28	3	25	43	30
Foreign Tech. License	Yes	19	1	18	45	45
	No	24	2	22	42	37
Informal	Yes	32	1	30	49	42
	No	23	2	21	42	38
Exporter	Yes	16	2	14	46	52
	No	25	2	23	41	36
<i>Degree of sophistication and compliance</i>						
ESG	Higher	21	2	18	44	43
	Lower	26	1	24	41	33
Audited	Yes	20	2	18	44	46
	No	25	2	23	42	34
Offering Formal Training	Yes	20	2	18	45	44
	No	25	1	23	41	35
Other						
Foreign Ownership	Yes	15	1	14	33	34
	No	24	2	22	43	38
Female CEO	Yes	23	2	21	40	32
	No	24	2	22	43	39
EAST & SE 2019		23	2	21	43	38

Note: "Informal" refers to firms that were operating originally in the informal sector when they were created

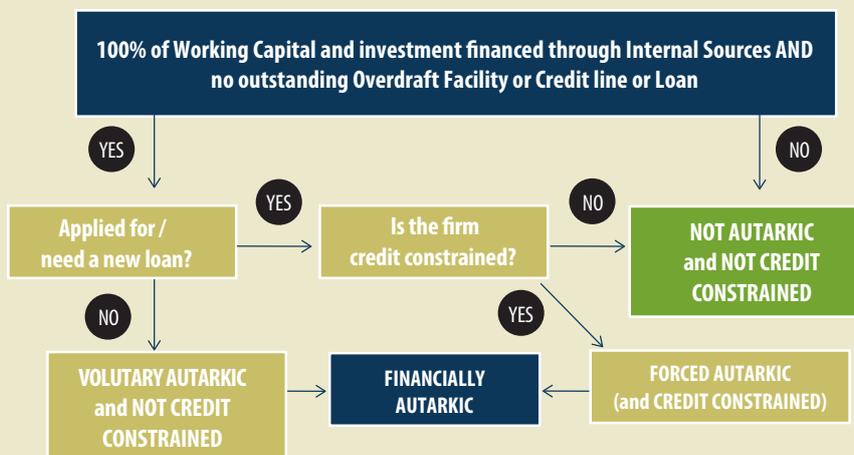
**Box 1****Firms that are credit-constrained, discouraged, rejected and autarkic – a primer**

The figures below illustrate the key concepts employed throughout this chapter to characterise firms' based on their access to finance: (i) credit-constrained firms; and (ii) firms in financial autarky.

**Credit-constrained firms are firms that need loans but were either discouraged from applying or rejected.** First of all, firms in need of loans are defined as those that applied for loans and those that did not apply because they were discouraged from doing so. In other words, discouraged firms need loans but have refrained from applying because of what they perceive as complex application procedures, unfavourable interest rates, high collateral requirements, insufficient loan amounts, fear of being rejected or other, unspecified reasons. Rejected firms are those that applied for loans and saw their application declined. The firms that got their loan applications approved and those that did not apply because they have no need are not credit-constrained. Firms that had the application approved "in part" or "withdrawn" by the borrower are also not credit-constrained.



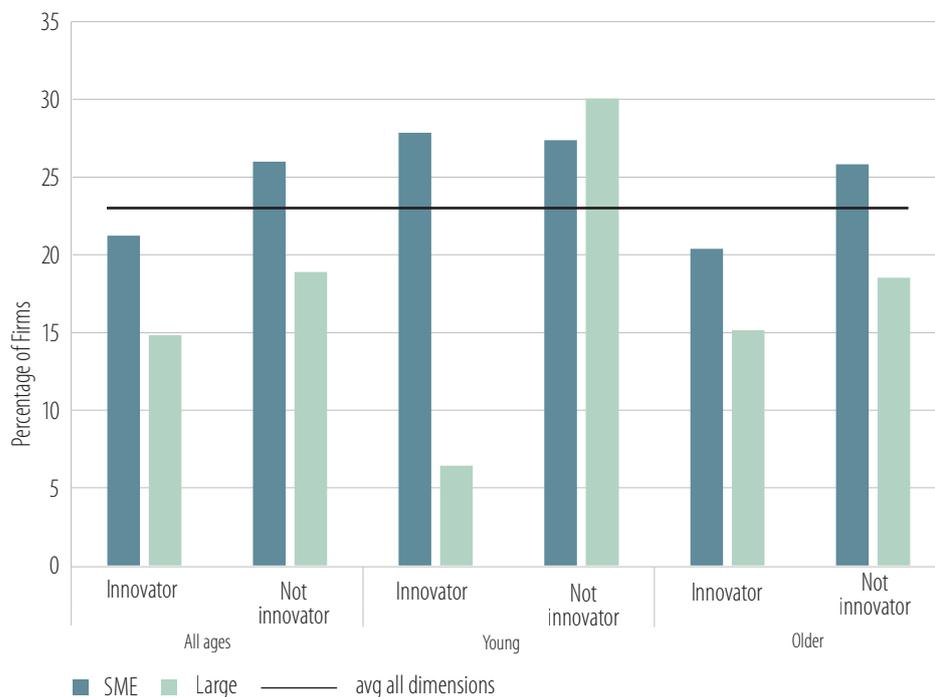
**Firms in financial autarky are those that have no liability relationship with the banking sector.** These firms: (i) finance their working capital and investment entirely with internal sources (this definition excludes, for example, firms that use supplier credit to finance their working capital); and (ii) have no outstanding loan, credit line or access to an overdraft facility. The vast majority of autarkic firms in the sample are voluntarily autarkic: they have chosen to disconnect from banks. Conversely, forced autarkic firms are those that are autarkic out of necessity, while still defined by criteria i) and ii), rather than choice: they have applied for loans and been rejected or they have not applied because they have been discouraged from doing so. Forced autarkic firm are fully credit-constrained, whereas the voluntarily autarkic are not.



**This evidence testifies to the importance of “information asymmetries” in the credit market.** SMEs, and in particular firms that have a history of informality, are often more opaque than large firms. Their opaqueness makes it difficult for a bank to assess their creditworthiness. The same applies to young firms since they lack a credit history.<sup>10</sup> Conversely, having audited financial statements mitigates asymmetric information as it enables firms to signal their creditworthiness credibly. Along these lines, on average, firms with less developed environmental, social and governance practices (ESGs) are somewhat more credit-constrained, thus signalling some tentative correlation between higher ESG standards and access to credit.<sup>11</sup>

**Innovative firms seem to be generally less constrained than those that are not innovative, particularly larger firms; but innovative SMEs are still significantly credit-constrained, particularly young innovative SMEs.** Table 1 shows that, on average, innovative firms are less likely to be credit-constrained.<sup>12</sup> This calls for further investigation, adding more granularity to the finding. Figure 6 shows the differences in credit constraints between SMEs and large firms and, within those, controlling for their age and innovation status. Innovative large firms are significantly less constrained than innovative SMEs, with the latter showing 6 percentage points higher levels of constraints. The average level of constraints for innovative SMEs does not differ significantly from the average for all SMEs reported in Table 1, and it is above the average level of constraints for all firms. Moreover, younger innovative SMEs are five times more constrained than young innovative large firms. In addition, more mature innovative SMEs exhibit higher levels of constraints than larger firms. All in all, SMEs are significantly more constrained than larger firms, and younger and innovative SMEs even more so, thus calling for targeted support.

**Figure 6**  
Credit constraints: breakdown by innovators, firm age and size

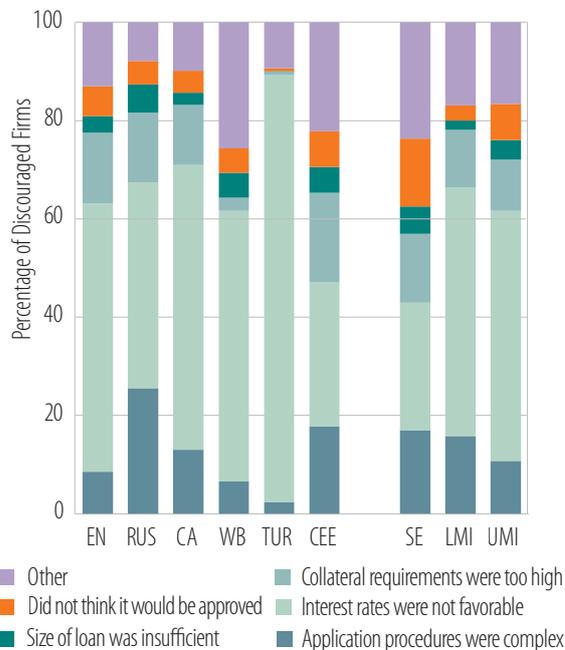


Source: Authors' own calculations based on EBRD-EIB-WBG Enterprise Survey

10 Young firms are defined by age buckets (see Table 1) with a cut-off at five years of firms' operating age.  
 11 Leveraging Enterprise Survey data, Chapter 3 of this report proposes a firm-level “Corporate ESG Responsibility” composite indicator. To build the indicator, 45 questions were employed. They relate to environmental, social and governance practices (for example, green management, green investments, gender, education, general governance, audit, etc.). The indicator is particularly useful as it covers SMEs in emerging markets, while ESG information is in general very scarce and available only for (mainly large) listed firms.  
 12 See Chapter 2 of this report for the definition of innovative firms.

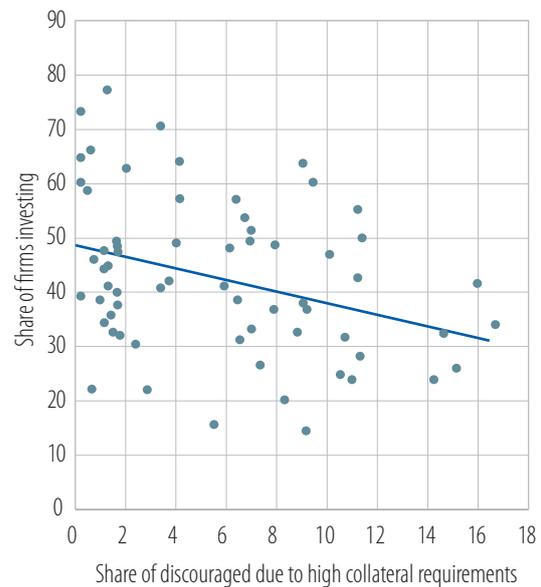
**Several factors contribute to firms being discouraged from applying for loans**, as shown in Figure 7. Given the high share of discouraged firms among credit-constrained firms, it is useful that the survey provides additional information on why firms are discouraged. Figure 7 shows that firms most frequently cite high interest rates as the reason why they did not apply for loans. But the relative importance of high interest rates differs across sub-regions. In Turkey, almost all discouraged firms are discouraged by high interest rates. In Central and Eastern Europe, high interest rates are still the most frequently cited factor, but complex application procedures and stringent collateral requirements are also important. The other sub-regions fall in between. In this context, it is important to note that complaints about high interest rates cannot be viewed in isolation from the returns that firms are able to generate from their assets. Firms discouraged by high interest rates implicitly state that their marginal cost of funding is high relative to the marginal return on capital.

**Figure 7**  
Factors discouraging firms from applying for loans



Source: Authors' own calculations based on EBRD-EIB-WBG Enterprise Survey

**Figure 8**  
Association between investing firms and broad stringency of collateral requirements



Source: Authors' own calculations based on EBRD-EIB-WBG Enterprise Survey

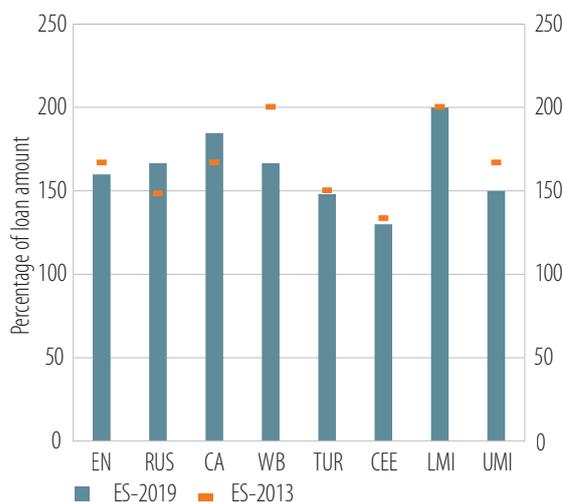
**Discouragement levels due to high collateral requirements are associated with lower investment levels.** Figure 8 associates the firms' propensity to invest with the stringency of collateral as a constraining element on firms applying for loans. The latter can be interpreted as a structural feature of financial sector infrastructure that hampers firms' connectedness, thus constraining them. As a result, firms invest less in countries with higher shares of firms declaring collateral as a discouragement factor, underscoring the importance of financial infrastructure development, notably collateral frameworks, in helping firms to be better connected to the financial sector, ultimately to support their investment opportunities.

**Intensive and extensive margins of collateral are still elevated in many sub-regions.** The percentage of loans requiring collateral ranged between 38% (Turkey) and 90% (Central Asia) of the firms with loans in 2019. The value of the loan required as collateral or intensive margin of collateral is still high, with requirements above 100% for many firms (Figure 9), possibly reflecting a scarcity of high value collateral

assets and a lack of either secondary markets for collateral where collateral could be priced or collateral evaluation capacity among credit officers in banks. The median value of collateral as a percentage of loans decreased in the Western Balkans between the two most recent Enterprise Survey waves and remains rather low in Central and Eastern Europe, where there is an European Investment Fund (EIF) presence and established domestic credit guarantee schemes. Collateral requirements are higher in Central Asia and the Eastern Neighbourhood, where credit enhancement schemes are absent or less endowed, with the top 75% percentile still very high.

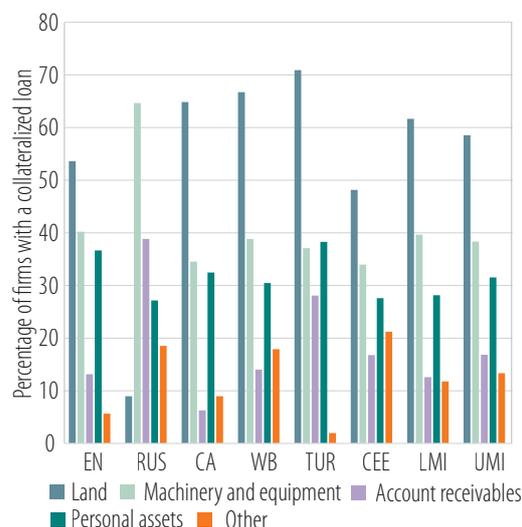
**Among the different types of collateral, land and buildings** remained the main asset pledge either standalone or with other assets in 2019. Machinery and equipment are the second most relevant, together with personal assets. Central and Eastern Europe and the Eastern Neighbourhood (where some collateral reforms have been enacted) require less land and buildings, which are probably perceived as the most liquid/safe form of collateral (Figure 10).

