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Frank Betz, EIB
Farshad R. Ravasan, Paris School of Economics

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Frank Betz
European Investment Bank

Farshad R. Ravasan
Paris School of Economics

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Abstract

The economies in the Middle East and North Africa have not been able to generate a sufficient number of jobs for a fast growing population. This paper uses data from the MENA Enterprise Survey to investigate the extent to which the prevailing collateral practices affect the allocation of credit and firms' ability to expand and create jobs. In a first step we use matched bank-firm data to recover banks' collateral policies. Exploiting data on the location of firms and bank branches we then aggregate the estimated collateral policies into branch-weighted indices that represent collateral practices at the local level. We find that less stringent collateral regimes are conducive to employment growth. Young firms in particular benefit from lower collateral ratios, while a greater willingness to accept movables benefits both young and old firms.

* Frank Betz, European Investment Bank, 98-100 Boulevard Konrad Adenauer, 2950 Luxembourg, Luxemburg, e-mail: f.betz@eib.org; Farshad R. Ravasan, Paris School of Economics and University of Paris 1 - Panthéon-Sorbonne, B328, Maison des Sciences Economiques 106-112, boulevard de l'Hôpital 75 013 Paris, France, e-mail: farshad.ravasan@sciencespo.fr. Farshad R. Ravasan gratefully acknowledges financial support through the Knowledge Programme of the European Invstment Bank. The authors would like to thank Ralph de Haas for sharing data on the location of bank branches. The views presented in the paper are those of the authors only and do not necessarily represent the views of the European Investment Bank.

1 Introduction

During the protests of the Arab Spring young people voiced their frustration with regimes that deprived them of political participation and economic opportunities. The protests were a potent symbol that the state-centred development model prevailing in the region had run its course. One of the distinct features of this model is a public sector that assumes the role as employer of first and last resort. Unlike in other world regions, public sector wages in MENA are actually higher than those in the private sector. This leads those who can afford to queue for a long time to obtain jobs with limited social returns. In the post-war period, some states issued employment guarantees for university graduates (World Bank (2004)).

The private sector suffers from a business environment that is characterized by wide-ranging microeconomic distortions, including form subsidies. In Egypt, for instance, fuel subsidies accounted for 6 percent of GDP during the fiscal year 2013/2014 (IMF (2015)). While certainly inefficient such distortions create their own constituency, making it politically costly for reform-minded governments to remove them. The bulk of rents this system produces, however, accrue to those at the top. Economic and business elites are closely linked, resulting in a business environment tilted in favour of politically connected firms. In Tunisia, for instance, 64 percent of politically connected firms operate in sectors subject to restrictions on FDI, compared to only 36 percent of non-connected firms (Schiffbauer et al. (2014)).

The opportunity costs of the prevailing systems have been laid bare by demographic trends. According to Malik and Awadallah (2013), between 1996 and 2006 the labour force in the MENA region has grown three times as fast as in the rest of the developing world. As a result close to 6 million new jobs each year were be required to absorb new labour market entrants (World Bank (2004)). Unfortunately, the economies in the region were able to generate only 3.2 million jobs per year during the 2000s, resulting in some of the highest youth unemployment rates in the world (World Bank (2011b)).

The poor labour market outcomes appear to have a financial dimension (World Bank (2011a)). While volumes of private credit are high compared to income peers, the region has some of the highest credit concentration ratios in the world, reflecting connections between large corporate and their banks. Therefore, favourable measures of financial depth do not necessarily translate into financial access for a broad cross-section of firms. Moreover, the institutional environment is not conducive to small business lending. According to Doing Business (World Bank (2016)), this applies especially to the secured transactions framework. Doing Business uses the Strength of Legal Rights Index to represent the quality of the secured transactions framework. As Table 1 shows no economy of the region scores above 2 out of 12 on the Strength of Legal Rights Index, compared to an average of 5 for

middle-income-countries.

Most MENA countries have deficiencies in all components of the chain of secured lending (World Bank (2011a)). The types of movable assets that can be pledged as collateral are limited. Furthermore the priority of secured creditors is often unclear, which makes it difficult to assess the level of protection the collateral offers. The registration of collateral is often paper-based and fragmented. It is therefore difficult to obtain information on existing security rights. Last but not least, the enforcement of security rights is difficult, especially when it comes to enforcing out of court. Speedy enforcement is particularly important for movable assets, which in most cases depreciate over time.

The quality of the secured transaction regime matters, because in principle collateral can facilitate lending in a risky environment through three main channels. First, collateral reduces the risk faced by the bank as losses can be recovered through collateral in case of default. Second, collateral increases incentives for borrowers to repay given the possibility of losing the collateral. Third, collateral mitigates information asymmetries, as information on the quality of the collateral can substitute for borrower information.

However, collateralized lending also comes with its own problems, and the availability of collateral is one of them. On average 78 percent of the capital stock of an enterprise in the developing world typically consists of movable assets such as machinery, equipment or receivables (Love et al. (2013)). Immovable assets such as real estate, on the other hand, account for only 22 percent of the capital stock. If the secured transaction regime penalizes collateralization of movable assets, a large proportion of firms' capital stock remains unused. As a result an otherwise creditworthy borrower will be denied credit, with adverse implications for firm growth.

Second, collateral may tilt the allocation of credit away from firms whose growth prospects are particularly dependent on access to external finance. Hsieh and Klenow (2014) highlight the importance of the fast expansion of firms in early stages of their life cycle in an advanced economy (USA) compared to slow (Mexico) and no expansion (India) in developing economies. This implies that insufficient job creation could partly be explained by external factors that hamper the ability of firms to expand in the early stages of their life cycle.

The availability and cost of external finance is one of those factors.[1] When financial markets are complete and external finance perfectly substitutes for internal finance, firms follow their investment plan to expand regardless of the availability of internal funds. However, as the cost of external finance increases, firms may forego an investment opportunity unless they can finance it internally. Furthermore, the wedge between the cost of internal and external finance is even larger for firms in the early stages of their life cycle, as on average they are likely to be more opaque and to have

[1] See Clementi and Hopenhayn (2006), Binks and Ennew (1996) and Oliveira and Fortunato (2006).

fewer assets that can be pledged as collateral (Schiantarelli (1996) and Hubbart (1998)). As a result the expansion plans of young firms tend to be more sensitive to the availability of external finance ((Moscarini and Postel-Vinay, 2012) and Perez-Quiros and Timmermann (2000)).

In a related paper, Calvo et al. (2012) argue that jobless recoveries following financial crises can be explained by contraction in collateral values, which induces firms to choose more capital-intensive forms of production. Here, we examine whether this mechanism also applies outside recessionary episodes.

This paper draws on a novel dataset to investigate the effect of collateral regimes on the allocation of credit and firm performance. The Middle East and North Africa Enterprise Survey (MENA ES) is a new firm level dataset funded jointly by EBRD, EIB and the World Bank. The MENA ES provides representative samples of the formal private sector in eight MENA economies: Djibouti, Egypt, Jordan, Lebanon, Morocco, Tunisia, West Bank and Gaza, and Yemen. The methodology is compatible with World Bank Enterprise Survey fielded in other world regions including BEEPS. The survey addresses a broad range of business environment issues and includes a detailed set of questions measuring firms' ability to access finance.

