

Credit Information and Firms' Access to Finance: Evidence from an Alternative Measure of Credit Constraints

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This note analyzes the role of credit information in firms' access to finance using a credit constraint variable from World Bank Enterprise Surveys and credit information data from Doing Business for 111 economies. The findings show that small and medium-size firms are more likely to be credit constrained. Also, a more advanced credit information system is associated with lower levels of credit constraints, particularly for smaller firms, firms that are not externally audited or firms that lack a quality certification.

Access to finance remains one of the main challenges to private sector development. Globally, more than 15% of firms identify access to finance as the main constraint for their operations, making it the most commonly identified obstacle.¹ While a quarter of firms use banks to finance their investments, only 15% of these firms' total investments are financed by banks. The bulk of investments (71%) are financed internally.² The total credit gap for small and medium-size enterprises was estimated at between \$2.1 and \$2.6 trillion in 2013. Furthermore, 55-68% of formally-registered small and medium-size firms in developing economies were estimated to be either unserved or underserved by the formal financial sector.³

Credit information systems—where credit reporting service providers (CRSPs) collect and distribute data on the repayment histories of borrowers—are a key element of an economy's financial infrastructure that can contribute to improving access to finance.⁴ This policy note provides evidence on the importance of credit information in addressing firms' financing constraints and explores whether there is an association between the presence and quality of credit information systems and the degree to which firms' access to finance is constrained. It presents the results of simple statistical and regression analyses using data from World Bank Enterprise Surveys and *Doing Business* covering almost 60,000 firms in 111 economies over the period from 2010 to 2016.

An alternative measure of credit constraints for firms

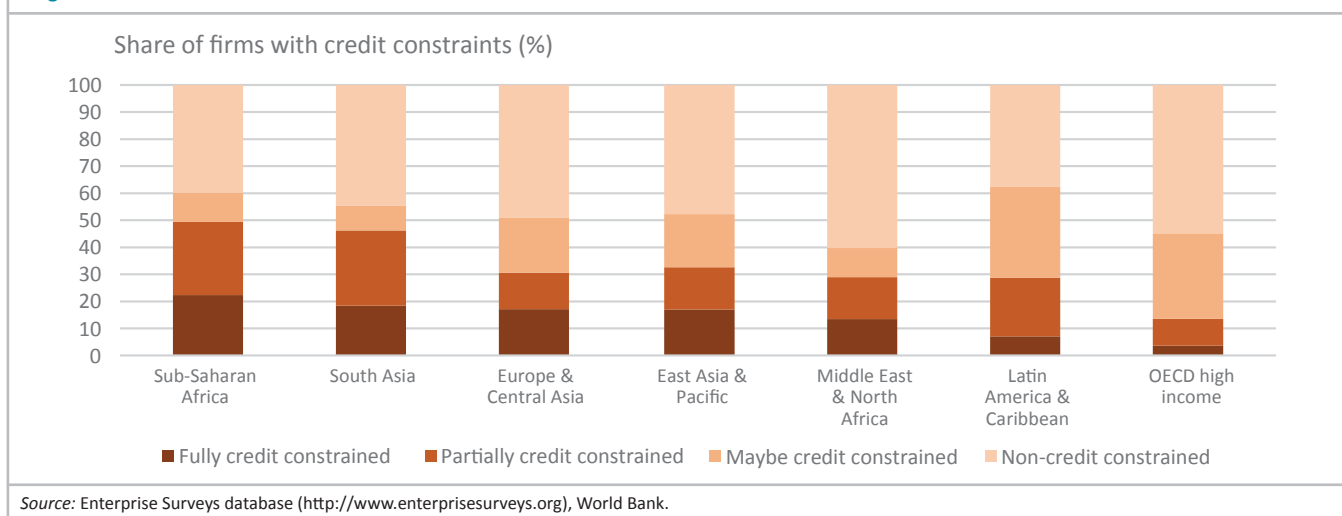
This analysis utilizes an alternative measure of the credit constrained status of firms developed by Kuntchev and others (2014) using firm responses to World Bank Enterprise Surveys questionnaires. These questions include: (i) whether the firm used external sources of finance

for working capital and investments in the previous fiscal year; (ii) whether the firm sought new financing in the previous fiscal year; (iii) whether the financing was obtained or not; and (iv) if the firm did not request a new loan in the previous fiscal year, the reasons for not doing so. The authors find that the likelihood of a firm being credit constrained is inversely related to its size and that small and medium-size firms are more reliant than larger firms on trade credit and informal sources to finance their working capital and investments.