**Figure 9**  
Value of collateral needed for a loan as a percentage of the loan amount (%)



Source: Authors' own calculations based on EBRD-EIB-WBG Enterprise Survey 2013 and 2019

**Figure 10**  
Different types of collateral, 2019



Source: Authors' own calculations based on EBRD-EIB-WBG Enterprise Survey

## 4.2.2. Financial autarky

**An average of 40% of firms in the region are fully self-financing; in other words, they are financially autarkic.** Broadly speaking, firms' levels of financial autarky reflect the interplay of investment opportunities, profitability (ability to generate funds) and the availability of external finance. Figure 11 shows that the share of autarkic firms is highest in Central Asia (56%), followed by the Eastern Neighbourhood (47%). At 7%, Turkey records the lowest share of autarkic firms. The share is also relatively low in the Western Balkans, Russia and Central and Eastern Europe, underscoring a better connection of firms to the financial sector and reconfirming the results in the discussion of financial constraints above. By way of comparison, it is important to note that the phenomenon of zero-leverage firms is not limited to small firms in middle-income countries: zero-leverage firms account for 10% of listed US firms.<sup>13</sup>

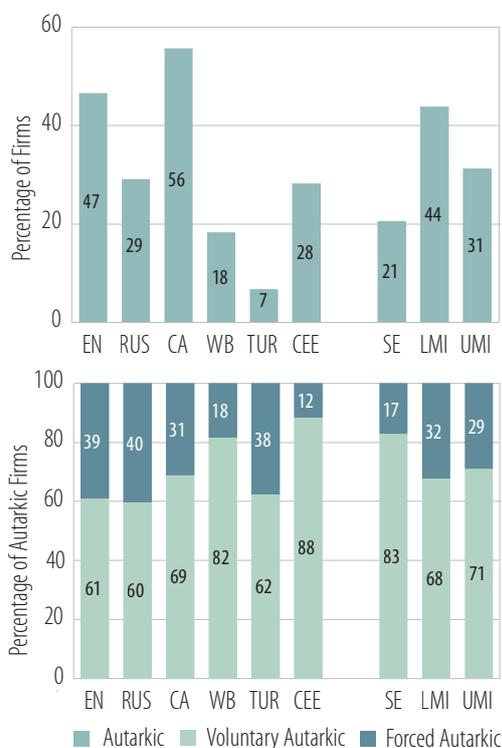
**The majority of financially autarkic firms are voluntarily autarkic.** Figure 11 provides information on the relative importance of voluntarily and forced autarkic firms. Across all sub-regions, the majority of

13 In advanced economies, zero leverage is often connected to under-diversified managers and shareholders; see Strebulaev and Yang (2013).

financially autarkic firms are voluntarily autarkic. At 88% of autarkic firms, the share of voluntarily autarkic firms is highest in Central and Eastern Europe, followed by the Western Balkans with 82%. Conversely, Russia (60%) and the Eastern Neighbourhood (61%) have the lowest share of voluntarily autarkic firms.

**Forced autarky is a transitory state.** Figure 12 combines data from the 2013 Enterprise Survey wave with the latest wave, thus building a panel, to examine the persistence of financial autarky. In particular, Figure 12 captures how firms make a transition between states from one survey wave to the next. For example, 35% of firms that were voluntarily autarkic in 2013 were also voluntarily autarkic in 2019, whereas 52% of voluntarily autarkic firms had become non-autarkic in 2019. The diagonal captures the extent to which a state is persistent. Non-autarky exhibits the highest persistence; and forced autarky the lowest. Moreover, it appears that movements out of financial autarky dominate those into autarky.<sup>14</sup> Since the panel follows the same firms over time, this effect may also reflect the age of firms, whereby young firms tend to be somewhat more autarkic than older firms (see below and Table 2).

**Figure 11**  
The prevalence of financial autarky



Source: Authors' own calculations based on EBRD-EIB-WBG Enterprise Survey

**Figure 12**  
Transition matrix

		2019		
		Voluntary	Forced	Non-Autarkic
2013	Voluntary	35	13	52
	Forced	27	16	57
	Non-Autarkic	15	7	78
	TOTAL	20	9	71

Source: Authors' own calculations based on EBRD-EIB-WBG Enterprise Survey 2013 and 2019

**Small, young firms, less sophisticated firms, those coming from informality and those catering mainly for the local market are more likely to be financially autarkic.** Table 2 shows which firms are more likely to be financially autarkic and voluntarily autarkic. Size and age are strongly associated with financial autarky with SMEs and young firms more likely to be financially autarkic. As expected, firms with audited financial statements are less likely to be autarkic. Firm sophistication, as measured by having an internationally recognised quality certification, a website, using licensed technology and being able to offer formal training to employees, is associated with lower autarky. The same applies to higher

<sup>14</sup> As this is built on panel data the size of the whole sample reduces while gaining the advantage of being able to follow each firm.

scoring ESG firms, particularly for voluntarily autarkic firms. To support these findings, Table 2 shows that innovative firms also tend to be less autarkic, particularly less voluntarily so than firms that are not innovative. Firms that cater mainly to local markets are more likely to be autarkic than exporters. Overall, this confirms the idea that more sophisticated firms tend to be more connected to the financial sector.

**Table 2**  
**Firm characteristics and financial autarky (percentage of firms)**

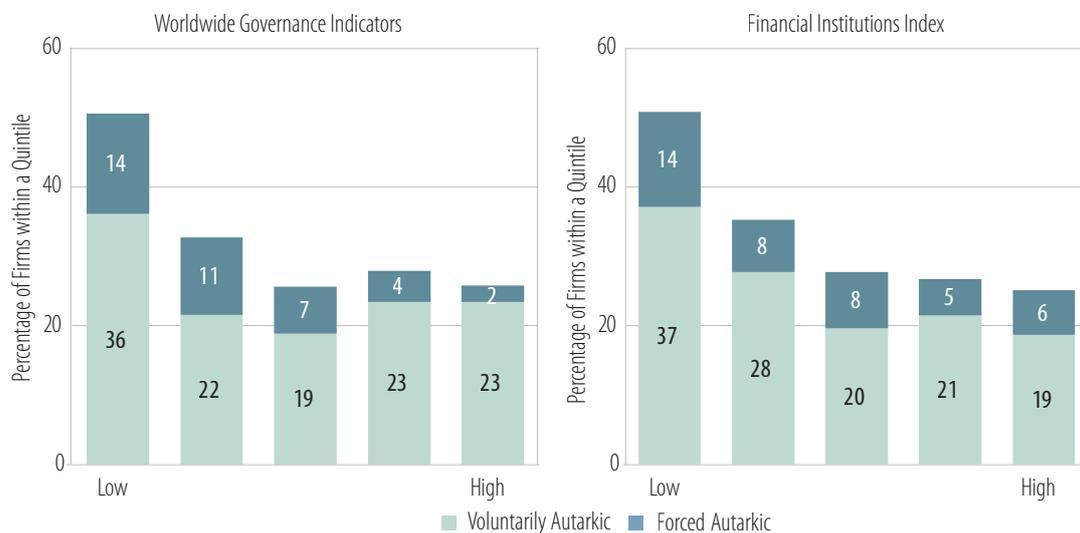
		Autarkic	Voluntarily Autarkic	Forced Autarkic
Size	SME	33	24	8
	Large	17	12	5
Age	<5 Years	40	30	10
	>=5 Years	31	23	8
Innovator	Yes	27	20	7
	No	35	26	8
Website	Yes	26	20	6
	No	41	30	11
Foreign Tech. License	Yes	25	20	5
	No	32	24	8
Informal	Yes	26	19	7
	No	32	24	8
Exporter	Yes	23	18	4
	No	34	25	9
<i>Degree of sophistication and compliance</i>				
ESG	Higher	27	20	7
	Lower	35	26	9
Audited	Yes	26	20	6
	No	35	26	9
Offering Formal Training	Yes	27	21	6
	No	34	25	9
<i>Other</i>				
Foreign Ownership	Yes	37	30	7
	No	32	23	8
Female CEO	Yes	41	31	10
	No	30	22	8
EAST & SE 2019		31	23	8

Note: "Informal" refers to firms that were operating originally in the informal sector when they were created

**Voluntary financial autarky is an endogenous response to a difficult operating environment.**

Figure 13 shows the percentage of financially autarkic firms conditional on quintiles of the financial institutions index. Perhaps unsurprisingly, countries with lower scores in the financial institutions index have a higher share of autarkic firms. But these countries not only have a higher share of forced autarkic firms, they also have a higher share of voluntarily autarkic firms. This also applies to the other plot of Figure 13. It suggests that gaps in the institutional development of credit market lead to some disconnect for firms. In other words, firms organise themselves in a way that enables them to operate without external finance. These results call for reforms to the business environment to facilitate firms' investment opportunities, thus increasing their appetite for external finance.

**Figure 13**  
**Institutional quality and financial development correlates with the level of financial autarky**



Source: Authors' own calculations based on EBRD-EIB-WBG Enterprise Survey

**The COVID-19 follow-up surveys can be used to gain insights into the behaviour of financially autarkic firms during the pandemic.** A final set of econometric exercises explores how financially autarkic firms fare during the COVID-19 crisis (see Annex B, Table B.2). These are based on the COVID-19 follow-up surveys available for a subset of the economies covered by the 2019 Enterprise Survey wave. The analysis pursues two objectives. First, financially autarkic firms constitute a significant share of the enterprise population in most sample economies, and understanding how they cope with the economic fallout of a major pandemic is of interest in its own right. Second, the COVID-19 shock can be exploited to gain insights into the forces that govern the capital structure choices of autarkic firms. On the one hand, all other things being equal, they should be good borrowers given that they entered the pandemic with zero leverage. On the other hand, they may not have an existing relationship with a bank, which in turn exacerbates information asymmetries.

**Voluntarily autarkic firms exhibit a certain degree of resilience during the COVID-19 crisis.** At first glance, this may not seem surprising given that autarkic firms are not exposed to rollover risk. Moreover, autarkic firms are by definition unleveraged. Thus, all other things being equal, they should be attractive borrowers. On the other hand, these firms do not have a pre-existing relationship with a bank, which in times of crisis aggravates problems of adverse selection. The exit rates of autarkic firms are no higher than those of non-autarkic firms: voluntarily autarkic firms are as likely to file for insolvency as any other firm. Voluntarily autarkic firms are less likely to exhibit financial stress as measured by delayed payments to suppliers, property owners or tax authorities. Forced autarkic firms are riskier as they are more likely to experience liquidity or cash flow shortages than non-autarkic firms operating in the same sectors. Subject to declines in cash flow, voluntarily autarkic firms are less likely to tap bank finance and more likely to inject equity, which presumably comes from the existing owners (see Annex B, Table B.2).

**Box 2**

**Liability dollarisation/euroisation on firms' balance sheets**

**Extensive dollarisation or euroisation has been a driver of rapid financial sector growth in the region in recent years.** Easy access to long-term international funding in foreign currency has allowed relatively fast growth of financial penetration, via the enhanced supply of foreign exchange credit. This process is not without risks, as has been demonstrated by phases of boom and bust, and extensive market regulation of foreign exchange credit and risk exposure. This box analyses the phenomenon and the associated sources of risks.

**Historical experiences suggest that currency mismatches are an important source of vulnerability for firms.** Extensive evidence on the inadequacy of financial intermediation and the significant costs caused by it call for further deepening in the financial systems of the region's economies. But rapid credit expansion also brings risks. The experience of Central and Eastern Europe during the first decade of the millennium shows that one of these risks is liability dollarisation. In this period, the entry of foreign banks accelerated financial deepening, but the funding provided by these banks was overwhelmingly in hard currencies and thus exposed the real sector to currency mismatch risk. Realisation of risks brought about a sizeable burden on foreign exchange indebted economic units.

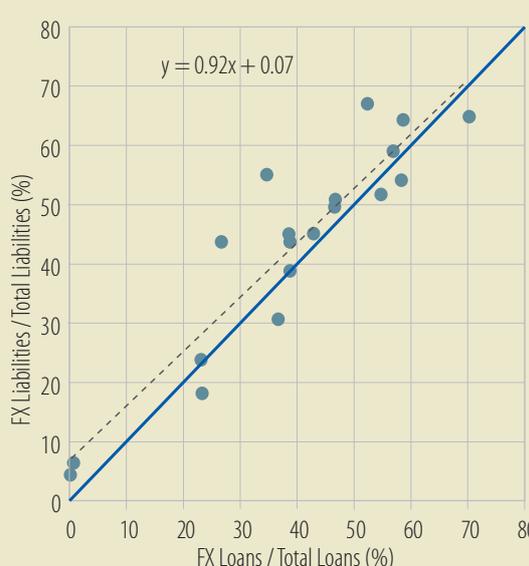
**Liability dollarisation is pervasive among firms in many regions, albeit lower than recorded in 2013.** Foreign exchange loans are more common in the Eastern Neighbourhood, Central Asia and the Western Balkans, where the share of foreign exchange indebted firms on average ranges between 18% and 20%, while it is around half that (8%) in Central and Eastern Europe. The latter region includes four euro area countries where the liability dollarisation ratio (defined as the number of firms with foreign exchange loans as a share of all firms with loans) is practically zero. In Turkey and Russia, the share of firms with a foreign exchange loan is close to zero: 2% and 0.1% respectively. The liability dollarisation ratio varies significantly within regions. For example, it ranges between 0% and 50% in Central and Eastern Europe and the Western Balkans. But foreign exchange indebtedness has declined in all regions compared with 2013 (Figure 2.1).

**Figure 2.1**  
Share of foreign exchange indebted firms in all firms with loans (percentage)



Source: Authors' own calculations based on EBRD-EIB-WBG Enterprise Survey

**Figure 2.2**  
Share of foreign exchange liabilities versus share of foreign exchange loans



Source: IMF, national central banks

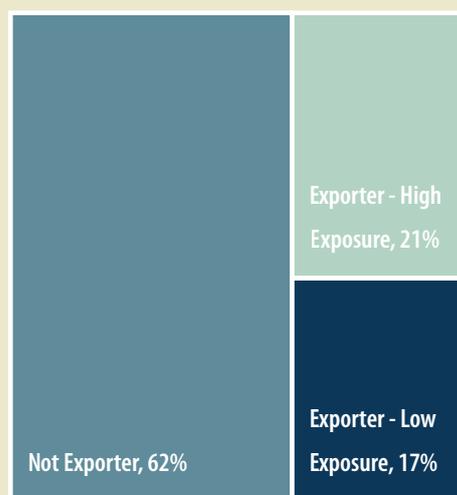
### Liability dollarisation on banks' balance sheets seems to be the main driver of foreign exchange lending.

The empirical literature suggests that difficulties in raising local currency funding are a key driver of banks' foreign exchange lending (see, for example, Rennhack and Nozaki, 2006). In less developed financial systems with limited access to international funding, the main source of hard currency funding is residents' foreign exchange deposits. In relatively advanced systems, foreign borrowing also accounts for a significant share of foreign exchange liabilities. Banks cannot lend hard currency funds in local currency as normally regulatory authorities apply a cap on the maximum amount of (net or gross) open currency positions. In addition, financial derivatives enabling banks to convert foreign exchange funding into local currency funding are largely unavailable. As a result, banks transfer the currency risk to their clients, which is reflected in a high correlation between foreign exchange liabilities and assets (Figure 2.2). On the other hand, for countries where banks get access to external borrowing or financial derivatives, such as Turkey, the relationship between on-balance sheet foreign exchange liabilities and foreign exchange loans weakens significantly.