EBRD et al. (2016) present first results from the MENA ES. They find that the region is characterized by an unusually high share of firms that state that they do not need a loan. This share is even higher in those economies with comparatively less advanced financial systems. Idiosyncratic variation in project timing and the macroeconomic environment alone cannot explain this phenomenon as a period of economic difficulty may actually increase demand for loans. EBRD et al. (2016) therefore argue that some of the firms that do not need a loan have actually disconnected from the banking sector in the sense that they have adapted production strategies to an environment where banks are not an option even if this comes at the cost of lower firm growth.

The central methodological issues that our empirical strategy needs to address are reverse causality and selection bias. For two reasons, a simple OLS regression of firm growth on the collateral associated with a loan will yield inconsistent estimates. First, it is not clear whether stringent collateral requirements lead firms to grow slower or whether banks require more collateral from slow growing firms. Both channels are plausible and both imply a negative association between collateral requirements, access to finance and employment growth. Second, the collateral requirements associated with a loan are only defined for firms that currently have a loan outstanding. Unfortunately, this does not apply to a significant share of our sample. Such a set-up is likely to understate the effects of collateral policies on employment as it does not take into account that firms can be denied credit because they cannot meet the collateral requirements, or that collateral demands discourage firms from applying in the first place.

To address these challenges we adopt a two-stage procedure. The first

stage recovers each bank's collateral policy. The collateral policy of an individual bank is defined as the average conditional collateral requirement for all clients of that bank. It can be recovered through a regression of the collateral requirement on borrower characteristics and a bank-specific fixed effect. In a second stage, the estimated collateral policies are aggregated into collateral indices, reflecting market practices in the area where the firm is located. To this end we exploit location data to identify all bank branches that are located in a circle with a radius of 10km centred on each firm in the sample. By averaging the estimated collateral policies of all banks with branches in the circle we construct the collateral indices that represent the collateral practices in the vicinity of the firm. We construct two collateral indices in order to represent different aspects of the collateral environment. The first index tracks the ratio of collateral to loan value (the collateral ratio index), whereas the second measures the share of collateralized loans where either machinery and equipment or receivables were pledged as collateral (the movable collateral index). The collateral indices are then used to explain firms' employment growth.

We find that a favourable collateral regime increases employment growth. Lower collateral ratios as represented by the collateral ratio index benefit young firms only. This is consistent with the notion outlined above that young firms are more likely to face a collateral availability constraint. A greater willingness to accept movable collateral as measured by the movable collateral index benefits both young and old firms.

While we have little evidence to expect that the collateral indices are correlated with some unobservable feature of the environment that also affects firm growth, this cannot be ruled out. It is therefore important to show that the collateral environment affects firms' financial choices. In fact, we find that young firms are less likely to disconnect when faced with lower collateral ratios. At the same time they are more likely to have a loan or line of credit outstanding. Movable collateral also reduces firms' propensity to disconnect, though discouragement increases. While at first glance surprising, this pattern could be explained by the strong presence of manufacturing firms in the formal private sector of these economies. Machinery accounts for most of the movable assets pledged as collateral. Such collateral may bear greater resemblance to real estate than to receivables in that it is similarly secure for the bank.

In sum, we provide evidence that the prevailing collateral regime affects firms' financial choices and therefore their employment growth. The evidence, however, is based on the growth patterns of existing firms. To the extent that a benign collateral environment facilitates firm entry our results underestimate the true effect of collateral on employment. Furthermore the evidence comes from variation in collateral practices permitted by a given institutional framework. The estimate may therefore underestimate the benefits from moving to a more modern secured transactions regime. As the Doing Business results suggest, there is ample scope to do so.

We proceed as follows. The next section describes the dataset we use. Section 3 discusses the measurement of credit constraints and the concept of banking sector disconnect. Section 4 presents our identification strategy and section 5 discusses our empirical results. Section 6 concludes.

2 Data

2.1 The MENA Enterprise Survey

The firm level data come from The Middle East and North Africa Enterprise Survey (MENA ES), funded jointly by EBRD, EIB and the World Bank. The MENA ES provides representative samples of the formal private sector in eight MENA economies: Djibouti, Egypt, Jordan, Lebanon, Morocco, Tunisia, West Bank and Gaza, and Yemen. The survey covers manufacturing and service firms with at least five employees, where services includes retail, wholesale, hospitality, repairs, construction, transport and information technology (IT) firms. Not covered by the survey are agriculture, fishing, and extractive industries, as well as utilities and some service sectors such as financial services, education, and healthcare.

The MENA ES addresses a broad range of business environment issues such as access to finance, the extent of corruption, the quality of infrastructure, the prevalence of crime, the intensity of competition, as well as performance measures. The samples are stratified by firm size, sector of activity, and location within the MENA economies. The survey covers 6083 firms in total with sample size ranging from 266 firms in Djibouti to 2897 in Egypt. The MENA ES follows the World Bank's global methodology for enterprise surveys. The data are therefore comparable with enterprise surveys in 126 countries covering more than 94,000 firms. EBRD et al. (2016) presents first results of the MENA ES.

Data collection took place in the aftermath of the Arab Spring. Respondents were interviewed in 2013 and 2014, but the reference period of the survey is firms' fiscal year 2012. Figure 6 illustrates that the data were collected during exceptional times. Respondents are asked to choose from a list of fifteen elements of the business environment the one that currently represents the greatest obstacle to their enterprise. In the MENA ES economies 32 percent of respondents name political instability as the top obstacle compared to only 9.7 percent in the rest of world.

2.2 Access to Finance

The MENA ES measures firm access to finance along various dimensions. In particular, respondents are asked whether they currently have a loan or line of credit outstanding. Figure 6 plots the proportion of firms with an outstanding loan or line of credit against private credit in percent of GDP.

Data on private credit to GDP comes from the World Bank's Global Financial Development Database. Light grey and dark grey lines indicate averages for lower middle income and upper middle income economies.[2] The chart shows both measures to be correlated, though in some cases outcomes diverge. Lebanon, Morocco and Tunisia, compare well to income peers both in terms of financial access and financial depth. Conversely, Egypt, the West Bank and Gaza and Yemen lag behind their income peers, especially in terms of access. Jordan stands out in that a large volume of credit goes hand in hand with low prevalence of bank loans, while the opposite applies to Djibouti. in In any case, according to this metric access to finance does not appear as bad as suggested by earlier work World Bank (2011a).

The MENA ES in addition contains a set of questions that elicit the properties of these loans, which enables us to construct two measures representing collateral requirements. We first measure the collateral ratio, which is given by the ratio of collateral to loan value. To eliminate outliers, we winsorize the variable at the 5th and the 95th percentile of its distribution. We then construct a movable collateral indicator that equals one if the borrower pledged machinery and equipment or receivables to secure the loan. Figure 6 shows that the average collateral ratio in the MENA ES exceeds that of the average lower- and upper-middle income economy, but not dramatically so. The regional average masks considerable variation. For instance, average collateral ratios in Egypt and Yemen are twice that of Jordan and West Bank and Gaza.

To measure credit constraints we rely on a standard set of questions as used for instance in Popov and Udell (2010). The MENA ES first asks firms whether they have applied for a loan in the last fiscal year. Those who respond affirmatively are then asked whether the loan application was approved or rejected. Firms that did not apply for a loan are asked for the main reason they did not apply. Those firms that respond "no need for a loan" are classified as not credit constrained. Firms that cite other reasons such as complex application procedures, too high interest rates or collateral requirements, or simply did not believe that the application would be approved are considered credit constrained.