Using this measure, 15.9% of firms in the sample covered by this policy note are classified as "fully credit constrained." These are firms that—in the previous fiscal year—did not use external sources of finance for either working capital or investments, applied for a loan but did not have an outstanding loan disbursed at the time of the survey or did not apply for a loan due to any reason other than having sufficient capital. Firms classified as "partially credit constrained" represent 19.8% of the sample. This group includes firms that had access to external sources of finance but did not apply for a loan due to any reason other than having sufficient capital or did apply for a loan but the application was rejected. In contrast, 18.2% of firms are classified as "maybe credit constrained." These firms—which used external sources of finance and applied for a loan and obtained it—are considered to be maybe credit constrained as, based on the survey responses, it is impossible to tell whether they were partially rationed on the terms and conditions of their external finance. Finally, 46.1% of firms are classified as "non-credit constrained." These include firms that did not apply for a loan because they determined that they had sufficient capital to meet their needs for both working capital and investments. There is no clear evidence that the last two groups experience credit constraints.

A regional comparison shows that firms in OECD high-income economies face the lowest level of credit constraints, with less than 14% on average being either partially or fully credit constrained (figure 1). On the other hand, 22.3% of firms in Sub-Saharan Africa are fully credit constrained and 27.1% are partially credit constrained. In total, almost 50% of firms in this region experience some degree of financing constraints. Similarly, more than 46% of firms in South Asia are either fully or partially credit constrained.

Figure 1. Firms in Sub-Saharan Africa and South Asia face the most credit constraints

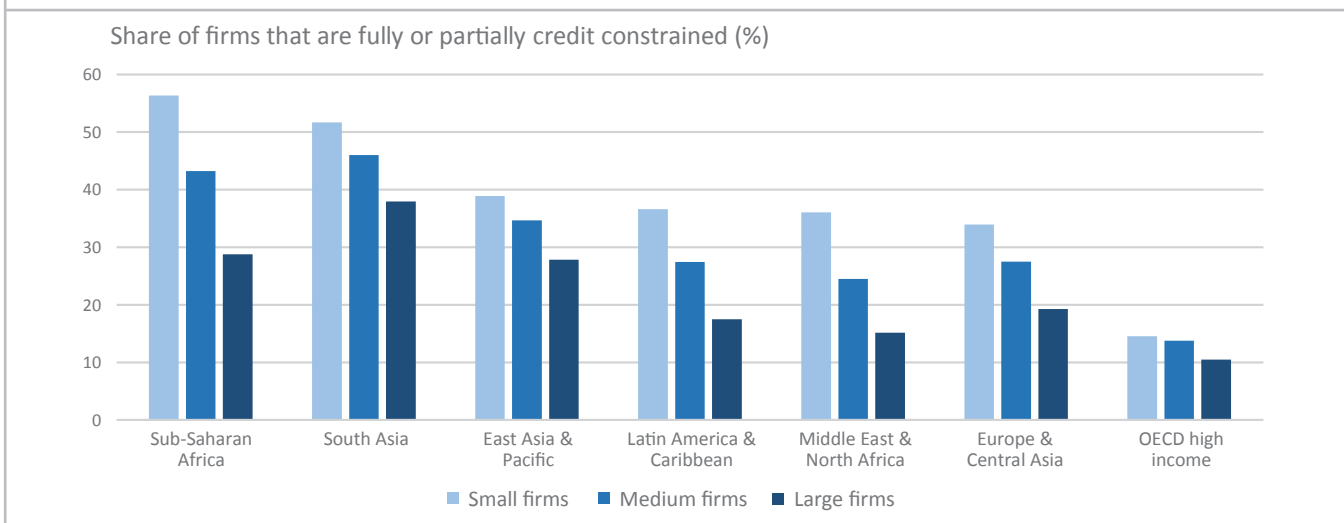


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Figure 2. Small firms experience more financing constraints in all regions



Source: Enterprise Surveys database (<http://www.enterprisesurveys.org>), World Bank.
Note: Firm size is defined based on the classification of World Bank Enterprise Surveys. Small firms are those that have less than 20 employees, medium firms are those that have between 20 and 99 employees and large firms are those that have 100 or more employees.