### Despite prudential efforts towards limiting foreign exchange lending, around two-thirds of the foreign

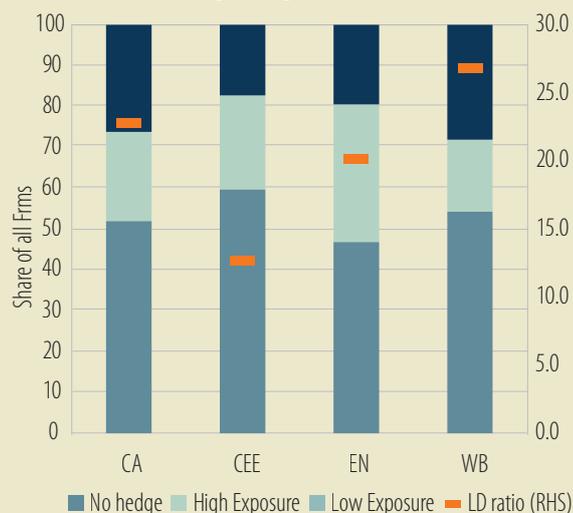
exchange indebted firms are unhedged. Banks' foreign exchange lending practices are paramount for limiting currency mismatch in firms' balance sheets. This can be tested using a pooled OLS regression, where the dependent variable is having a foreign exchange loan and the regressors are firm size, being an exporter and the interaction of the two terms, controlling for other unobservables. The results indicate that banks seem to apply a certain degree of caution in foreign exchange lending. They are more likely to lend in foreign exchange to larger firms and exporters, and while being an exporter does not affect the likelihood of getting a foreign exchange loan for larger firms, it matters for small firms. Nonetheless, in the Eastern Neighbourhood, Central Asia and the Western Balkans, where liability dollarisation is relatively higher, around half of the foreign exchange loans goes to non-exporters, whereas in Central and Eastern Europe, around 60% of foreign exchange indebted firms have no export revenues. The sufficiency of natural hedge is also paramount. This can be examined by comparing foreign exchange loan amounts with export revenues at the firm level. Considering the fact that the average maturity of foreign exchange loans is around three years, firms with a foreign exchange loan amount-to-exports ratio below three are considered sufficiently hedged. Among the exporters with foreign exchange loans, the Eastern Neighbourhood has the highest ratio of firms with insufficiently low hedge (64%), followed by Central and Eastern Europe (57%). In Central Asia and Central and Eastern Europe, more than half of the foreign exchange indebted exporters also have adequately high natural hedge (Figure 2.3 and 2.4).

**Figure 2.3**  
Foreign exchange indebtedness and natural hedge



Source: Authors' own calculations based on EBRD-EIB-WBG Enterprise Survey

**Figure 2.4**  
Foreign exchange indebtedness and natural hedge: regions



Source: Authors' own calculations based on EBRD-EIB-WBG Enterprise Survey

### 4.3. Access to finance, investment and growth

**Low levels of financial deepening and firms' constraints in access to finance, as well as firms' financial autarky, are linked to both demand or supply factors.** While fully disentangling the two is difficult, the analysis establishes that credit availability for firms is associated with investment and growth, thus showing the practical benefits of being supported by and connected to the banking sector. Credit-constrained firms invest less than unconstrained firms. A simulation exercise complements these findings, associating the removal of credit constraints with growth gains, although the effects are muted in some sub-regions. Moreover, even among firms that are investing, access to credit is associated with faster firm growth. The analysis also shows that financial autarky is associated with a lower propensity to invest and lower employment growth. The firms that voluntarily choose to remain disconnected from the financial sector end up losing growth opportunities.

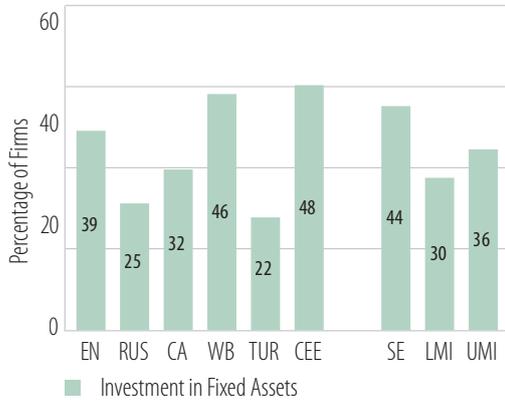
**Firms using external finance for their investments exhibit higher employment growth than firms not tapping external finance.** Figure 14 shows the percentage of firms investing in fixed assets, such as land and buildings or machinery and equipment, during the previous financial year. At 48%, investment rates are highest in Central and Eastern Europe, followed by the Western Balkans (46%) and the Eastern Neighbourhood (39%). In Turkey and Russia, on the other hand, only 22-25% of firms invested, reflecting the cyclical position of their economies.<sup>15</sup> Figure 15 focuses on the firms that invested: it relates employment growth to their liability structure. In particular, Figure 15 compares firms that applied for loans and obtained them to firms that did not apply or had their loan applications rejected.<sup>16</sup> It turns out that firms that obtained loans exhibit substantially higher employment growth in the years preceding the interview. The difference is particularly pronounced in Turkey, where firms that obtained loans grew by on average 7 percentage points compared with 2 percentage points for firms that did not obtain loans. This association could be a result of several forces. First, firms with high growth potential may find it easier to obtain loans. Second, the availability of external finance may enable firms to fund investments that they would otherwise not be able to implement or only on a smaller scale.

**Autarkic firms – those shut off from the financial sector – are smaller, exhibit lower employment growth and invest significantly less.** Figure 11 has shown the prevalence of autarky across the sub-regions. Figure 16 scores this dimension against firms' propensity to invest. A small share of autarkic firms invests in fixed assets, with on average more than two-thirds of autarkic firms not investing. Notably, a very small share of autarkic firms invests in the Eastern Neighbourhood, Russia, Central Asia and Turkey. In Central and Eastern Europe and the Western Balkans, more than 50% of autarkic firms do not invest. Figure 11 has shown that the vast majority of autarkic firms have chosen voluntarily to be autarkic. Figure 17 shows median firm size conditional on age and on whether the firm is voluntarily autarkic or non-autarkic (see Box 1). The median autarkic firm employs fewer people than the median non-autarkic firm. Furthermore, the size differential increases with firm age. This is consistent with non-autarkic firms growing faster than non-autarkic firms. Although Figure 17 refers to employment levels, regression results in Annex B (Table B.2, column 1) provide direct evidence on employment growth. On average, voluntarily autarkic firms have 1.6 percentage points lower employment growth than non-autarkic firms. Firms forced into autarky face an even bigger growth penalty of 2.7 percentage points. The regression results are consistent with the notion that autarky has a cost in terms of forgone growth. On the other hand, it may also be that firms with low growth opportunities chose to be autarkic. As the surveys do not contain information on firms' growth opportunities, it is not possible to distinguish between both interpretations. But at a minimum, the data suggest that firms with growth opportunities use external finance to realise them.

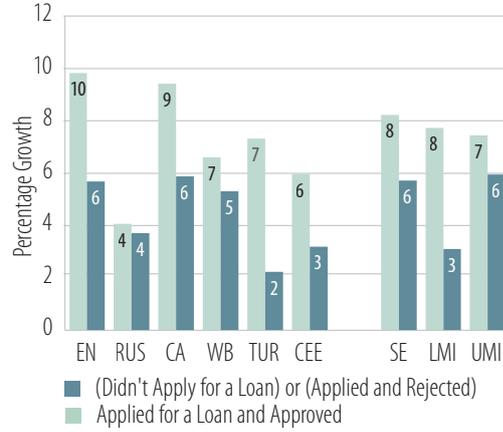
<sup>15</sup> This is consistent with the sharp drop of investment rates compared with the 2013 Enterprise Survey.

<sup>16</sup> At an even more granular level, firms that "do not need a loan" behave similarly to "firms that were discouraged or were rejected". These two elements form the aggregate of firms that did not apply for a loan or had their application rejected.

**Figure 14**  
Propensity to invest in fixed assets



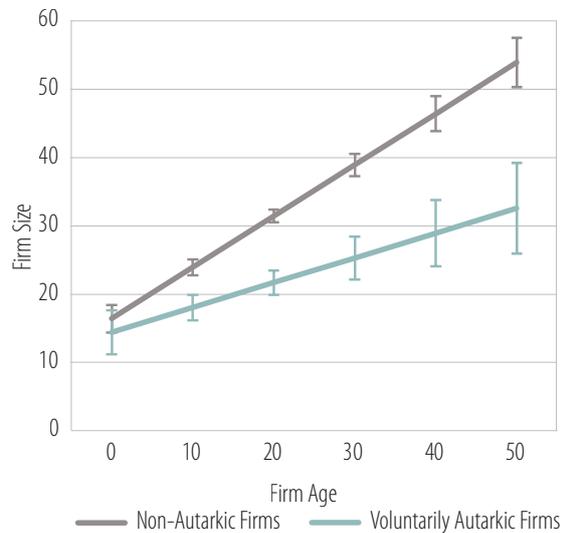
**Figure 15**  
Employment growth among firms that invested and have access to credit



**Figure 16**  
Autarkic firms – share of investing and non-investing firms



**Figure 17**  
Voluntarily autarkic, firm size and age



Source: Authors' own calculations based on EBRD-EIB-WBG Enterprise Survey

Source: Authors' own calculations based on EBRD-EIB-WBG Enterprise Survey

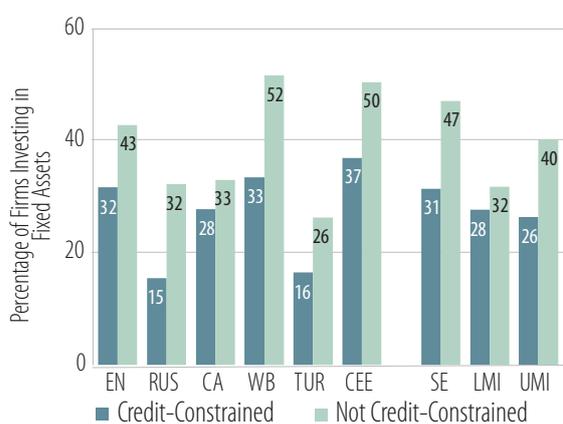
Note: Fitted values from a median regression of firm size as measured by the number of employees on firm age and financial autarky.

**Credit-constrained firms tend to invest less than firms that are not credit-constrained.** Figure 18 documents the association between being credit-constrained and firms' propensity to invest. Across all sub-regions, firms that are not credit-constrained have a significantly higher propensity to invest. Notably, in Central and Eastern Europe and the Western Balkans, around 50% of unconstrained firms invested. Similarly, in the Eastern Neighbourhood, about 40% of unconstrained firms invested. This share is lower in Turkey, Russia and Central Asia, reflecting the lower baseline propensity to invest in these areas, as shown in Figure 14. Nonetheless, constrained firms also invest less even in these jurisdictions. This evidence suggests that removing credit constraints would potentially increase investment at the firm level, thus leading to possible positive effects on output at the macro level.

**Removing credit constraints has a positive impact, but the results vary sizeably across sub-regions and countries.** Estimation of the potential growth gains stemming from enhanced access to credit requires several steps. First, Enterprise Survey data are used to estimate the association between investment and credit constraints. The regression output is then used to calculate the counterfactual investment level, conditional on removing the constraints. In the next step, predicted investment levels are aggregated at the country level to obtain the amount of investments under the counterfactual scenario relative to actual investment. Finally, based on a standard production function approach, the investment volumes under the two scenarios are used to project the capital stock and output.<sup>17</sup> Figure 19 illustrates the level of GDP projected over a ten-year horizon under the counterfactual scenario relative to the baseline (that is, the percentage point difference between the counterfactual scenario and the baseline GDP level). Turkey stands out with a GDP level that is 18 percentage points higher than the baseline; but this is related to the unusually tight financial conditions in 2019.<sup>18</sup> Russia, on the other hand, sees more limited gains from the removal of the constraints. Among sub-regions, Central Asia and the Eastern Neighbourhood get the highest rise in their output (7%), followed by Central and Eastern Europe (3.6%), whereas output levels in the Western Balkans and Southern Europe are only marginally above the baseline scenario (2% and 1%, respectively).<sup>19</sup>

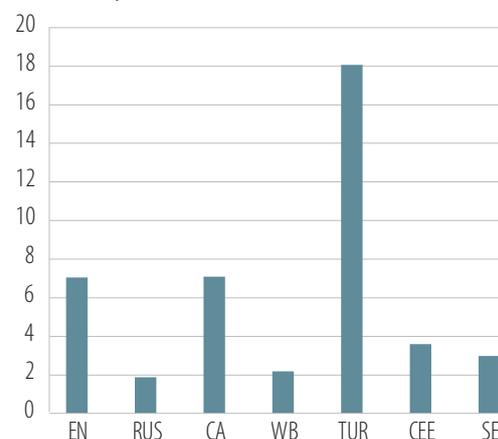
**The prevalence of financial constraints at the firm level is the main driver of the substantial variation in output at country level.** For a given country, the output gain under the counterfactual scenario is determined by two factors: (i) the pervasiveness of constraints at the firm level; and (ii) the marginal effect of an additional investment on growth.<sup>20</sup> The proportion of constrained firms across countries varies substantially, and so is the amount of investment predicted under the counterfactual scenario (see Annex C, Figure C.1).<sup>21</sup> For example, the relatively modest output gains from eliminating constraints in the Western Balkans stem largely from the lower incidence of credit constraints at the firm level.

**Figure 18**  
Investment propensity for credit-constrained and non-credit-constrained firms



Source: Authors' calculations based on EBRD-EIB-WBG Enterprise Survey

**Figure 19**  
Total output gains relative to baseline (cumulative percentage points deviations over ten years)



Source: Authors' calculations based on EBRD-EIB-WBG Enterprise Survey

17 Constrained and unconstrained firms are assumed to have the same production functions; there are no binding constraints other than finance.  
 18 Turkish financial markets saw massive fluctuations during 2019, triggered by several domestic political issues. During this period, loan interest rates went up substantially, which probably increased the number of discouraged firms. Moreover, in a time of crisis, the need for loans increases substantially due among other things to increasing liquidity needs.  
 19 The simulation assumes that the complementary productive factors (for example, labour, public capital) grow in tandem with private capital, which implies that output also grows at the same rate. Given the slack in labour markets of the economies and the fact that public sector is less constrained than private sector, this assumption is not a strong one.  
 20 The marginal effect of investment on growth depends on the initial level of capital stock is used across countries.  
 21 Annex C, Figure C.2 shows the contribution of the micro (credit constraints) and macro (aggregate capital and investment levels) factors together to allow a comparison across sub-regions. The contributions of financial constraints vary to a greater extent.