Figure 6 shows the percentage of unconstrained firms in the MENA ES broken down into firms that do not need a loan and firms with a successful loan application. EBRD et al. (2016) show that the MENA ES economies are characterized by a higher share of firms that are not credit constrained than any other region of the world. In most economies, the percentage of unconstrained firms is indeed high, accounting for 87% of enterprises in Djibouti and Morocco. However, the share of unconstrained firms is driven largely by those that do not need a loan rather than successful applications. This applies especially to the relatively shallow banking systems of Egypt, West Bank and Gaza, and Djibouti. Figure 6 presents the percentage of credit con-

[2]Jordan, Lebanon, and Tunisia are upper-middle income countries; the others are lower-middle income.

strained firms broken down into firms with a rejected loan application and those that were discouraged from applying in the first place. The share of credit constrained firms primarily reflects discouraged firms. Rejected loan applications are rare across the board.

2.3 Employment growth and control variables

Employment growth is the economic outcome we seek to explain. We compute employment growth through expansion for all incumbent firms comparing the number of their full time employees at the end of last fiscal year and three fiscal years ago.

$$g_i = \frac{1}{t_{LFY} - t_{FY-3}} \frac{l_{LFY} - l_{FY-3}}{\alpha l_{LFY} + (1-\alpha) l_{FY-3}} \tag{1}$$

A common choice of weight is to set $\alpha = 1/2$. It has the advantage of making the growth measure symmetric and more comparable across different size groups(Moscarini and Postel-Vinay (2012)). By design the survey only covers firms that have survived until the interview. This implies that our results are subject to survivor bias in the sense that we cannot observe firms that have exited since $FY - 3$.

We construct a set of control variables that may plausibly affect the ability of the firm to either grow or attract external finance.

In particular, the MENA ES questionnaire includes three questions which provide information on gender, education and experience of the firm's manager. *Manager education* assume a value of 1 if the manager holds a university degree and 0 otherwise. University educated managers may find it easier to deal with banks and prepare the necessary documents to obtain a loan. *manager experience* captures how many years of experience the manager has in the present sector. *Female CEO* is a dummy variable that indicates whether the top manager is female. For instance, as a result of discrimination female entrepreneurs may face more difficult access to finance.

The MENA ES further provides information on the ownership of firms. The variable *Foreign ownership* is a dummy variable that takes the value of 1 if it at least 10 percent of the firm is owned by foreign private individual or company. Foreign-owned firms may have access to internal capital markets and therefore be less dependent on the local banking system. The questionnaire also elicits whether the firm is independent or part of a bigger establishment. The variable *Single firm or headquarter* is an indicator equal to one if the firm is a single-plant establishment or the headquarter of a multiplant enterprise. Firms that do not fall in either of the categories may enjoy less financial autonomy are therefore be less likely to interact with banks.

Finally, we construct three measures of firm quality. *Audited* equals one if the firm's accounts have been certified by an external auditor. This reduces information asymmetries and thereby facilitates access to finance.

Exporter is an indicator equal to one if the firms exports at least ten percent of sales. This signals that the firm is competitive in international markets. Finally, *Website* indicates if the firm uses the web in interaction with clients or suppliers, suggesting a comparatively high level of sophistication. Summary statistics are provided in Table REF. Some other studies such as Gorodnichenko and Schnitzer (2013) that use similar data (BEEPS) control in addition for total factor productivity, estimated based on cost shares for labour, material, and capital, adjusted for capacity utilization. Item non-response to quantitative questions in the MENA ES is high implying a large and likely non-random loss of observations, as a result of which we decide to not control for TFP.

In addition to the enterprise data from the MENA ES we use data on the location of bank branches. EBRD has shared with us on data on bank branches in Morocco, Tunisia, Egypt, and Jordan. We have in addition compiled data on the location of bank branches in Lebanon and West Bank and Gaza. Most banks in the region by now provide a list of branches on their websites.[3] Data on bank branches in Yemen is sparse and Djibouti hardly has spatial variation. The subsequent analysis therefore does not take these two economies into account.

3 Measuring credit constraints

For many years have economists attempted to measure firms' financial constraints. One stream of the literature focuses on inferring financial constraints from firms' financial characteristics. As there is no item on a balance sheet that can tell us whether a financial constraint is binding, economists have developed methodologies to infer it indirectly by relying on theories of optimal investment. In this setting external funds are perfect substitutes for internal resources. Investment therefore depends only on present and potential future investment opportunities and lack of internal resources is not a binding constraint per se. The investment opportunity can then be captured by Tobin's Q (Brainard and Tobin (1968) and Tobin (1969)).

The empirical evidence, however, indicates that firms' investment decisions significantly depend on the availability of internal resources even after controlling for Tobin's Q (Blundell et al. (1992)). The seminal paper by Fazzari et al. (1988) has been the first attempt to provide empirical support to interpreting the cash flow sensitivity of investment as a financial constraint. The results have been challenged and augmented by numerous studies such as (Kaplan and Zingales, 1997), (Kaplan and Zingales, 2000), Alti (2003) (Bushman et al., 2011) and Farre-Mensa and Ljungqvist (2015). For instance, Farre-Mensa and Ljungqvist (2015) show that firms classified as financially constrained by the five most common indirect measures do not have any

[3]Branch addresses have been converted into coordinates using the geocode utility developed by Ozimek and Miles (2011).

difficulty obtaining credit when their demand for debt increases as a result of exogenous shocks such as tax increase.

Such findings motivate another line of research that tries to measure financial constraints directly form survey data on bank debt. This literature relies on the notion of financial constraints first developed by Stiglitz and Weiss (1981). They argue that financial markets are imperfect due to asymmetric information. Therefore, in equilibrium, credit is allocated by rationing rather than by price leading to excess credit demand. However (Kon and Storey, 2003) argue that in the presence of application cost some firms may decide not to apply for a loan in spite of their demand for external finance. They call this process of shutting out the credit market "self-rationing" and they call the firms concerned "discouraged borrowers". Popov and Udell (2010) observe that credit constraints more frequently assume the form of discouragement rather than rejected loan applications, a finding consistent with Figure 6. Several studies provide evidence on the negative effects of binding credit constraints among discouraged firms or how they closely resemble rejected firms.[4]

As discussed above the MENA ES economies are characterized by an unusually high share of firms that are not credit constrained. Figure 6 suggests that this quantity is if anything weakly correlated with the prevalence of bank funding. Egypt and Lebanon, for instance, display a similar proportion of unconstrained firms despite their vastly different financial system characteristics. Considering the turmoil that the region is going through the high ratio of unconstrained firms is surprising. Decomposing the unconstrained firms into firms that do not need a loan and approved borrowers it turns out that the high ratio of unconstrained firms in MENA ES economies comes from the former group.

Egypt, West Bank and Gaza, and Yemen exhibit the highest share of firms that do not need a loan in their unconstrained firms. EBRD et al. (2016) show that these firms are less likely to view access to finance as a major concern, are less likely to have purchased fixed assets, and are less likely to plan an expansion. These findings also hold after accounting for standard set of firm characteristics.

Does the high share of firms that do not need a loan reflect a lack of investment opportunities? While plausible this perspective ignores that investment opportunities are to some extent endogenous. Financial constraints can lead firms to adjust their economic activity so as to reduce their reliance on external finance to a minimum. Financial constraints could therefore discourage firms from fast growing businesses that requires more investment and entail a greater dependence on external funds. In this case firms strategically choose to disconnect from financial sector and therefore they pursue activities that are less demanding in terms of investment. EBRD

[4]See Cole (2008) Berkowitz and White (2004) and Berger et al. (2011) for the United States, Brown et al. (2011) and Popov and Udell (2010) for Europe, and Chakravarty and Xiang (2013) for developing countries.

et al. (2016) call these firms *disconnected* and we label this type of self-rationing from credit markets *hidden discouragement*.

One could argue that this pattern of low demand reflects just idiosyncratic variation in investment timing and therefore does not reflect a disconnect from the banking system. However, Figure 6 indicates that disconnected firms are also less likely to use the banking system for payments purposes. The share of firms with a checking or savings account is lowest in Yemen, where only 48 percent of firms in the formal sector have a bank account, followed by Egypt and West Bank and Gaza. These economies also exhibit the highest share of disconnected firms as a proportion of the not credit constrained firms, which in all cases exceeds 90 percent. This pattern supports the notion that these firms are indeed opting out of the banking system.

4 Empirical strategy

This study examines the effect of collateral policies on employment growth. For two reasons, a simple regression of employment growth on collateral requirements most likely yields inconsistent estimates. First, the collateral requirements associated with a loan are only defined for firms that currently have a loan outstanding. Unfortunately, this does not apply to a significant share of our sample. Such a set-up is likely to understate the effect of collateral policies on employment growth as it does not take into account that firms can be denied credit because they cannot meet the collateral requirements, or that collateral demands discourage firms from applying in the first place. Second, OLS estimates could be biased due to reverse causality. Do stringent collateral requirement lead firms to grow slower or do banks require more collateral from slow growing firms? Both channels are plausible and both imply a negative association between collateral requirements, access to finance and employment growth.

To address these challenges we adopt a two-stage procedure. The first stage recovers each bank's collateral policy. In a second stage, the estimated collateral policies are aggregated into collateral indices, reflecting market practice applied by banks in the area where the firm is located.

The first stage exploits information on the identity of the bank granting the last loan or line of credit. This information is not part of the publicly available micro data. It enables us to construct a dataset of borrowers and lenders. The collateral policy of an individual bank is then defined as the average conditional collateral requirement for all clients of that bank. It can be recovered through a regression of the collateral requirement on borrower characteristics and a bank-specific fixed effect. Borrower characteristics control for the idiosyncratic features of the client that may affect collateral demands. The bank-specific fixed effect then represents the collateral policy.

In the second stage we use the estimated collateral policies to obtain

a representation of collateral practices at the local level. We use the geo-coordinates to identify all bank branches that located in a circle with a radius of 10km centred on each firm in the sample. Then by averaging the estimated collateral policies of all banks with branches in the circle we construct the collateral indices that represent the collateral practices prevailing in the vicinity of the firm. The indices are branch-weighted such that banks with a greater number of branches in the circle receive greater weight in the index. Banks that do not have any branches receive a weight equal to zero.

In practice we construct two collateral indices in order to represent different aspects of the collateral environment. The first index tracks the ratio of collateral to loan value (the collateral ratio index), whereas the second measures the share of collateralized loans where either machinery and equipment or receivables were pledged as collateral (the movable collateral index). The collateral ratio index is given by the negative of the average collateral ratio assigned to the firm's local banking network. As it is the negative of the collateral value to the value of the loan, higher values imply lower collateral ratios. The movable collateral index is given by the share of bank branches willing to lend against movable collateral and varies between zero and one. Thus, if banks that are more likely to accept movable collateral have a larger share of branches close to the firm, this will be represented by a higher score of the corresponding movable collateral index.

While we have little evidence to expect that the collateral indices are correlated with some unobservable feature of the environment that also affects firm growth, this cannot be ruled out a priori. It is therefore important to show that collateral practices affects firms' financial choices. In particular, the analysis examines four potential channels through which collateral practices can shape firms' financial structure. First, EBRD et al. (2016) have shown that the region is characterized by an unusually high share of firms that do not need finance, which we view as a form of self-rationing. We therefore study whether collateral practices affect a firm's propensity to disconnect from the banking system. Second, Figure 6 shows that most credit constrained firms are discouraged from applying for a loan. We therefore also consider the effect on discouragement. Third, given that we know why a firm is discouraged and our hypothesis specifically relates to collateral, we implement an additional specification that looks at whether a firm is discouraged due to strict collateral requirements. Lastly, we examine whether more client-friendly collateral practices do indeed increase the probability to have a bank loan or line of credit.

5 Results

5.1 Estimating banks' collateral policies

We start our empirical analysis by estimating banks' collateral policies. Table 3 presents the results. The dependent variable in Column (1) is given by the value of collateral as a percentage of the loan amount. The dependent variable in Column (2) is a dummy variable equal to one when firms are allowed to pledge their movable assets as collateral and zero otherwise. As borrower characteristics may systematically affect the collateral banks demand, both specifications include our standard set of firm-level covariates. We saturate the model with sector and time fixed effects. The variables of interest are the bank-specific fixed effects as they pick-up banks' collateral policies.[5]

The F-statistics indicate that the bank specific characteristics are significant in defining our both collateral metrics. Borrower characteristics that affect the average collateral ratio are age and exporter status. Young firms and exporter exhibit on average lower ratios of collateral to loan value. Whether a firm can pledge movable assets appears less sensitive to firm characteristics. On the contrary, and most of variation in the intensity of movable collateral lending can be explained by lender-specific collateral policy. The small number of observations relative to the overall sample size of the MENA ES reflects the limited number of firms with a loan or line of credit outstanding.

5.2 Local collateral practice and employment growth

Table 4 shows how local collateral practice affects firms' ability to expand and create new jobs. The dependent variable in both columns is employment growth during the last three fiscal years. In addition to country and sector fixed effects, the specification includes the standard set of covariates. *collateral environment* is the explanatory variable of interest that represents collateral practices prevaling in the vicinity of the firm. This variable acts as a credit-supply shifter that can affect firms' employment growth through financial constraints. In Column (1), *collateral environment* is given by the collateral ratio index, in Column (2) by the movable collateral index.

Column (1) of Table 4 shows that in line with the literature firms less than five years old exhibit on average faster employment growth. The interaction term between the age indicator and *collateral environment* is statistically significant. This shows that these firms grow even faster if they are located in areas where banks that demand less collateral have a stronger presence.

[5]We assign different fixed effects to same bank when it operates in different countries, but this applies only to a small number of banks - mainly Jordanian banks that also operate in West Bank and Gaza.

The insignificant coefficient on *collateral environment* and the statistically significant coefficient for the interaction term confirm that the impact of local presence of banks with less stringent collateral policy is indeed limited to young firms. Older firms are less sensitive to this aspect of collateral policy.

Column (2) of Table 4 reports results for the movable collateral index. The regression suggests that firms' ability to expand increases if they are located in areas with a stronger presence of banks that are more likely to let firms pledge their movable assets as collateral. Moreover, in contrast to lower collateral ratios, the positive effect of lending against movable collateral applies to both young and old firms.

5.3 Financial channels

We argue that local collateral practice can affect firms' ability to create jobs through easing or tightening financial constraints. In this section we support our argument by directly relating collateral policies to financial constraints. Table 5 presents results on *collateral environment* as represented by the collateral ratio index.