**Box 3****The effects of extreme weather events on firms' investments and finance\***

**In a warming climate, extreme weather events become more likely and more severe.** In its sixth assessment report, the Intergovernmental Panel on Climate Change (IPCC) considers it an established fact that greenhouse gas emissions have “led to an increased frequency and/or intensity of some weather and climate extremes since pre-industrial times”. The IPCC expects these trends to continue as global average temperatures increase further. The evidence is not limited to extreme heat, but is also reflected in heavy rainfall, floods, storms and droughts. To design appropriate adaptation policies, it is important for policymakers to understand how firms respond to losses from extreme weather, on both the asset and liability sides of their balance sheets.

**A significant share of firms is already suffering losses from extreme weather events.** The Enterprise Surveys do not have data on firms' exposure to extreme weather per se. Instead, they focus on the economic consequences of extreme weather, identifying firms that are experiencing monetary losses linked to such events. But there is no information available on the scale of the damage. About 9% of firms report having experienced monetary losses due to extreme weather, such as storms, floods, droughts and landslides, in the previous three years. Figure 3.1 shows that the share of firms suffering losses from extreme weather ranges from 8.8% in Central Asia to over 10.6% in Southern Europe.

**Firms suffering monetary losses from extreme weather are more likely to invest in physical capital.** Table 3.1 presents regression results on the relationship between losses due to extreme weather and firms' investments. It shows a positive statistically and economically significant relationship between suffering losses due to extreme weather and the probability of increasing capital expenditure. Similarly, these firms have a higher probability of investing in land and buildings and of purchasing new machinery, vehicles or equipment, all other things being equal.

**Firms suffering losses due to extreme weather replenish the stock of capital by building back better.** Table 3.1 shows a positive statistically significant association between suffering losses due to extreme weather and the likelihood that the firm adopted climate-friendly (green) measures. The coefficient is also economically meaningful, as it corresponds to 16.5% of the mean of the dependent variable. Results are also robust to controlling for those aspects that are likely to increase the probability of investing in green measures: having a manager who is directly responsible for climate issues, being subject to energy standards and being subject to levies on energy usage.

**Firms that suffer losses due to extreme weather have a higher need to access external finance, specifically bank credit.** Table 3.2 shows a strong statistically significant and positive relationship between extreme weather losses and the need for bank loans. Firms suffering losses due to extreme weather are on average 12 percentage points more likely to need bank credit.

**To a certain extent, banks accommodate credit demand from firms suffering monetary losses due to extreme weather.** Table 3.2 shows no statistically significant association between extreme weather losses and credit constraints, conditional on needing loans. Banks seem not to constrain access to credit for firms suffering extreme weather losses. But this result is driven by the counterbalancing effects of discouragement and rejections, whereby firms with weather-related losses are less likely to be discouraged and applying for loans and more likely to be rejected (Table 3.2). This result signals that some tightening and/or discrimination is taking place, but also that firms are less creditworthy after a weather shock, given the risk aversion and screening practices of banks.

*\* The results presented in this section are based on a forthcoming working paper: E. Benincasa, F. Betz and L. Gattini: “How do firms cope with losses from extreme weather events?”, Mimeo*

**Figure 3.1****Percentage of firms suffering losses due to extreme weather events by region**

Source: Authors' own calculations based on EBRD-EIB-WBG Enterprise Survey

**Table 3.1****Extreme weather losses and investment**

	(1) Fixed assets	(2) Land and buildings	(3) Machinery and equipment	(4) Green measures
Extreme weather loss	0.06** (0.03)	0.04*** (0.01)	0.05** (0.03)	0.11*** (0.02)
N	18 968	18 968	18 968	18 968
R-squared	0.23	0.17	0.23	0.24
mean(dep. var)	0.421	0.115	0.407	0.663
Sector-size-country FE	Yes	Yes	Yes	Yes

**Table 3.2****Extreme weather losses and access to finance**

	(1) Need a loan	(2) Credit constrained	(3) Discouraged	(4) Rejected
Extreme weather loss	0.12*** (0.02)	-0.05 (0.03)	-0.11** (0.05)	0.07*** (0.02)
N	18 634	8 380	8 380	8 380
R-squared	0.18	0.31	0.29	0.21
mean(dep. var)	0.421	0.464	0.422	0.042
Sector-size-country FE	Yes	Yes	Yes	Yes

Note: Table 3.1 and 3.2 report estimates from sample-weighted linear probability models. The regressor of interest is the dummy variable Extreme weather loss which is equal to one if the firm experienced monetary losses due to extreme weather events; zero otherwise. All columns include firm-level controls (indicators for exporter status, listed firm, sole proprietorship, in partnership, audited financial accounts, female top manager, log of firm age, selling main product in the local market, having a website, and the log of manager's experience) and sector-size-country fixed effects. Column 4 in Table 3.1 on green measures additionally include indicators for payment of an energy levy, for being subject to energy standards and for having a manager responsible for climate issues. Omitted category in firm ownership is Limited partnership and Shareholding company with non-traded shares. Robust standard errors are clustered by Enterprise Survey regions and shown in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## 4.4. Estimating credit gaps: quantifying the extent to which private enterprises are underserved<sup>22</sup>

**In general, a credit gap refers to the difference between the desirable level of credit and the actual level.** This section focuses on estimation prior to COVID-19. Measuring credit gaps is an empirical issue. Broadly speaking, two not mutually exclusive approaches have been deployed in the literature, namely: (i) a macroeconomic approach; and (ii) methodologies centred on firm-level data. The former approach is also defined as the gap between the credit-to-GDP ratio and its long-term trend (Drehmann and Tsatsaronis, 2014). For example, it is employed in macroprudential contexts, including the setting of countercyclical capital buffers (Basel III regulatory framework).<sup>23</sup> Though these methods are useful for identifying the periods of excess credit growth, they are not well suited for assessing structural excess demand for credit in emerging and developing economies. The exercise proposed in this section therefore employs the latter methodology, thus starting from a granular firm perspective.

**A few studies based on firm-level analysis measure credit gaps in emerging and developing countries.** McKinsey & Company (2010) estimates the size of the enterprise-financing gap. A 2013 update (IFC, 2013) reports a gap of around \$2.1-2.6 trillion for developing and emerging markets. In a qualitative assessment of financing gaps, the OECD (2006) concludes that emerging economies have a more pervasive gap than OECD countries. The EIB (2013) measures financing needs for the Eastern Neighbourhood countries based on publicly available data, finding that sizeable gaps persist although financial sectors were doing an adequate job in providing financing to SMEs. The IFC (2017) provides estimates of the financing gap for micro, small and medium-sized enterprises (MSMEs) across developing economies using a potential demand approach: essentially, it models potential demand for credit from MSMEs and matches it with outstanding credit, making use of firm-level information. The study finds that the financing gap for MSMEs totals \$5.2 trillion, or 19% of GDP on average, for a very large pool of emerging and developing economies.

**The credit gap is an estimate of the amount of additional financing required to cover the financing needs of discouraged firms, after correcting for their lower creditworthiness.** The core of the analysis estimates the amount of “acceptable” discouraged firms. These are the firms that form the credit gap. In a nutshell, a “scoring” model estimated on observed and rejected loan applications is applied out of sample to predict the implied rejection rate for the discouraged firms, thus determining the potentially “acceptable” discouraged firms. By doing so, the method screens out firms that would have been rejected had they applied for loans. It adjusts for observable firm-specific differences in the pool of non-applicants vis-à-vis the pool of applicants, while controlling for unobservable factors common to firms operating in a given country or sector. As a last step, the desired/latent loan volume is aggregated across firms, and it is linked to the existing outstanding credit to enterprises in the economy to obtain the credit gap as a percentage of GDP (see Annex D for details on the methodology).

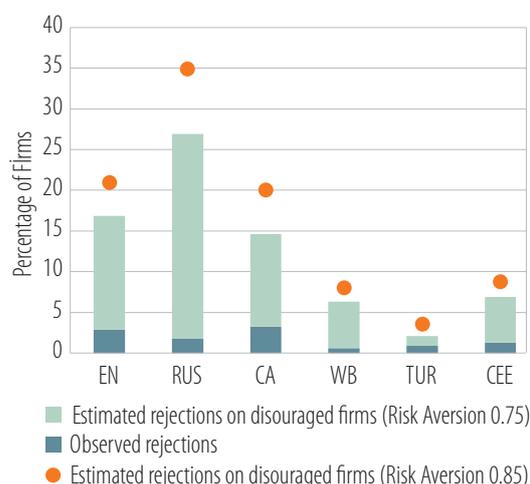
**The approach is subject to several caveats.** In particular, the approach does not correct for unobservable differences between applicants and non-applicants. Such differences may include the quality of the marginal investment opportunity as well as actual profitability/returns of investment. But these caveats largely apply to all firm-based studies of credit gaps. Moreover, this concern can be partially addressed by a model parameter that governs banks’ risk aversion (see Equation 2 in Annex D). But the calculated net credit gaps should be seen more as a ceiling (upper bound) rather than a floor to the potential financing needs.

<sup>22</sup> This section is based on a forthcoming EIB working paper: O. Akbas, F. Betz and L. Gattini, “An approach to measure credit gaps in emerging and developing economies based on survey data”, Mimeo.

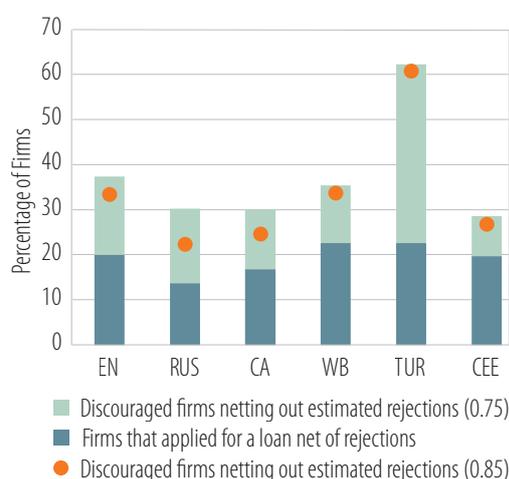
<sup>23</sup> It is based on various methods including, one-sided Hodrick-Prescott (HP) or other filtering methods – for example, bandpass methods Baxter and King (1999) and Christiano and Fitzgerald (2003); Kalman filter (Durbin and Koopman, 2012) – as well as structural approaches such as vector error correction modelling (Galán and Mencia (2018); Lang and Welz (2018); IMF (2015) or a mixture of the two (IMF, 2020) and Abiad et al (2011)

**Implied rejection rates for discouraged firms are higher than observed rejection rates.** Figure 20 shows the average observed rejection rates. These range between 1% and 3% of the population of firms for the average country in each sub-region. The imputed rejection rates for discouraged firms are much higher and, except for Turkey, are a multiple of the observed rejection rates. This is based on two assumptions. First, banks are assumed to employ the same screening criteria across all firms – that is, those applying and those not applying for loans. Second, the risk aversion of the banking sectors is calibrated to reproduce the actual rejection rates.<sup>24</sup> Ultimately, the implied average quality of the discouraged firms is lower than those firms that actually applied for loans. As a result, a significant share of firms is screened out because of their lower creditworthiness. To account for unobservable differences between applicants and non-applicants, a higher risk aversion parameter has been applied, yielding a theoretical in-sample rejection rate twice the average observed rejection rate. The dot in Figure 20 represents the implied rejection rates.

**Figure 20**  
Observed rejections and estimated rejections on discouraged firms (making use of alternative risk aversion parameters)



**Figure 21**  
Firms that received loans and “acceptable” discouraged firms, netting out estimated rejections from Figure 20



Source: Authors’ calculations based on EBRD-EIB-WBG Enterprise Survey

Source: Authors’ calculations based on EBRD-EIB-WBG Enterprise Survey

**The credit gap is estimated to account for 17-20% of regional GDP or \$822-1 032 billion (out of which \$587-742 billion is from Russia and Turkey combined) prior to the COVID-19 crisis.** To obtain an estimate of the credit gap, the respective rejection rates are subtracted from the shares of applying and discouraged firms. Figure 21 shows their relative importance among the population of firms for the average country within each sub-region. In Figure 21, the share of discouraged firms after the imputed rejection is smaller than the share of firms that applied for loans (also net of rejections), except for Turkey where the implied rejection rates on discouraged firms are low. Ultimately, these two components are linked to the outstanding amount of credit to non-financial corporations, to obtain the credit gap.<sup>25</sup> Figure 22 shows the credit gap bands for each sub-region as a percentage of GDP. It also reports a gross credit gap that does not apply any adjustment to assess the quality of discouraged firms. By construction, this gap is much higher and it is reported for information only.

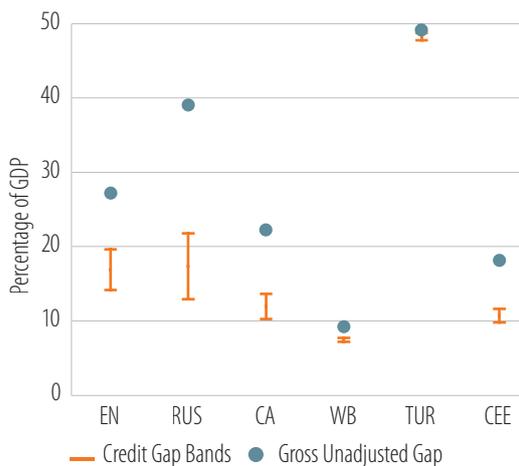
**These findings can be broken down further to obtain credit gap measures for SMEs and corporates** (Figure 23). The SMEs credit gap for Eastern Europe and Central Asia is estimated at 11.5-15% of regional GDP or \$551-718 billion (out of which \$400-531 billion is from Russia and Turkey combined). For comparison,

24 This is obtained via a parametrisation process employing a loss function for the banking sectors described in Annex B.

25 Non-financial corporations’ credit is sourced from IMF FSI, IMF FAS and national central banks.

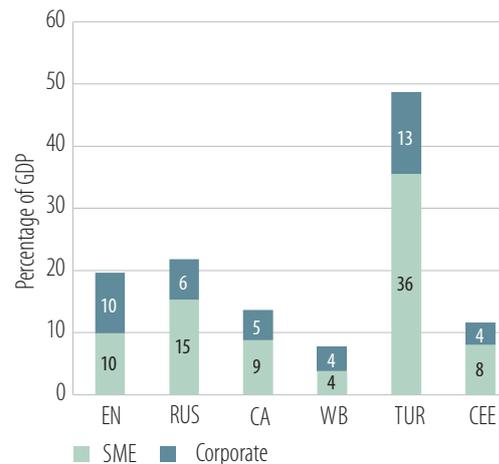
the IFC (2017) credit gap measures actualised with 2019 prices implies a regional credit gap for SMEs equal to 20% of GDP, thus somewhat higher than the estimated band in this analysis. Finally yet importantly, the corporate credit gap is significantly smaller than the gap for SMEs. It is estimated at 5.7-6.6% of regional GDP or \$271-314 billion (out of which \$187-211 billion is from Russia and Turkey combined).