In Column (1) we estimate the effect of *collateral environment* on firms' propensity to disconnect from the banking system. The collateral ratio index has no impact itself on the propensity to disconnect. Likewise, young firms do not differ from old firms. Interestingly, however, young firms do display a lower likelihood to disconnect when faced with a favourable collateral environment as reflected in the significant interaction term. Column (2) looks at discouragement and it turns out that there is no effect of the collateral ratio index on discouragement. Next, Column (3) examines a specific cause for discouragement, namely discouragement due to high demands for collateral. Both *collateral environment* and the interaction term have a negative sign, but are not statistically significant individually. They are however jointly significant. Column (4) goes one step further and reports results for impact of *collateral environment* on firms' propensity to have a loan or a line of credit. In line with the results in Column (1) young firms are more likely to have a loan when they benefit from a benign collateral environment.

Table 6 presents the corresponding results for movable collateral. Column (1) shows that when the local banking system is more conducive to firms pledging movable assets as collateral, the firms are less likely to disconnect. The results in Column (2) on the other hand indicate that firms are more likely to report that they were discouraged from applying for a loan. According to the results in Column (4) a stronger presence of banks that are willing to lend against movable collateral does not translate into a higher prevalence of loans. Though one can argue that discouraged firms are closer to the financial system than disconnected firms in the sense that they do desire external finance the evidence remains inconclusive.

Nevertheless, the results matter in three ways. First, the impact of local collateral practices on financial constraints is consistent with the impact on

employment growth - this applies at least to the collateral ratio index. Second, we observe that the local collateral environment affects firms' financial constraints through a shift in the supply of credit, which is captured by a change in the propensity of firms to have a credit line. Third, the collateral environment also affects their decision to adjust their activity and ultimately job creation according to the degree of financial constraints they face. This is reflected in reduced credit demand through firms' propensity to disconnect from the banking system.

5.4 Robustness checks

In the aftermath of the Arab Spring, the MENA ES economies have gone through a period of high political instability. As shown in Figure 6 MENA stands out for the highest proportion of firms that rank political instability as the top obstacle (32 percent) compared with their comparators in the rest of the developing world (10 percent). Even in Sub Saharan Africa only 18 percent of firms choose political instability as the top obstacle to their enterprise. It could be therefore be argued that our results are driven by regional political instability that acts as omitted variable and affects both employment growth and the collateral practices of banks operating in the region.

Including the firm level political instability index, We reestimate the regression specifications for Employment Growth, Disconnection and Credit in Table 7. We construct a *Political Instability* index which is a dummy variable equal to one when firms declare political instability as a *major* or *very severe* obstacle for their enterprise and zero otherwise. The results indicate that all our main findings hold after controlling for political instability.

The MENA ES firm identifier does not necessarily correspond to an independent economic unit. Fortunately, the MENA ES provide us with information that enables us to determine whether a plant belongs to a company that is headquartered elsewhere. The financial states of these plants are less likely to be sensitive to their local banking system as they are financially connected to their headquarter, which could be located in a region with a very different collateral environment. To rule out this caveat we reestimate our regressions on the subsample of single-plant firms as well as the headquarters of multi-plant companies. Table 8 has the results, which are consistent with the baseline.

6 Conclusion

Drawing on a novel firm-level dataset, this paper provides evidence that a favourable collateral regime can increase employment growth. Lower collateral ratios index benefit young firms only. This is consistent with the notion that young firms are more likely to face a collateral availability constraint. A greater willingness to accept movable collateral benefits both

young and old firms. While we have little reason to expect that the collateral indices are correlated with some unobservable feature of the environment that also affects firms growth, this cannot be ruled out a priori. It is therefore important to show that the collateral environment affects firms' financial choices. In fact, we find that young firms are less likely to disconnect when faced with lower collateral ratios. At the same time they are more likely to have a loan or line of credit outstanding. Movable collateral also reduces firms' propensity to disconnect, though discouragement increases. As the estimates exploit variation in collateral practices permitted by a given institutional framework our estimates may underestimate the benefits from moving to a more modern secured transactions regime.

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Appendix

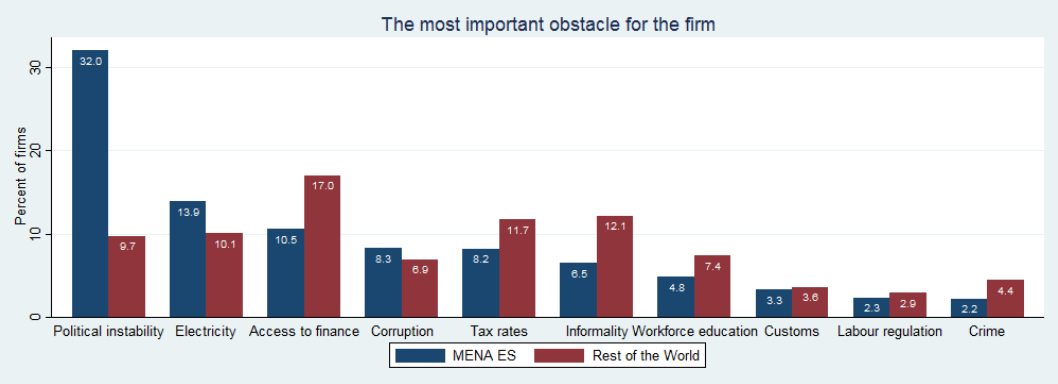

Figure 1: The most important obstacle to the firm

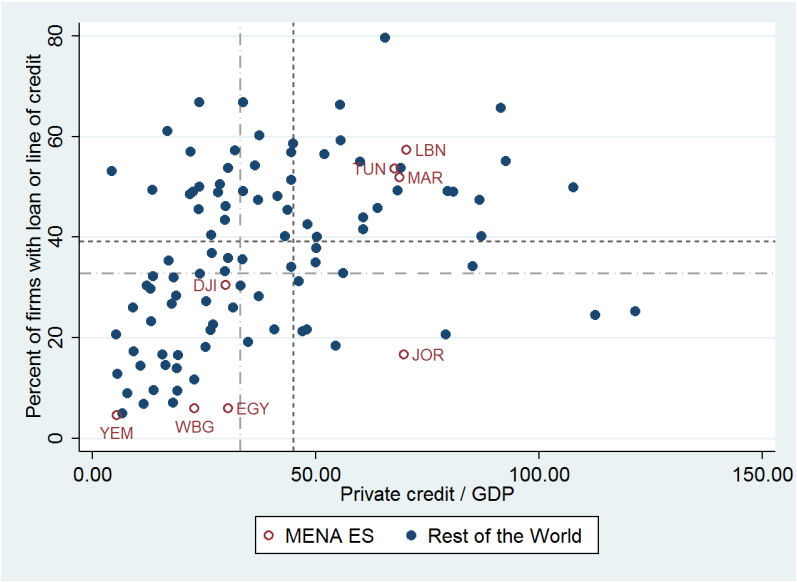

Figure 2: Percent of firms with a loan or line of credit and private credit to GDP.[7]

[7]Data on private credit to GDP comes from the World Bank's Global Financial Development Database. Light grey and dark grey lines show averages for lower middle income and upper middle income economies.

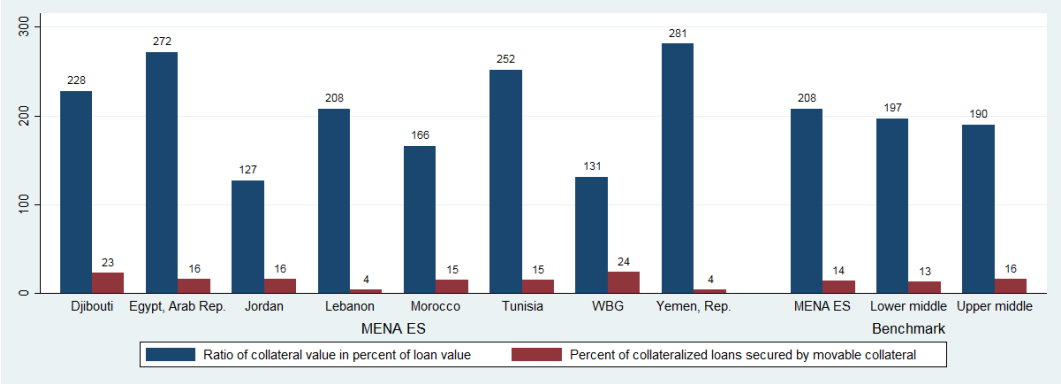

Figure 3: Collateral requirements in MENA ES economies and income peers

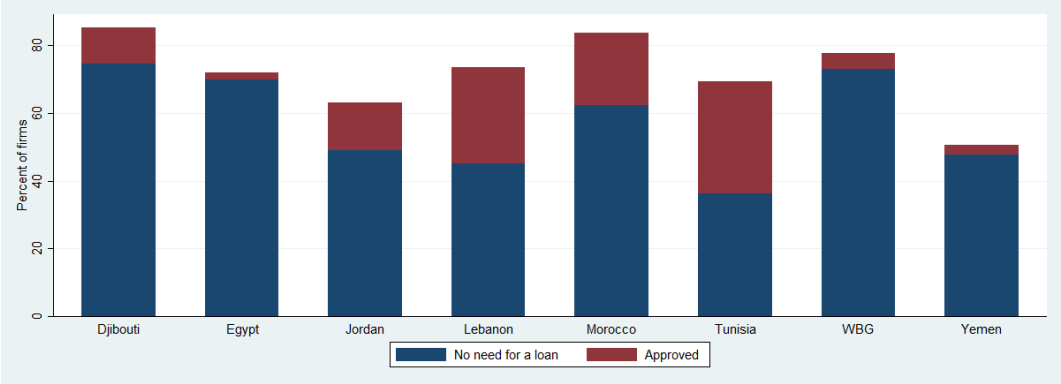

Figure 4: Percent of firms that are not credit constrained and breakdown into firms that do not need a loan and those with successful loan applications

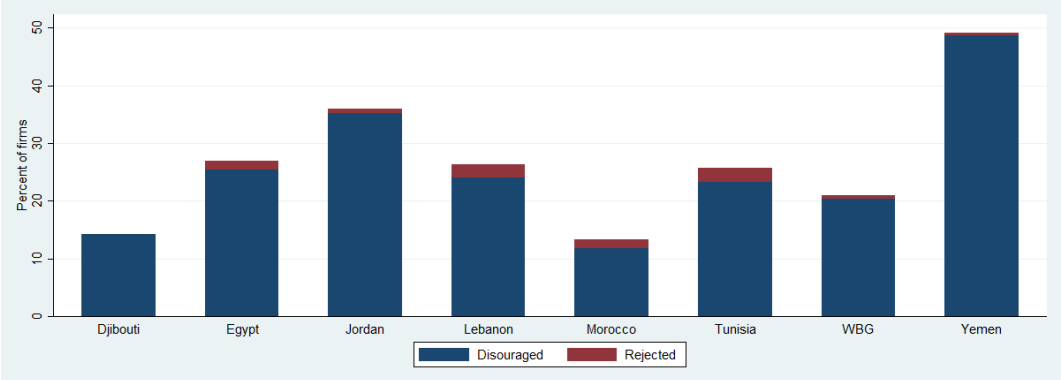

Figure 5: Percent of firms that are credit constrained and breakdown into firms that are discouraged and those with rejected loan applications

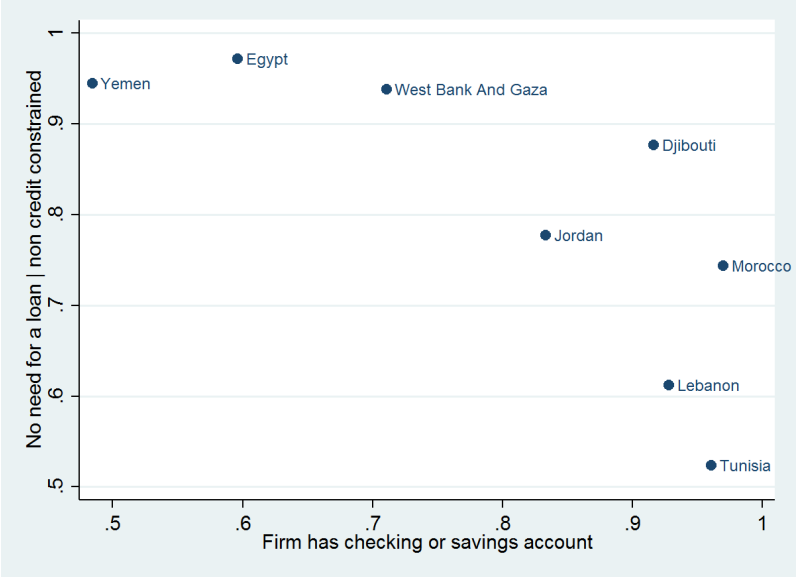

Figure 6: Disconnect from the banking sector concerns both credit and the use of payment services

Table 1: Doing Business: getting credit

Economy	Getting credit rank	Strength of legal rights index (0-12)	Depth of credit information index (0-8)
Djibouti	181	1	0
Egypt, Arab Rep.	79	2	8
Jordan	185	0	0
Lebanon	109	2	6
Morocco	109	2	6
Tunisia	126	2	5
West Bank and Gaza	109	0	8
Yemen, Rep.	185	0	0
MENA ES	135	1.1	4.1
Lower middle income	89	5.2	4.3
Upper middle income	82	5.3	4.8
High income: nonOECD	91	4.6	4.7
High income: OECD	55	5.8	6.5

Table 2: Summary statistics

	Employment Growth		Sectoral Composition		Age and Size		Manager Characteristics		
	(1) All firms	(2) Younger than 5 years	(3) Manu-facturing	(4) Retail	(5) Younger than 5 years	(6) SME	(7) University degree	(8) Experience in years	(9) Female CEO
Morocco	0.167	0.497	0.380	0.090	0.087	0.882	0.780	22.388	0.043
Jordan	0.118	0.197	0.446	0.149	0.177	0.937	0.615	17.738	0.024
Egypt	-0.039	0.040	0.551	0.156	0.330	0.932	0.799	18.354	0.071
Lebanon	0.067	0.422	0.268	0.263	0.135	0.938	0.721	27.552	0.044
Tunisia	0.021	0.250	0.422	0.057	0.102	0.888	0.704	24.574	0.085
West Bank and Gaza	0.226	0.326	0.494	0.195	0.224	0.995	0.404	17.877	0.012

	Firm Organization			Firm Quality				
	(10) Foreign owned	(11) Multi-plant firm	(12) HQ	(13) Audited accounts	(14) Exporter	(15) Website	(16) Political instability	(17) Number of firms
Morocco	0.120	0.142	0.126	0.473	0.119	0.694	0.313	407
Jordan	0.051	0.103	0.073	0.544	0.250	0.452	0.193	573
Egypt	0.072	0.135	0.101	0.690	0.074	0.353	0.770	2897
Lebanon	0.029	0.154	0.135	0.844	0.318	0.640	0.906	561
Tunisia	0.117	0.061	0.044	0.745	0.302	0.663	0.593	592
West Bank and Gaza	0.021	0.147	0.107	0.575	0.224	0.309	0.740	434

Note: The Table presents statistics on employment growth, employment growth of young firms, sectoral composition between manufacturing, retail and services, share of firms younger than 5 years old, share of SMEs (firms which have less than 100 permanent employees), share of firms whose manager has a university degree, average experience of the manager, share of firms with female CEO, share of firms which more than 10% of them owned by private foreign individuals, companies or organizations, share of firms that are part of larger multiplant establishment, share of firms that are Head Quarter (HQ) of multiplant establishment, share of audited firms, share of firms that exports, share of firms that use web services to communicate with clients and suppliers, share of firms that declare political instability is "Major" or "very severe" obstacle and total number of firms by country.