**Figure 22**  
Credit gaps bands as percentage of GDP



Source: Authors' calculations  
Note: These figures represent the total credit gap in a given sub-region (as % of GDP) and not the credit gap for the average country within each sub-region

**Figure 23**  
Credit gaps as percentage of GDP – breakdown by firm type (employing the upper bound risk aversion parameter)

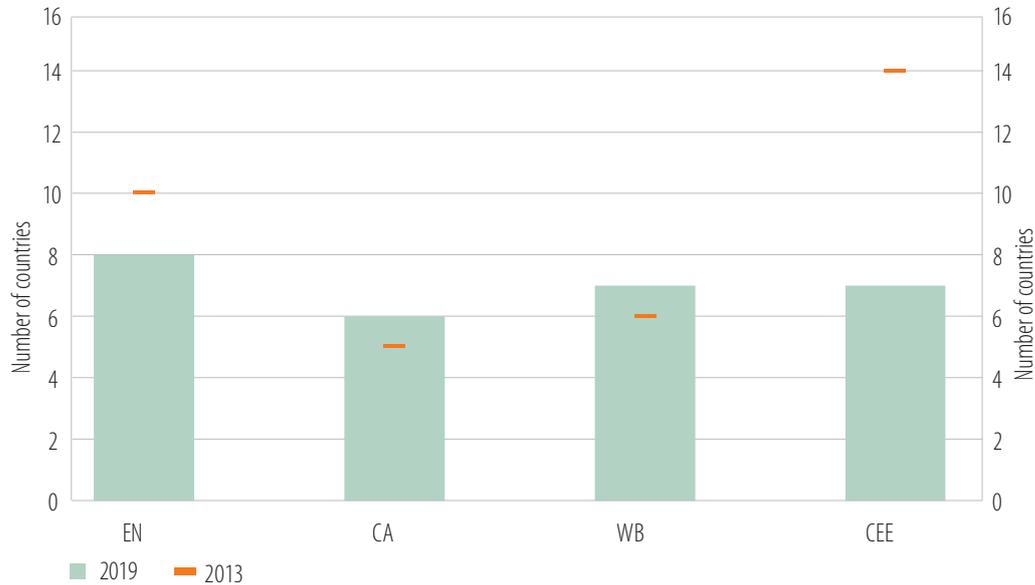


Source: Authors' calculations

**Collateral-related reforms can be an important element in reducing credit gaps.** Section 4.2.1 has documented still elevated collateral levels for the whole region. Campello and Larrain (2016) demonstrate the improved access to finance for a broad cross-section of Romanian firms in the aftermath of the collateral reform in Romania. Love et al (2013) show that collateral registries for movable assets increases firms' access to bank finance. Specifically, collateral reforms could include expanding the scope of the law governing collateral or/and reforming credit registries. Countries in the Eastern Neighbourhood introduced collateral-related reforms in the five-year period through to the 2019 wave of the Enterprise Survey, followed by Central and Eastern Europe and the Western Balkans, with the number of countries that introduced collateral related reforms in the Western Balkans and Central Asia higher in the 2019 survey relative to that of the previous wave (Figure 24). When splitting by type of collateral reforms, the number of countries that introduced law-related reforms over the five years to the 2019 survey was higher relative to the 2013 survey across the board (except in Central and Eastern Europe). Fewer countries phased in registry-related reforms in the five years to the 2019 survey relative to the 2013 survey, implying that countries mostly introduced law rather than registry-related reforms in the five years to the 2019 survey.<sup>26</sup>

<sup>26</sup> One caveat to be added is the credit measures implemented during banking crises, like the global financial crisis. The central bank, as lender of last resort, could provide emergency access to finance when firms face sudden financial market disruptions.

**Figure 24**  
**Collateral reforms by sub-region**



Source: WB Doing Business Law Library 2013 and 2019

**The introduction of collateral-related reforms has a positive impact on firms' broad access to finance.** The subsequent analysis is based on a differences-in-differences estimation of the impact of collateral reforms to access to finance, and contributes to the existing literature through enlarging the scope of the reforms examined, thus including reforms to enhance the scope of collateral on top of the development of credit registries. The analysis focuses on the impact of reforms initiated in 2014-18.<sup>27</sup> Specifically, the countries that introduced reforms aimed at expanding the scope of the law governing collateral or/and reforming credit registries between 2014 and 2018 are defined as the reform-treated countries, while the others are the control group. Table 3 shows the key results, with the interaction of treated and period being the differences-in-differences estimator capturing the impact of the reform. The introduction of collateral-related reforms has a statistically significant and positive impact on firms' broad access to finance (that is, access to loans, lines of credit or overdrafts). It also increases the number of firms that invest in fixed assets and with perceived access to finance to be minor or no obstacle, while the share of collateralised loans in total loans increases.

<sup>27</sup> Specifically, the collateral registry is one of the items in the Ease of Doing Business "Getting Credit" index, which includes seven additional components pertaining to movable collateral laws and two components pertaining to bankruptcy laws. Some of the collateral reforms other than the introduction of a registry include: allowing out-of-court enforcement of collateral and introducing a law that allows a business to grant a non-possessory security right in a single category of movable assets (such as accounts receivable or inventory), without requiring a specific description of the collateral. The Doing Business law library is used, which is the largest free online collection of business laws and regulations for local firms in 185 countries since 2004.

**Table 3**  
**Empirical results**

	(1)	(2)	(3)	(4)
	Access to finance	Proportion of firms requiring collateral	No financial obstacle	Invested in fixed assets
Firm size	0.0800*** (0.00415)	3.680*** (0.618)	0.00346 (0.00356)	0.109*** (0.00422)
Firm age	0.0166** (0.00710)	3.026*** (1.119)	0.00203 (0.00579)	-0.0538*** (0.00718)
Foreign owned firm	-0.125*** (0.0196)	-1.541 (3.965)	0.0431*** (0.0145)	-0.0227 (0.0204)
Government owned firm	-0.00621 (0.0331)	0.310 (6.183)	-0.0127 (0.0307)	-0.0592 (0.0385)
Firm is exporter	0.000556*** (0.000131)	0.0106 (0.0196)	-0.000244** (0.000113)	0.000833*** (0.000139)
Treated x Period	0.0549*** (0.0189)	8.714*** (3.002)	0.0307** (0.0154)	0.0418** (0.0193)
Observations	36,170	13,143	36,170	35,872
R-squared	0.187	0.127	0.077	0.132
Country FE	YES	YES	YES	YES
Sector FE	YES	YES	YES	YES

*Note:* Standard errors in parentheses \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$  Coefficient estimates from OLS regression using survey weighted observations (Stata's *svy* prefix) with country and sector fixed effects. Standard errors are reported in parentheses below the coefficient. The dependent variable at each column corresponds to Access to finance (1 if access to a loan, line of credit or overdraft, 0 otherwise); autarkic (forced and voluntary autarkic, defined in Box.1); No financial obstacle (1 if no, minor or moderate obstacle to access to finance, 0 otherwise); Invested in fixed assets (1 if 1 firm purchased any new or used fixed asset, 0 otherwise) and Proportion of loans requiring collateral. Independent variables included Treated (1 if firm is in a country that introduced collateral-related reforms over 2014-2018, 0 otherwise); Period (1 if year  $\geq$  2014, 0 otherwise); Firm age (logarithm of Age (years)); Firm size (logarithm of number of workers); Firm is exporter (1 if proportion of sales exported directly in excess of 10%, 0 otherwise); Foreign owned firm (1 if proportion of private foreign ownership in the firm is greater than 50%, 0 otherwise); Government owned firm (1 if government/state ownership is greater than 50%, 0 otherwise). \*\*\*, \*\* and \* denote statistical significance at the 1, 5 and 10 percent levels, respectively.

**The role of central banks should be acknowledged, including the collateral frameworks in place for interbank lending and prudential policy.** Stronger incentives for corporate lending to SMEs could be created through central banks' collateral frameworks and prudential policy. For example, the inclusion of "credit claims" in the Eurosystem collateral framework, and the "additional credit claims" in crisis times (for example, SME loans of lower credit quality), as well as the "SME supporting factor" in capital regulatory requirements in the European Union, have been instrumental in promoting SME lending in Europe. Central banks' collateral policy could also be considered for countries in Eastern Europe and Central Asia. Specifically, banks that participate in credit guarantee schemes could receive from their prudential regulator capital relief in the form of lower risk weights assigned to exposures covered by guarantees meeting specific criteria. Nevertheless, the capital relief for banks that participate in credit guarantee schemes would be limited given the small share of credit guarantee schemes in overall corporate lending (for example, under 10% for countries in Central and Eastern Europe).<sup>28</sup> For the same reason, the prudential regulation covering guarantee schemes is non-existent in some jurisdictions in Eastern Europe and Central Asia.

28 Vienna Initiative (2014), "Credit Guarantee Schemes for SME lending in Central, Eastern and South-Eastern Europe", November.

## 4.5. Conclusions and policy implications

**This chapter highlights that financial deepening and increased access to finance are associated with a higher propensity to invest and faster firm growth.** But throughout the region, there is a gap in terms of firms' access to finance, particularly for SMEs and young firms.

**A sizeable share of SMEs, notably young and innovative SMEs, are credit-constrained.** Size and age are strongly associated with access to finance, with 23% of SMEs being credit-constrained and 37% of SMEs having loans outstanding, compared with 12% and 55% of large firms. Similarly, 23% of firms under five years old are credit-constrained, compared with 20% of firms above age five, while 29% of firms below age five have loans outstanding compared with 39% above age five.

**Financial constraints are associated with decreased growth opportunities for firms.** Innovative large firms are significantly less constrained than innovative SMEs, with the latter showing 6 percentage points higher levels of constraints. Moreover, young innovative SMEs are five times more constrained than young innovative large firms.

**The region has a high share of firms in financial autarky, particularly among SMEs (33%) and young firms (39%).** Autarkic firms finance all their activities and investments entirely from internal sources and have no outstanding liability relationships with the banking sector. The vast majority of autarkic firms in the sample are voluntarily autarkic: they have chosen to disconnect from banks and, by doing so, they lose growth opportunities. Firms that are larger, older, more sophisticated, more export-oriented and with higher ESG standards are less likely to be financially autarkic.

**Additional credit worth 17-20% of GDP would be needed to meet the financing needs of enterprises in the region, mostly SMEs and young firms.** The credit gap estimates the amount of additional financing required to cover the financing needs of discouraged firms, screening out firms that would have been rejected had they applied for loans. It is estimated to be 17-20% of regional GDP or \$822-1 032 billion (of which \$587-742 billion is Russia and Turkey combined), with about two-thirds of the figure coming from SMEs.

**The gaps in terms of financial penetration and access to finance are mostly associated with a mismatch of demand and supply of credit.** This requires efforts in terms of development of the credit market infrastructure. Empirical analysis shows that improvements in collateral frameworks can help to tackle inefficiencies in the allocation of credit, reduce risks and increase the accessibility of credit and help to close credit gaps.

**Enhanced financial literacy as well as raising of audit and accounting standards, in conjunction with a genuine reform agenda geared to improving institutional quality, can decrease information asymmetries and increase firms' capacity, appetite and confidence in engaging with the banking sector, thus helping to reduce the phenomenon of autarky.** Such reforms could also help to smooth the burden of complex procedures and weaken firms' belief that their loan applications will not be approved, thus helping to decrease credit gaps and compress the number of credit-constrained firms. Furthermore, the deployment of guarantee schemes can boost the risk-taking appetite of the banking sector, while their effectiveness can be enhanced via improvements in risk assessment and screening capabilities.

## 4.6. References

- Abiad, A. G., Dell’Ariccia, G. and Li, B. G. (2011). “Creditless Recoveries.” Available at SSRN: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1787352](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1787352)
- Baba, C., Dell’Erba, S., Detragiache, E., Harrison, O., Mineshima, A., Musayev, A., Shamoradi, A. (2020). “How Should Credit Gaps Be Measured?” IMF Working Paper No. 20/6.
- Baxter, M. and King, R. J. (1999). “Measuring Business Cycles: Approximate Band-Pass Filters for Economic Time Series.” *Review of Economics and Statistics*, Vol. 81(4), pp. 575-593.
- Betz, F., Oprica, S., Peltonen, T. A., Sarlin, P. (2014). “Predicting Distress in European Banks.” *Journal of Banking and Finance*, Vol. 45, pp. 225-241.
- Bokros, L. (2001). “Banking Sector Reform in Central and Eastern Europe.” IMF. Retrieved at <https://www.elibrary.imf.org/view/books/072/00033-9781589060135-en/ch08.xml>
- Campello, M. and Larrain, M. (2016). “Enlarging the Contracting Space: Collateral Menus, Access to Credit, and Economic Activity.” *Review of Financial Studies*, Vol. 29(2), pp. 349-383.
- Casey, E. and O’Toole, C. M. (2014). “Bank lending constraints, trade credit and alternative financing during the financial crisis: Evidence from European SMEs.” *Journal of Corporate Finance*, Vol. 27, pp. 173-193.
- Cavallo, Eduardo, Sebastian Galiani, Ilan Noy, and Juan Pantano (2013). “Catastrophic natural disasters and economic growth.” *Review of Economics and Statistics* 95, no. 1461-1549.
- Christiano, L. J. and Fitzgerald, T. J. (2003). “The Band Pass Filter.” *International Economic Review*, Vol. 44(2), pp. 435-465.
- Demirgüç-Kunt, Asli and Ross Levine (2008). *Finance and Economic Opportunity*. Washington, DC: World Bank.
- Drehmann, M. and Tsatsaronis, K. (2014). “The credit-to-GDP gap and countercyclical capital buffers: questions and answers.” *BIS Quarterly Review*. March 2014.
- Durbin, J. and Koopman, S.J. (2012). “Time Series Analysis by State Space Methods.” Oxford: Oxford University Press.
- ECB (2021). “Survey on the access to finance of enterprises. Methodological information on the survey and user guide for the anonymised micro dataset.”
- EIB (2013). “Private Sector Financing and the Role of Risk-bearing Instruments.” Luxembourg.
- EIB (2016). “Neighbouring SME financing. Synthesis Report.” Retrieved at [https://www.eib.org/attachments/efs/economic\\_synthesis\\_report\\_neighbourhood\\_sme\\_financing\\_en.pdf](https://www.eib.org/attachments/efs/economic_synthesis_report_neighbourhood_sme_financing_en.pdf)
- EIB (2018). “Access to Finance in the EU Neighbourhood and Enlargement Countries.” Retrieved at [https://www.eib.org/attachments/country/access\\_to\\_finance\\_in\\_the\\_eu\\_neighbourhood\\_and\\_enlargement\\_countries\\_en.pdf](https://www.eib.org/attachments/country/access_to_finance_in_the_eu_neighbourhood_and_enlargement_countries_en.pdf)
- EIB (2019). “Ten years of the Vienna Initiative. 2009-2019.”
- EIB (2021). “EIB Investment Report 2020/2021: Building a smart and green Europe in the COVID-19 era.” January 2021.
- European Bank for Reconstruction and Development, European Investment Bank, and World Bank Group (2016). “What’s Holding Back the Private Sector in MENA? Lessons from the Enterprise Survey”
- Ferrando, A. and Mulier, K. (2015). “The real effects of credit constraints: evidence from discouraged borrowers in the euro area.” *Working Paper Series* 1842, European Central Bank.