Table 3: First stage regression

Dependent Variable	(1) Value of collateral (% of the loan amount)	(2) Movable Collateral If they are allowed Y=1
younger than 5 years	-40.950**	0.071
	(20.54)	(0.06)
sme	8.728	-0.049
	(14.53)	(0.04)
exporter	-29.226**	-0.009
	(14.75)	(0.04)
female CEO	-20.589	-0.006
	(27.41)	(0.07)
audit	-19.411	0.076*
	(17.25)	(0.04)
manager with university degree	-14.312	0.073*
	(14.83)	(0.04)
manager's experience	-0.573	-0.000
	(0.55)	(0.00)
foreign ownership	-32.065	0.115*
	(23.01)	(0.06)
Constant	242.874***	0.688***
	(67.56)	(0.19)
Time	Yes	Yes
Sectors	Yes	Yes
Banks Fixed Effects	Yes	Yes
σu	84.328	.362
σe	133.538	.449
ρ (fraction of variance due to u_i)	.285	.393
F test that all $u_i = 0$:	$F(66, 476) = 1.37$ $Prob > F = 0.034$	$F(81, 756) = 2.49$ $Prob > F = 0.000$
Observations	568	863

*Note: OLS regression in column (1) and Probit regression in column (2) based on survey-weighted observations (Stata's svy prefix). Both regressions are estimated on the subsample of firms with a loan or line of credit. The dependent variable in column (1) is value Of collateral required for the most recent loan measured as a percentage of the loan amount. The dependent variable in column (2) is a dummy variable takes value 1 when movable collateral (machinery and receivable accounts) are accepted by bank, and firms did not pledge any real estate or personal assets beside these movables. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels respectively.*

Table 4: Local collateral practices and employment growth

Dependent variable:	Collateral Environment based on	
Employment Growth	(1) Collateral Ratio Index b/se	(2) Movable Collateral Index b/se
Collateral Environment	-0.001	0.792**
	(0.00)	(0.38)
0-5 years	0.135**	0.130**
	(0.05)	(0.05)
0-5 years × Collateral Environment	0.013**	
	(0.01)	
Initial size (Log)	-0.112***	-0.111***
	(0.01)	(0.01)
exporter	0.049	0.049
	(0.03)	(0.03)
female CEO	-0.088	-0.084
	(0.05)	(0.05)
audit	0.042	0.044
	(0.03)	(0.03)
manager with university degree	0.032	0.031
	(0.03)	(0.03)
manager's experience	-0.004***	-0.004***
	(0.00)	(0.00)
Firm is part of a larger firm	0.043	0.042
	(0.04)	(0.04)
foreign ownership	0.039	0.033
	(0.04)	(0.04)
Website	0.048	0.049*
	(0.03)	(0.03)
Constant	0.463***	0.468***
	(0.06)	(0.06)
Countries	Yes	Yes
Sectors	Yes	Yes
Observations	4256	4256

*Note: OLS regressions in these two columns using survey-weighted observations (Stata's svy prefix). The dependent variable In column (1) is a dummy variable takes value 1 "Collateral Environment" has been constructed based on a branch-weighted average of the collateral ratio policies of banks that have branches in a circle with radius 10km centered on the sample firm. Similarly, in column (2) "Collateral Environment" has been constructed based on branch-weighted average of the movable collateral policies of banks that have branches in a circle with radius 10km centered on the sample firm. Bank policies are estimated as bank-specific effects in the fixed effect regressions reported in table 3. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels respectively.*

Table 5: Local collateral practices as represented by the collateral ratio index and firms' financial choices

	(1) Disconnected	(2) Discouraged	(3) Discouraged due to high collateral requirements	(4) Firm has a loan
	b/se	b/se	b/se	b/se
Collateral Environment	0.011	-0.002	-0.017	-0.003
	(0.01)	(0.01)	(0.01)	(0.01)
0-5 years	-0.125	0.129	0.157	-0.252
	(0.12)	(0.13)	(0.25)	(0.16)
0-5 years × Collateral Environment	-0.029**	0.004	-0.013	0.036*
	(0.01)	(0.01)	(0.02)	(0.02)
sme	0.131	0.481***	0.716**	-0.534***
	(0.12)	(0.17)	(0.28)	(0.14)
exporter	-0.007	0.161	0.074	-0.005
	(0.11)	(0.13)	(0.22)	(0.12)
female CEO	-0.107	0.119	-0.497	0.012
	(0.19)	(0.21)	(0.44)	(0.20)
audit	-0.069	-0.222**	-0.369**	0.464***
	(0.10)	(0.11)	(0.18)	(0.12)
manager with university degree	0.068	-0.208*	-0.271	0.186
	(0.10)	(0.11)	(0.17)	(0.12)
manager's experience	0.005	-0.004	-0.002	0.004
	(0.00)	(0.00)	(0.01)	(0.00)
Firm is part of a larger firm	-0.189	0.104	0.357	0.171
	(0.13)	(0.13)	(0.31)	(0.15)
foreign ownership	0.214	-0.146	0.012	-0.338**
	(0.15)	(0.19)	(0.25)	(0.17)
Website	0.081	-0.151	0.204	0.001
	(0.10)	(0.11)	(0.18)	(0.11)
Constant	0.469**	-1.170***	-2.656***	-1.502***
	(0.22)	(0.26)	(0.39)	(0.26)
Countries	Yes	Yes	Yes	Yes
Sectors	Yes	Yes	Yes	Yes
Observations	4855	4855	4855	4723

*Note: Probit regressions in all columns using survey-weighted observations (Stata's svy prefix). The dependent variable in column (1) is a dummy variable takes value 1 if firm states that it does not need a loan. The dependent variable in column (2) is a dummy variable takes value 1 if firm does not apply for a loan for any reason other than no need for a loan due to sufficient funds. The dependent variable in column (3) is a dummy variable takes value 1 if firm does not apply for a loan due to high collateral requirements. The dependent variable in column (4) is a dummy variable takes value 1 if firm has a loan. "collateral environment " has been constructed based on branch-weighted average of the movable collateral policies of banks that have branches in a circle with radius 10km centered on the sample firm. Bank policies are estimated as bank-specific effects in the fixed effect regressions reported in table 3.. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels respectively.*

Table 6: Local collateral practices as represented by the movable collateral index and firms' financial choices