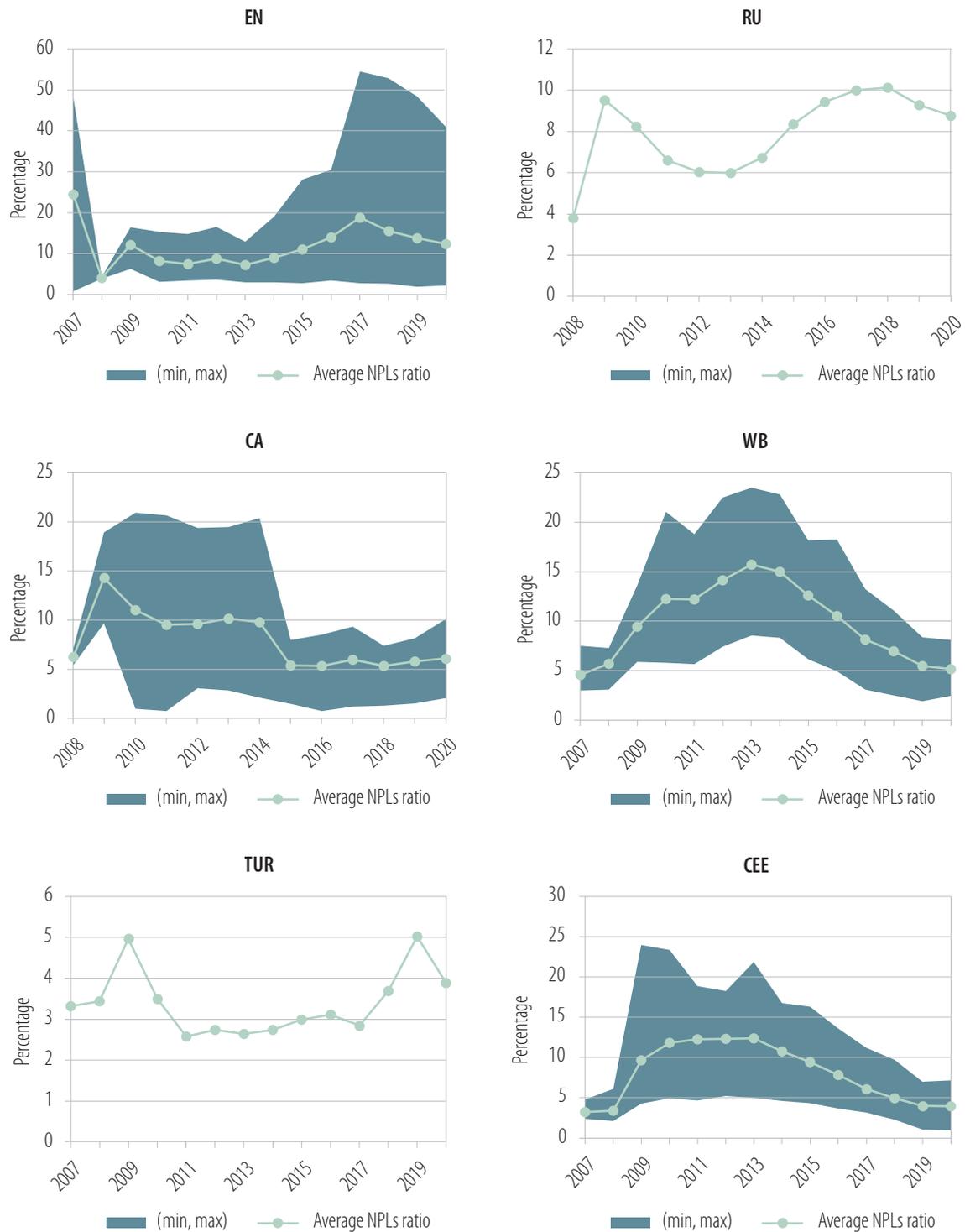
- Galan, J. and Mencia, J. (2018). "Empirical Assessment of Alternative Structural Methods for Identifying Cyclical Systemic Risk in Europe." Banco de Espana Working Paper No. 1825.
- Garcia-Posada Gómez, M. (2019). "Credit constraints, firm investment and employment: Evidence from survey data." *Journal of Banking and Finance*, Vol. 99, pp. 121-141.
- Gorodnichenko, Y. and Schnitzer, M. (2013). "Financial Constraints and Innovation: Why Poor Countries Don't Catch Up." *Journal of the European Economic Association*, Vol. 11(5), pp. 1115-1152.
- IFC (2013). "Closing the Credit Gap for Formal and Informal Micro, Small, and Medium Enterprises." Retrieved at <https://documents1.worldbank.org/curated/en/804871468140039172/pdf/949110WPOBox-380p0Report0FinalLatest.pdf>
- IFC (2017). "MSME Financing Gap. Assessment of the Shortfalls and Opportunities in Financing Micro, Small and Medium Enterprises in Emerging Markets." Retrieved at <https://www.ifc.org/wps/wcm/connect/03522e90-a13d-4a02-87cd-9ee9a297b311/121264-WP-PUBLIC-MSMEReportFINAL.pdf?MOD=AJPERES&CVID=m5SwAQA>
- IMF (2015). "Central Eastern, and Southeastern Europe. Mind the Credit Gap." *Regional Economic Issues*. May 2015.
- IMF (2019). "Financial Inclusion of Small and Medium-Sized Enterprises in the Middle East and Central Asia." Departmental Paper No.19/02.
- Kuntchev, V., Ramalho, R., Rodriguez-Meza, J. and Yang, J. S. (2013). "What have we learned from the Enterprise Surveys Regarding Access to Credit by SMEs?" Policy Research Paper No. 6670, World Bank.
- Lang, H. J. and Welz, P. (2018). "Semi-structural credit gap estimation." ECB Working Paper Series No. 2194.
- Love, I., Martinez Peria, M. S., Singh, S. (2013). "Collateral Registries for Movable Assets: Does Their Introduction Spur Firms' Access to Bank Finance?" World Bank Policy Research Paper No. 6477.
- OECD (2006). "The SME Financing Gap: Theory and Evidence." *Financial Market Trends*, Vol. 2006(2), pp. 89-97.
- OECD (2017). "Enterprise Performance and SME policies in the Eastern Partner countries and peer regions." Retrieved at <https://www.oecd.org/eurasia/competitiveness-programme/eastern-partners/Enterprise-Performance-and-SME-Policies-in-Eastern-Partner-Countries-and-Peer-Regions.pdf>
- McKinsey & Company (2010). "Two trillion and counting. Assessing the credit gap for micro, small, and medium-sized enterprises in the developing world." Retrieved at <https://www.mspartners.org/download/TwoTrillion.pdf>
- Popov, A. and Udell, G. F. (2010). "Cross-border banking and the international transmission of financial distress during the crisis of 2007-2008." *Working Paper Series* 1203, European Central Bank.
- Schaller, H. (1993). "Asymmetric Information, Liquidity Constraints and Canadian Investment." *Canadian Journal of Economics*, Vol. 26(3), pp. 552-574.
- Shao, J. (1997). "An Asymptotic Theory For Linear Model Selection." *Statistica Sinica*, Vol. 7, pp. 221-264.
- Strebulaev, I. A. and Yang, B. (2013). "The mystery of zero-leverage firms." *Journal of Financial Economics*, Vol. 109(1), pp. 1.23.
- Svirydzenka, K. (2016). "Introducing a new Broad-based Index of Financial Development." IMF Working Paper No. 16/5. Retrieved at <https://www.imf.org/external/pubs/ft/wp/2016/wp1605.pdf>
- Vienna Initiative (2014), "Credit Guarantee Schemes for SME lending in Central, Eastern and South-Eastern Europe", November.

## 4.7. Annex

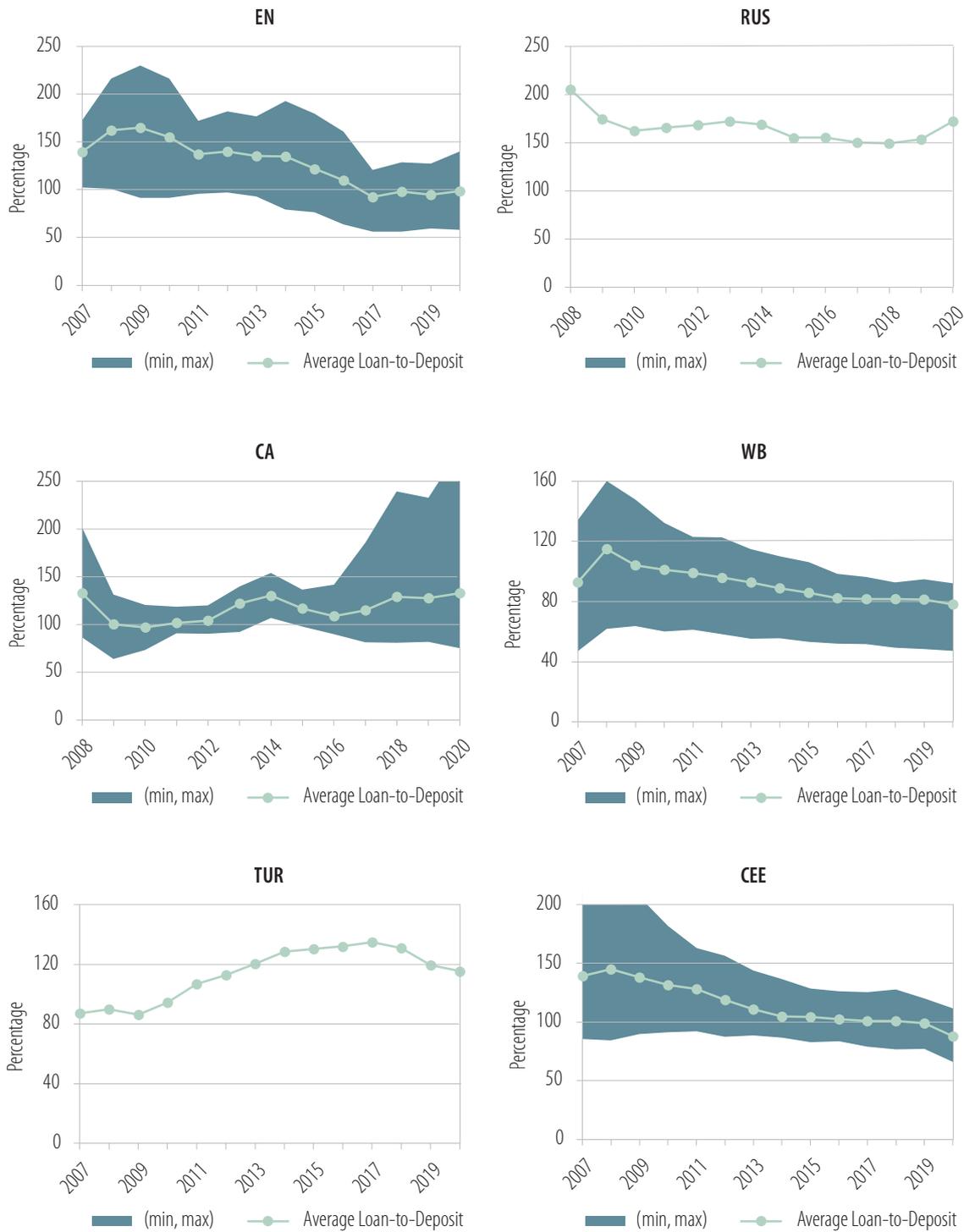
### Annex A

Figure A.1

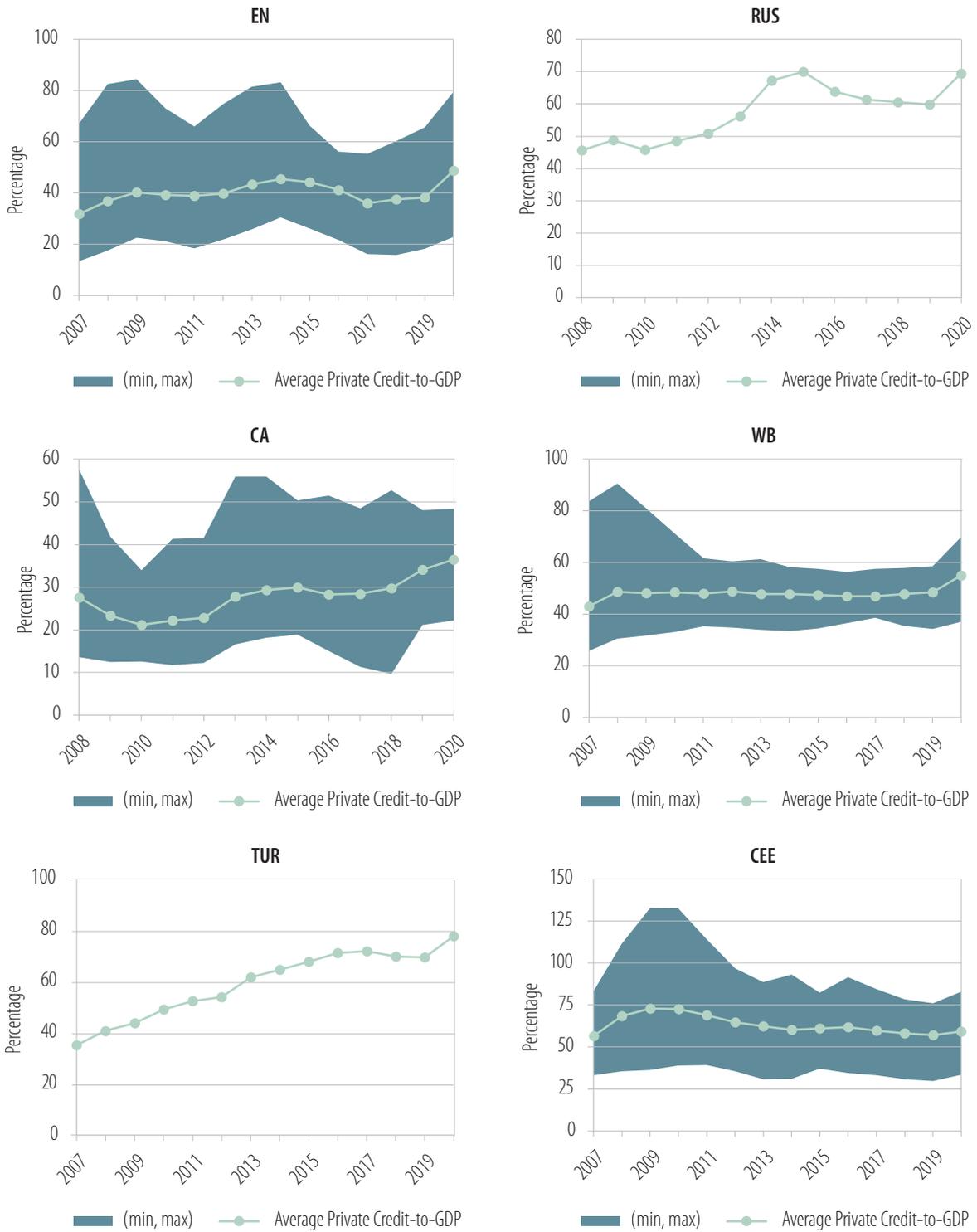
Banking asset quality – average and min-max levels of non-performing loan ratios for each sub-region