	(1) Disconnected	(2) Discouraged	(3) Discouraged due to high collateral requirements	(4) Firm has a loan
	b/se	b/se	b/se	b/se
Collateral Environment	-3.147**	4.609***	-0.578	-1.328
	(1.47)	(1.68)	(2.26)	(2.08)
younger than 5 years	-0.099	0.116	0.186	-0.236
	(0.12)	(0.13)	(0.24)	(0.16)
sme	0.122	0.490***	0.689**	-0.534***
	(0.12)	(0.17)	(0.28)	(0.14)
exporter	-0.004	0.162	0.056	-0.004
	(0.11)	(0.13)	(0.22)	(0.12)
female CEO	-0.120	0.125	-0.506	0.010
	(0.19)	(0.21)	(0.44)	(0.20)
audit	-0.085	-0.204*	-0.376**	0.458***
	(0.10)	(0.11)	(0.18)	(0.12)
manager with university degree	0.072	-0.214*	-0.271	0.179
	(0.10)	(0.11)	(0.17)	(0.11)
manager's experience	0.006	-0.004	-0.002	0.004
	(0.00)	(0.00)	(0.01)	(0.00)
Firm is part of a larger firm	-0.179	0.099	0.343	0.177
	(0.13)	(0.14)	(0.31)	(0.15)
foreign ownership	0.227	-0.169	0.050	-0.343**
	(0.15)	(0.19)	(0.23)	(0.17)
Website	0.083	-0.151	0.194	0.010
	(0.10)	(0.11)	(0.18)	(0.11)
Constant	0.458**	-1.190***	-2.511***	-1.486***
	(0.22)	(0.26)	(0.39)	(0.27)
Countries	Yes	Yes	Yes	Yes
Sectors	Yes	Yes	Yes	Yes
Observations	4855	4855	4855	4723

*Note: Probit regressions in all columns using survey-weighted observations (Stata's svy prefix). The dependent variable in column (1) is a dummy variable takes value 1 if firm states that it does not need a loan. The dependent variable in column (2) is a dummy variable takes value 1 if firm does not apply for a loan for any reason other than no need for a loan due to sufficient funds. The dependent variable in column (3) is a dummy variable takes value 1 if firm does not apply for a loan due to high collateral requirements. The dependent variable in column (4) is a dummy variable takes value 1 if firm has a loan. "collateral environment " has been constructed based on a branch-weighted average of the collateral ratio policies of banks that have branches in a circle with radius 10km centered on the sample firm. Bank policy is estimated as bank-specific effects in the fixed effect regression reported in Table 3. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels respectively.*

Table 7: Employment growth, financial constraints, and political instability

	Collateral Environment based on Collateral Ratio Index				
	(1) Employment growth	(2) Disconnected	(3) Discouraged	(4) Discouraged due to high collateral requirements	(5) Firm has a loan
	b/se	b/se	b/se	b/se	b/se
Collateral Environment	-0.001	0.011	-0.002	-0.017	-0.003
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
0-5 years	0.130**	-0.139	0.132	0.164	-0.242
	(0.05)	(0.12)	(0.13)	(0.25)	(0.16)
0-5 years × Collateral Environment	0.013***	-0.029**	0.004	-0.014	0.034*
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Political Instability Index	-0.042	-0.171*	0.043	0.117	0.138
	(0.03)	(0.10)	(0.11)	(0.15)	(0.11)
Countries	Yes	Yes	Yes	Yes	Yes
Sectors	Yes	Yes	Yes	Yes	Yes
Observations	4256	4855	4855	4855	4723

	Collateral Environment based on Movable Collateral Index				
	(6) Employment growth	(7) Disconnected	(8) Discouraged	(9) Discouraged due to high collateral requirements	(10) Firm has a loan
	b/se	b/se	b/se	b/se	b/se
Collateral Environment	0.803**	-3.046**	4.589***	-0.633	-1.393
	(0.37)	(1.48)	(1.68)	(2.26)	(2.07)
0-5 years	0.125**	-0.113	0.118	0.193	-0.226
	(0.05)	(0.12)	(0.13)	(0.24)	(0.16)
Political Instability Index	-0.039	-0.165*	0.029	0.106	0.149
	(0.03)	(0.10)	(0.11)	(0.15)	(0.11)
Countries	Yes	Yes	Yes	Yes	Yes
Sectors	Yes	Yes	Yes	Yes	Yes
Observations	4256	4855	4855	4855	4723

*Note: All regressions are using survey-weighted observations (Stata's svy prefix). Political instability Index is a dummy variable takes value 1 if firm declares that political instability is "Major" or "very severe" obstacle and takes value 0 otherwise. In columns (1) control variables included but not reported include initial size (log), manager education, exporting status, gender of the manager, foreign ownership, multi-establishment firms, having a website, having audited financial reports. In all other columns (2 to 5), control variables that are included but not reported include dummy variable which takes value 1 if firm is a small or medium size establishment with less than 100 employees, manager education, exporting status, gender of the manager, foreign ownership, multi-establishment firms, having a website, having audited financial reports. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels respectively.*

Table 8: Employment growth, and financial constraints in the subsample of single firms and headquarters of multi-plant firms

	Collateral Environment based on Collateral Ratio Index				
	(1) Employment growth	(2) Disconnected	(3) Discouraged	(4) Discouraged due to high collateral requirements	(5) Firm has a loan
	b/se	b/se	b/se	b/se	b/se
Collateral Environment	-0.001	0.011	-0.001	-0.018	-0.003
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
0-5 years	0.138***	-0.134	0.134	0.168	-0.225
	(0.05)	(0.12)	(0.12)	(0.25)	(0.15)
0-5 years × Collateral Environment	0.012**	-0.029**	0.004	-0.011	0.036*
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Countries	Yes	Yes	Yes	Yes	Yes
Sectors	Yes	Yes	Yes	Yes	Yes
Observations	4054	4625	4625	4625	4507

	Collateral Environment based on Collateral Ratio Index				
	(6) Employment growth	(7) Disconnected	(8) Discouraged	(9) Discouraged due to high collateral requirements	(10) Firm has a loan
	b/se	b/se	b/se	b/se	b/se
Collateral Environment	0.871**	-3.439**	4.839***	-0.227	-1.517
	(0.37)	(1.49)	(1.71)	(2.20)	(2.13)
0-5 years	0.136**	-0.110	0.123	0.185	-0.208
	(0.05)	(0.12)	(0.12)	(0.24)	(0.16)
Countries	Yes	Yes	Yes	Yes	Yes
Sectors	Yes	Yes	Yes	Yes	Yes
Observations	4054	4625	4625	4625	4507

*Note: All regressions are using survey-weighted observations (Stata's svy prefix). and have been conducted on the subsample of single Firms and HQ of multiplant firms.In columns (4) and (9) dependent variable is a dummy takes value 1 if firm does not apply due to high collateral requirements. In columns (1) and (6) Other control variables included but not reported include initial size (log), manager education, exporting status, gender of the manager, foreign ownership, multi-establishment firms, having a website, having audited financial reports. In all other columns (2 to 5 and 7 to 10), control variables that are included but not reported include dummy variable which takes value 1 if firm is a small or medium size establishment with less than 100 employees, manager education, exporting status, gender of the manager, foreign ownership, multi-establishment firms, having a website, having audited financial reports. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels respectively.*

Economics Department
economics@eib.org
www.eib.org/economics

Information Desk
+352 4379-22000
+352 4379-62000
info@eib.org

European Investment Bank
98-100, boulevard Konrad Adenauer
L-2950 Luxembourg
+352 4379-1
+352 437704
www.eib.org