**Figure A.2**  
**Banking funding – average and min-max levels of loan-to-deposit ratios for each sub-region**



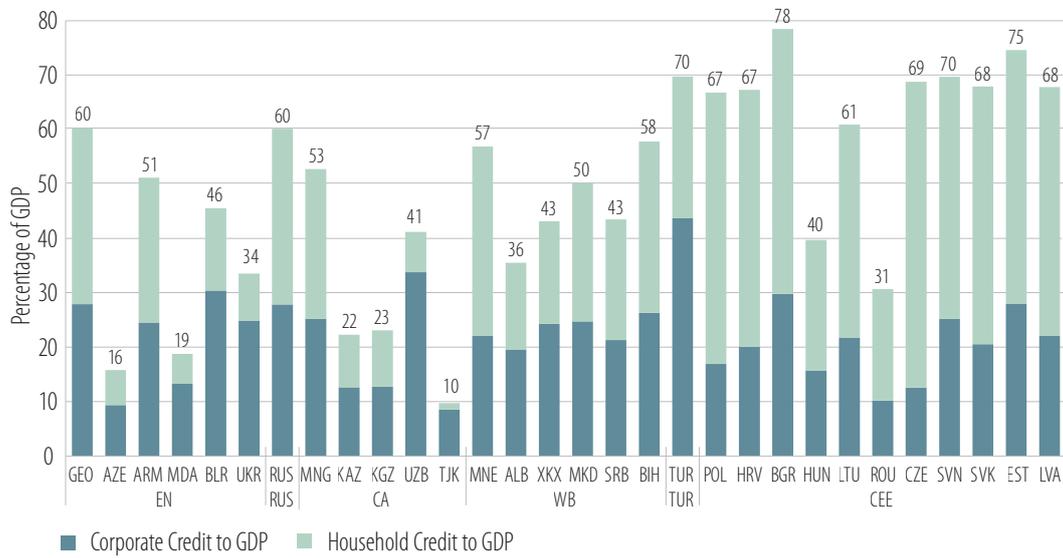
**Figure A.3**  
**Banking penetration – average and min-max levels of credit-to-GDP ratios for each sub-region**



**Figure A.4**  
**Banking system characteristics by country**

	Bank Non-Performing Loans to Total Loans (%)	Bank Regulatory Capital to Risk-Weighted Assets (%)	Bank Return on Assets (%)	Bank Return on Equity (%)	Strength of Legal Rights Index (0-12, best)	Depth of Credit Information Index (0-8, best)	Credit Registry Coverage (% of adults)	Credit Bureau Coverage (% of adults)	Financial Institutions Index (0-1, best)	Financial Markets Index (0-1, best)
Armenia	5.5	17.6	1.5	10.3	6	8	0	82	0.47	0.03
Azerbaijan	#N/A	#N/A	#N/A	#N/A	12	8	0	45	0.33	0.07
Belarus	4.6	17.8	1.9	12.8	3	7	53	0	0.32	0.01
Georgia	1.9	19.5	2.4	19.9	9	8	0	100	0.55	0.03
Moldova	8.5	25.3	2.6	14.6	8	6	0	18	0.42	0.00
Ukraine	48.4	19.7	4.7	37.5	8	7	2	57	0.37	0.04
Russian Federation	9.3	12.3	2.4	19.5	9	7	0	100	0.60	0.36
Kazakhstan	8.1	24.2	3.7	29.5	8	8	0	65	0.40	0.27
Kyrgyz Republic	7.7	23.8	1.4	7.8	9	8	0	39	0.23	0.01
Mongolia	#N/A	#N/A	#N/A	#N/A	9	7	54	0	0.64	0.15
Tajikistan	#N/A	#N/A	#N/A	#N/A	11	7	0	48	0.18	0.00
Uzbekistan	1.5	23.5	2.2	16.7	6	7	0	48	0.37	0.05
Albania	8.4	18.3	1.5	13.3	8	6	56	0	0.37	0.01
Bosnia and Herzegovina	7.4	18.0	1.4	10.4	7	6	47	14	0.53	0.00
Kosovo	1.9	15.9	2.1	17.2	11	6	41	0	#N/A	#N/A
North Macedonia	4.6	16.3	1.3	11.7	9	7	42	100	#N/A	#N/A
Montenegro	5.1	17.7	1.3	10.0	12	5	41	0	#N/A	#N/A
Serbia	#N/A	#N/A	#N/A	#N/A	6	7	0	100	0.44	0.04
Turkey	5.0	18.4	1.4	12.8	7	8	80	0	0.48	0.55
Bulgaria	6.6	20.2	1.5	11.3	8	5	78	0	0.68	0.06
Croatia	7.0	23.2	1.6	11.3	5	5	0	6	0.69	0.27
Czech Republic	2.7	19.7	1.2	18.2	7	7	7	81	0.55	0.38
Estonia	0.4	25.4	1.2	8.0	7	7	0	23	0.47	0.08
Hungary	1.5	18.0	2.0	19.5	9	6	0	91	0.45	0.36
Latvia	5.0	21.7	0.5	5.4	9	8	97	48	0.44	0.07
Lithuania	1.0	19.9	1.4	17.3	6	8	54	100	0.41	0.04
Poland	3.8	18.6	0.7	7.8	7	8	0	100	0.59	0.32
Romania	4.1	22.0	1.3	12.2	9	7	19	55	0.50	0.10
Slovak Republic	2.9	18.2	1.0	9.5	7	7	2	85	0.57	0.04
Slovenia	3.4	18.5	1.5	12.0	3	6	100	0	0.63	0.10

**Figure A.5**  
**Breakdown of credit into corporate and household credit, 2019**



## Annex B

**Table B.1**  
Firms' characterisation by typology of financing situation

	Need (1)	Rejected   Need (2)	Discouraged   Need (3)	Credit-Constrained   Need (4)	Credit-Constrained (5)
Female CEO	-1.97 (1.70)	0.38 (1.52)	-1.75 (2.82)	-1.54 (2.71)	-1.70 (1.46)
CEO Experience (Year)	0.03 (0.07)	-0.03 (0.07)	0.10 (0.11)	0.07 (0.10)	0.06 (0.06)
Foreign Ownership	-10.37*** (2.81)	-1.30 (1.90)	8.88* (4.74)	7.71* (4.25)	-0.36 (2.05)
Certificate	3.09 (1.95)	-0.73 (0.87)	-0.97 (2.62)	-1.53 (2.70)	1.83 (1.66)
Website	-0.17 (1.59)	-1.05 (1.06)	-3.09 (2.48)	-4.16* (2.48)	-1.91 (1.41)
Offering Formal Training	1.88 (1.55)	1.96 (1.42)	-4.83* (2.59)	-2.99 (2.51)	-0.18 (1.31)
Foreign Tech. License	0.51 (2.06)	-1.67* (0.98)	-5.36* (3.03)	-7.25** (3.06)	-3.11* (1.69)
Main Market: Local	-2.09 (1.55)	0.60 (1.07)	3.79 (2.42)	4.21* (2.44)	0.24 (1.43)
Exporter	5.18** (2.05)	2.32 (1.60)	-9.58*** (2.91)	-7.22** (3.02)	-2.14 (1.64)
<5 Years	5.38** (2.35)	3.73* (2.02)	-3.27 (3.41)	0.46 (3.40)	4.03* (2.10)
Audited	-0.24 (1.60)	-0.82 (1.64)	-6.01** (2.65)	-6.81*** (2.52)	-3.50** (1.40)
Informal	5.61 (3.42)	-1.30 (2.41)	1.75 (5.95)	0.51 (6.26)	3.79 (3.62)
Medium Firm	4.19** (1.64)	-2.12* (1.09)	-13.47*** (2.48)	-15.53*** (2.50)	-5.13*** (1.31)
Large Firm	7.15*** (2.40)	-2.51** (1.25)	-20.34*** (3.45)	-22.91*** (3.47)	-8.79*** (1.99)
Liquidity Shock	7.18*** (1.49)	1.31 (1.22)	-3.57 (2.21)	-2.20 (2.19)	2.67** (1.32)
Country x Sector FE	Yes	Yes	Yes	Yes	Yes
N	19444	8692	8804	8692	19332

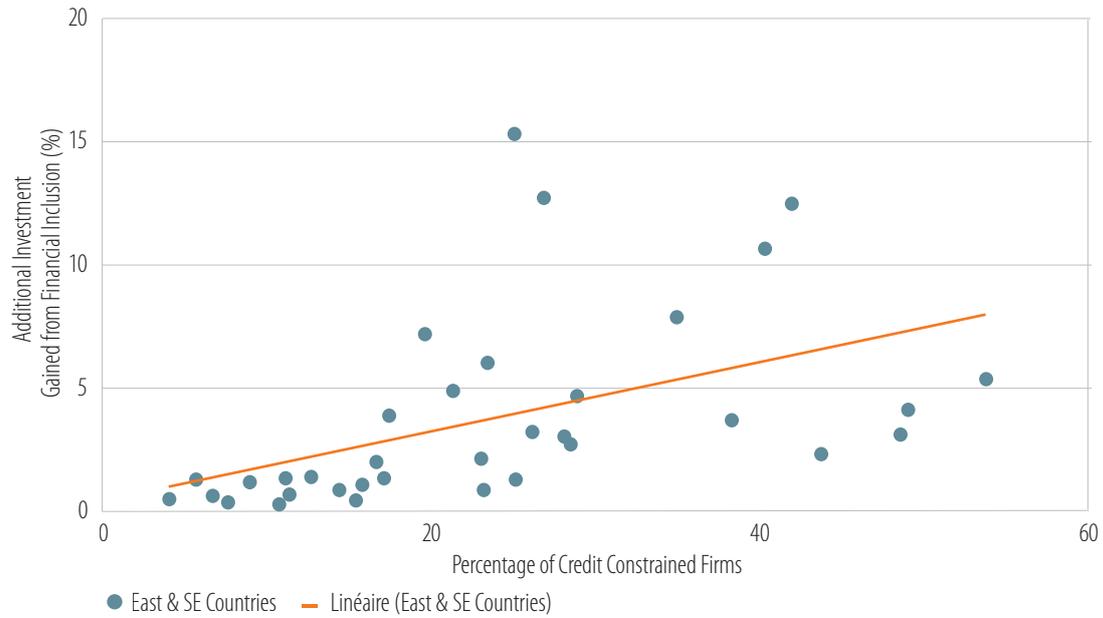
**Table B.2**  
**The impact of COVID-19 on firms' financials and performance**

		Annual Employment Growth	Delayed Payments	Permanently Closed
		(1)	(2)	(3)
Voluntary		-1.58*** (0.56)	-8.15*** (1.92)	0.47 (0.88)
Forced		-2.73*** (0.97)	0.01 (3.35)	0.58 (1.96)
Voluntary = Forced	F	1.359	5.539	0.003
	p	0.244	0.019	0.955
mean (dep. var.)		3.02	25.96	4.40
Country x Sector FE		Yes	Yes	Yes
N		16608	11978	12507
		Used Bank Loans	Used Equity Finance	Used No Ext. Source
		(4)	(5)	(6)
Voluntary		-7.84*** (1.85)	5.21** (2.31)	8.20*** (2.24)
Forced		-9.20*** (3.41)	3.79 (3.89)	4.61 (3.35)
Voluntary = Forced	F	0.160	0.125	0.922
	p	0.689	0.724	0.337
mean (dep. var.)		18.56	32.73	25.69
Country x Sector FE		Yes	Yes	Yes
N		6945	6945	6945

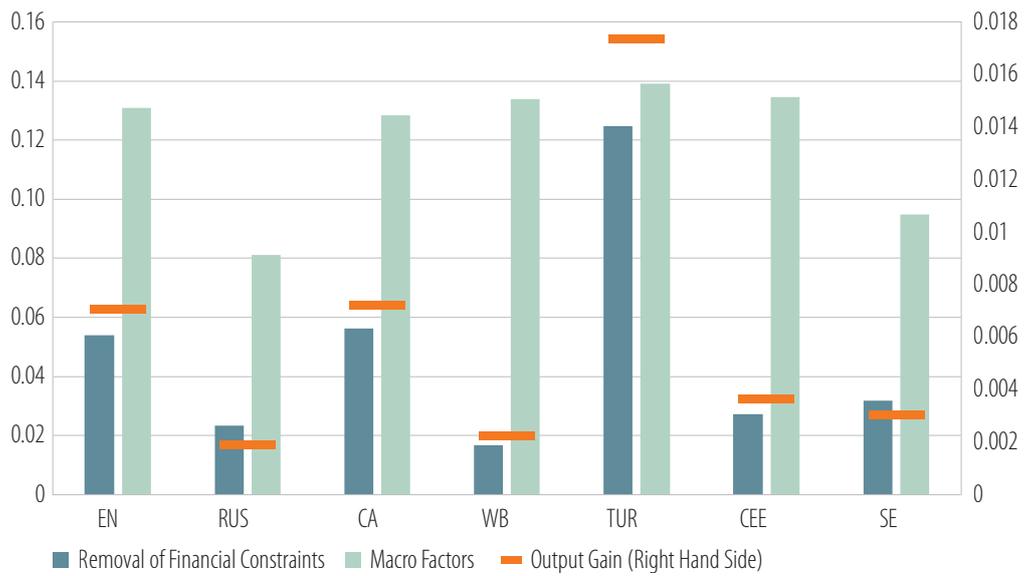
*Note:* Standard errors in parentheses \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

**Annex C**

**Figure C.1**  
**Additional investment under counterfactual scenario (percentage) – an indication of the potential effects of removal of credit constraints on economic growth**



**Figure C.2**  
**Contributions to output gains – an indication of the potential effects of removal of credit constraints on economic growth**



Source: Authors' calculations

## Annex D: Methodological description of the key stages for determining a credit gap

The starting point is to match discouraged firms with those that have obtained loans, and to predict the desired loan volume, conditional on firm characteristics. To do so, a rejection rate should be imputed for firms discouraged from applying for loans. This is obtained via a staged approach.

First, a “scoring” model for those firms that applied for loans and were actually rejected is estimated. A Logit-LASSO is employed to select the relevant explanatory variables and to predict rejections in sample. A 5-fold Cross Validation (CV) method has been applied to select the penalty term  $\lambda$ . Shao (1997) shows that k-fold CV is asymptotically equivalent to BIC. Specifically, the selection method determines 18 regressors out of the many entering the algorithm to be the statistically relevant. Moreover, country and sector fixed effects have been added to the “scoring” model.

$$\hat{\beta}_{LASSO}(\lambda) = \arg \min \left\{ -\ell_{LOGIT}(\beta_0, \beta) + \lambda \|\beta\|_1 \right\}$$

Second, the estimated model is employed out-of-sample to predict the probabilities of rejection for the discouraged firms. This makes it possible to obtain net discouraged shares of firms in each country and region. By doing so, the method screens out firms that would have been rejected had they applied for loans. It adjusts for observable firm specific differences in the pool of non-applicants vis-à-vis the pool of applicants, controlling for country and sectoral unobservable elements.

Third, a mechanism to allocate credit to firms is employed. To do so, credit allocation is based on the risk-aversion  $\mu$  in the banking sector. Following Betz et al (2014), a loss function that incorporates banks’ risk-aversion is used to select a threshold probability to screen out firms:

$$L(\mu) = \mu \frac{FN}{TP + FN} \mathbb{P}(Rejected) + (1 - \mu) \frac{FP}{FP + TN} \mathbb{P}(Not Rejected) \quad \forall \mu \in [0, 1]$$

where FP (FN) stands for false positive (false negative) and represents the share of firms (not rejected) rejected, but that should have been not rejected (rejected) by the credit allocation algorithm; TP (TN) stands for real positive (negative) and represents the share of firms that are classified correctly as (not rejected) rejected.

		Actual	
		Rejected	Not Rejected
Prediction	Rejected	True Positive (TP)	False Positive (FP)
	Not Rejected	False Negative (FN)	True Negative (TN)

For each  $\mu$ , there is a threshold probability minimising this loss function. A bank can be thought of as being concerned about two types of errors:

- High  $\mu$ : rejecting good quality applicants (high TP or FP and low FN or TN)
- Low  $\mu$ : not rejecting bad quality applicants (low TP or FP and high FN or TN)

The parameters are computed on the observable distribution of the accepted/rejected firms. Ultimately, firms with an associated higher probability of rejection than the implied threshold probability are rejected.

Specifically,  $\mu$  is selected to take two alternative values. The value (0.75) where the threshold probability  $P(\text{rejected})$  determines a level of rejection close to the actual rejection rates across firms applying for loans. A value (0.85) that reflects the doubling of the actual rejection rates across firms applying for loans, to ensure that results reflecting higher risk aversion are internalised. Finally, the model determined via the Lasso selection is employed to predict rejections out of sample and the risk-aversion implied threshold picked before to allocate credit to discouraged firms is applied.

Risk Aversion $\mu$	Threshold $P(\text{Rejected})$	TN	FN	FP	TP	mean( <i>Rejected</i> )	mean( $\widehat{\text{Rejected}}$ )	
							in-sample	out-of-sample
0.75	25 %	3584	162	195	149	7.6 %	8.4 %	29.0 %
0.85	16 %	3364	104	415	207		15.2 %	42.6 %

Fourth, the desired loan volume can be aggregated across firms, and expressed as a percentage of the existing loan volume from successful loan applications. Ultimately, this is linked to the existing outstanding credit to enterprises in the economy to determine the actual level of credit gaps as a percentage of GDP.

$$\text{credit gap (underserved credit)} = \frac{(\text{latent demand} - \text{estimated rejections})}{(\text{Expressed demand} - \text{observable rejections})} \times (\text{NFCs credit})$$

## GLOSSARY AND ACRONYMS

Bankruptcy	A legal process for liquidating a firm's assets to pay off its debts. Chapter 1 uses the term bankruptcy and insolvency interchangeably, where insolvency is a financial state where the firm cannot meet its debt payments on time.
BIS	Bank for International Settlements
Business environment	The various domains that affect the day-to-day experiences of firms. Examples include accessing finance, meeting regulatory requirements, infrastructure, corruption, etc.
Business obstacles	Firms are asked to rate an individual business environment obstacle on a 5 point scale. If the firm chooses a 4 or a 5, then that obstacle is a "major obstacle" for the firm.
CA	Central Asia
Capital structure	The mix of debt, equity, and other financing instruments used by a firm to finance its operations.
Carbon emissions	Emissions stemming from the burning of fossil fuels and the manufacture of cement; they include carbon dioxide produced during consumption of solid, liquid, and gas fuels as well as gas flaring.
Carbon intensity	Carbon emissions per unit of energy
CEE	Central and Eastern Europe
Central and Eastern Europe (CEE)	This region includes the following countries: Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia.
Central Asia (CA)	This region includes the following countries: Kazakhstan, Kyrgyzstan, Mongolia, Tajikistan and Uzbekistan.
Climate change	Long-term shifts in temperatures and weather patterns. These shifts may be natural, but since the 1800s, human activities have been the main driver of climate change, primarily due to the burning of fossil fuels (like coal, oil and gas), which produces heat-trapping gases.
Combustible fuels	Coal, oil and gas
Competitiveness	At the firm level, competitiveness can be thought of as the ability to sustain market position by supplying quality products on time—at competitive prices—and the ability to adapt quickly to changes in the external environment. It requires continuous increases in productivity, by shifting from comparative advantages, such as low cost labour, to competitive advantages—competing on efficiency and quality, delivery, and flexibility.
COP	Conference of the Parties
Corporate distress	Situation under which a firm may face serious difficulties to maintain its operations endangering its survival.
Corporate ESG Responsibility composite indicator	An indicator based on ESG-related questions in the Enterprise Surveys, inspired by the Sustainability Accounting Standards Board (SASB) standards.
Corporate policy support	Aid schemes granted by national authorities to firms to mitigate economic shocks and save businesses.
Corporate responsibility	The ethics which drive an organisation's activities and how it operates so that it's viable over the long term. These two factors are intrinsically linked because a business that damages the systems on which it depends will ultimately be unsustainable. In 'doing the right thing' by their stakeholders and sharing the same values, organisations will themselves see benefits from brand enhancement and reputation to building employee engagement. It therefore makes good business sense to operate sustainably.
COV-ES	COVID-19 Follow-up Enterprise Surveys
COVID-19 Follow-up Enterprise Surveys	The report also uses the first round of the COVID-19 Follow-up Enterprise Surveys (covering more than 16 000 firms), carried out by the World Bank to illustrate how firms have reacted and adapted during the crisis.

Credit gaps	A credit gap refers to the difference between the desirable level of credit and the actual level.
Credit-constrained firms	Credit-constrained firms are firms that need loans but were either discouraged from applying or rejected - see Box 1 in Chapter 4 for a comprehensive explanation.
Decarbonisation	Process of reducing carbon dioxide (CO <sub>2</sub> ) emissions resulting from human activity in the atmosphere, with the eventual goal of eliminating them. It is achieved by switching to usage of low carbon energy sources.
Digitalisation	Digitalisation is the use of digital technologies to change a business model; it is the process of moving to a digital business. In particular, firms can be considered digital if they have their own website, are able to sell their products online, or they can implement remote working conditions.
Discouraged firms	Discouraged firms need loans but have refrained from applying because of what they perceive as complex application procedures, unfavourable interest rates, high collateral requirements, insufficient loan amounts, fear of being rejected or other unspecified reasons.
Eastern Neighbourhood (EN)	This region includes the following countries: Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine.
EBRD	European Bank for Reconstruction and Development
ECA	Eastern Europe and Central Asia
EIB	European Investment Bank
EIF	European Investment Fund
Emissions-intensive sectors	Sectors with above-median average carbon emissions per unit of value added: paper and paper products, printing and publishing, coke and petroleum, chemical products, rubber and plastic products, non-metallic mineral products, basic metals, land transport, water transport and air transport.
EN	Eastern Neighbourhood
Energy efficiency	Proxied by the reverse of energy intensity. Energy efficiency improves when a given level of service is provided with reduced amounts of energy inputs or services are enhanced for a given amount of energy input.
Energy intensity	Quantity of energy required per unit output or activity, so that using less energy to produce a product reduces the intensity. At the level of an economy, energy intensity is measured as units of energy per unit of GDP. At the firm level, energy intensity is calculated as units of energy per unit of sales.
Enterprise Survey (ES)	The Enterprise Survey provides a rich source of information about firms and their business environment. The questionnaire includes firm characteristics, annual sales, costs of labour and other inputs, performance measures, access to finance, workforce composition and participation in the labour market. There is also a special module on the green economy. The Enterprise Survey provides a representative sample of the non-agricultural, formal private sector for firms with at least five employees and operating in the manufacturing or services sectors.
ES	Enterprise Survey
ESG	Environmental, social and governance
ESG practices	A set of environmental, social and governance standards for a company's operations. Environmental criteria consider how a company performs as a steward of nature. Social criteria examine how it manages relationships with employees, suppliers, customers, and the communities where it operates. Governance deals with a company's leadership, executive pay, audits, internal controls, and shareholder rights. In Chapter 3, environmental criteria include environmental awareness, green management and green measures; social criteria include gender, education and skills and training; and governance criteria include corporate governance, general management practices, internal controls and audit, business ethics, compensation and innovation.
EU	European Union

Exporters	Firms that export at least 10% of their sales.
Extreme weather events	The most commonly considered examples of extreme weather events include heat waves, cold snaps, heavy rainfall or snowfall, ice or hail storms, droughts, hurricanes, storm surges, and tornadoes.
Financial autarky	Firms in financial autarky are those that have no liability relationship with the banking sector - see Box 1 in Chapter 4 for a comprehensive explanation.
Financial deepening	Increase in the supply of financial services in the economy
Financial lifelines	Liquidity provided to a firm that faces a sudden shortage or unavailability of liquidity to continue its operations.
Firm adaptation	Adaptation strategy concerns specific ways in which the firm makes adjustments, as it seeks to survive and capitalise on external circumstances. Such adjustments can be made in a variety of product, market and resource management areas.
Firm resilience	A firm's capacity to absorb stress, recover critical functionality, and thrive in altered circumstances.
Foreign direct investment (FDI)	Investments made by a foreigner (either individuals or business entities) in a domestic firm (in the form of equity capital, reinvested earnings and intra-company loans), acquiring more than 10% ownership and implying a significant degree of influence on the management of the firm.
Foreign-owned firms	Firms with at least 25% foreign ownership.
Fossil fuel subsidies	A fossil fuel subsidy is any government action that lowers the cost of fossil fuel energy production, raises the price received by energy producers, or lowers the price paid by energy consumers. The most obvious subsidies are direct funding and tax giveaways, but there are many activities that count as subsidies – loans and guarantees at favourable rates, price controls, governments providing resources like land and water to fossil fuel companies at below-market rates, research and development funding, and more.
GDP	Gross domestic product
Global value chains (GVCs)	Global value chains refer to international production sharing, a phenomenon where production is broken into activities and tasks carried out in different countries. Firms belonging to GVCs are both importing and exporting. Global value chains can be measured through the backward participation rate, which is the share of exported value added that is imported for further processing from another country and by the forward participation rate, that is the share of exported value added that will be used for further processing by another importing country.
Global warming	A gradual increase in the overall temperature of the earth's atmosphere generally attributed to the greenhouse effect caused by increased levels of carbon dioxide, CFCs, and other pollutants.
Green economy	A green economy is defined as low carbon, resource efficient and socially inclusive. In a green economy, growth in employment and income are driven by public and private investment in such economic activities, infrastructure and assets that allow reduced carbon emissions and pollution, enhanced energy and resource efficiency, and prevention of the loss of biodiversity and ecosystem services.
Green investment	Investment that increases energy or resource efficiency or reduces carbon emissions and pollution. Measures that result in an increase in the firm's energy efficiency and/or a reduction in pollution or other negative environmental impacts, even if this is achieved as a by-product of achieving other objectives.
Green management	Refers to the way firms address environmental issues and monitor energy usage and pollution. Green management practices assess whether firms have clear, measurable and realistic environmental objectives and whether their managers have the right incentives and expertise to achieve those targets.
GVCs	Global value chains
ICT	Information and communications technology

IEA	International Energy Agency
IMF	International Monetary Fund
Importers	Firms that import at least 10% of their sales.
Informal sector	This term refers to firms operating informally, which means unregistered firms.
Innovation	Introduction of new or improved products, services or processes, or investing in Research and Development.
Internal funds	These are sources of financing internally generated by a firm and not coming from any external - to the firm - source such as a bank.
IPCC	Intergovernmental Panel on Climate Change
ISIC	International Standard Industrial Classification (UN)
Large firm	A firm with at least 100 full-time employees
Liability dollarisation/ euroisation	Denomination of the liability side of an enterprise or a bank in a currency - US dollar or euro - other than that of the country in which they are held.
LMI	Lower-middle-income countries
Lower-middle-income (LMI) countries	This country group is defined following the latest available World Bank income classification and applying it to the set of economies covered by ES - see for details <a href="https://datatopics.worldbank.org/world-development-indicators/the-world-by-income-and-region.html">https://datatopics.worldbank.org/world-development-indicators/the-world-by-income-and-region.html</a>
Management practices	Refer to practices used to address problems arising in operations or production process, to monitor the performance indicators, to implement production targets (such as volume, quality, efficiency, waste or on-time delivery) and to incentives staff and managers' performance.
Medium-sized firm	A firm with 20-99 full-time employees
Middle East and North Africa (MENA)	This region in this publication includes the following countries: Egypt, Jordan, Morocco, Lebanon, Palestine and Israel.
OECD	Organisation for Economic Co-operation and Development
Old firm	A firm that is 5 years old or older.
Productivity	The effectiveness of productive effort, as measured in terms of the rate of output per unit of input. It is defined as value added per employment.
R&D	Research and development
Renewables	Types of energy from renewable resources that are naturally replenished on a human timescale. They include sources such as sunlight, wind, rain, tides, waves, and geothermal heat.
RUS	Russia
SASB	Sustainability Accounting Standards Board
SE	Southern Europe
Small firm	A firm with fewer than 20 full-time employees
SMEs	Small and medium enterprises, defined in the Enterprise Survey as firms with fewer than 100 full-time employees.
Southern Europe (SE)	This region includes the following countries: Cyprus, Greece, Italy, Malta and Portugal.
TFP	Total factor productivity
Trade barriers	Barriers or obstacles that make difficult and/or can reduce or restrict international trading activity and volumes either through non-tariff or tariff measures, and also other characteristics such as distance between countries, whether they share their official language and whether they have a common border.
Trade integration	The share of international trade, both export and import, as a proportion of the country's GDP.
TUR	Turkey
UMI	Upper-middle-income countries

UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
Upper-middle-income (UMI) countries	This country group is defined following the latest available World Bank income classification and applying it to the set of economies covered by the Enterprise Survey – see for details <a href="https://datatopics.worldbank.org/world-development-indicators/the-world-by-income-and-region.html">https://datatopics.worldbank.org/world-development-indicators/the-world-by-income-and-region.html</a>
WB	Western Balkans
WBG	World Bank Group
Western Balkans (WB)	This region includes the following countries: Albania, Kosovo, Montenegro, the Republic of North Macedonia and Serbia.
Young firm	A firm that is younger than 5 years old