Small and less transparent firms are more credit constrained

Age, size and ownership structure are reliable predictors of a firm's financing constraints—younger, smaller, domestic firms are more likely to report that accessing finance is an obstacle to their operations.⁵ Furthermore, there are clear differences between small and large firms and these vary depending upon the region where they operate (figure 2). In all regions, small firms experience more financing constraints (either partially or fully) than large firms. However, in OECD high-income economies, the difference between the share of small firms and large firms that are credit constrained is only 4%. In contrast, the difference in Sub-Saharan Africa is much larger—56% of small firms are credit constrained compared to almost 29% of large firms. Bigsten and others (2003) found that small firms in six African economies are less likely than large firms to obtain loans and that this is associated with higher expected profitability demands on the part of banks when providing credit to small firms in these economies.⁶

Using the credit constrained status of firms as the dependent variable, this policy note tests the relationship between firm characteristics and their financial constraints through regression analysis. According to the results, size is a significant determining factor of a firm's credit constraints (table 1). Small and medium-size firms have a higher likelihood of being credit constrained than large firms; age does not have a clear impact. Non-exporting firms⁷ exhibit higher financing constraints than exporters, consistent with findings in the literature that firms facing lower credit constraints and a lower risk of bankruptcy are more likely to be exporters.⁸ This could be because exporting firms typically perform better than non-exporting firms—and therefore have fewer financial constraints—or because financially better-off firms self-select into the export sector. The results also show that non-

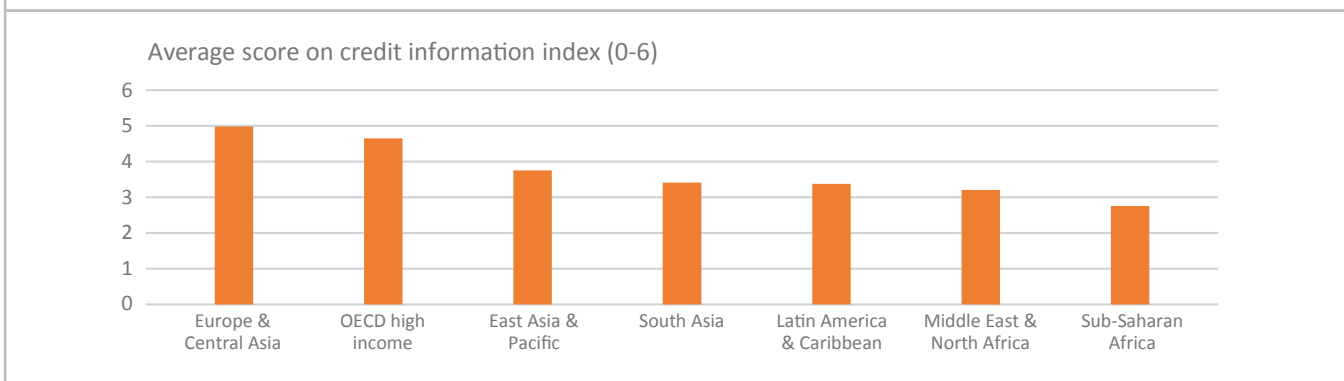
transparent firms and firms lacking quality certification experience a higher degree of financing constraints. Indications of firm transparency and quality can have an effect on firm access to finance as the cost of screening potential borrowers might increase in the absence of indicators such as externally-audited financial statements or quality certifications.⁹

The role of credit information

A well-functioning credit information system can improve the prospects for access to finance by addressing information asymmetries in credit markets. Asymmetries arise when borrowers have more information than lenders regarding their ability to repay loans and the risks associated with their investment projects.¹⁰ As a result, lenders are unable to differentiate between good and bad borrowers; they react by rationing credit, worsening market inefficiencies.

Credit information can improve a lender's knowledge of a potential client and their likelihood of repayment. It can reduce the informational rents that lenders extract from customers in the absence of information sharing, improve borrower discipline and reduce incentives for borrower over-indebtedness.¹¹ Information sharing can also provide data that are highly predictive of whether a firm will fail to meet its credit obligations.¹² Also, the use of credit data in the form of credit scores allows lenders to engage with potential borrowers from a greater distance, relying less on information obtained through personal interactions when making lending decisions.¹³ Recent research also indicates that reforms introducing private credit bureaus can have a significant effect on firm financing, including a 7% increase in the likelihood that a firm will secure a loan and a 5% reduction in the interest rate charged.¹⁴

Figure 3. Economies in Europe and Central Asia score highest on the depth of credit information index



Source: Doing Business database.

Differences in credit information sharing around the world

The *Doing Business* depth of credit information index measures the rules and practices affecting the coverage, scope and accessibility of credit information available through a CRSP in an economy. Of the 111 economies included in this analysis, 92 have a credit bureau, a credit registry or both. Of these, 37 economies have only a private credit bureau, 27 have only a public credit registry and 28 have both types of CRSPs. For this study, the index scores are based on a scale from 0 to 6, with higher values indicating the availability of more credit information.¹⁵ Economies in Europe and Central Asia have the highest score on average (5) followed by OECD high-income economies (4.7).¹⁶ In contrast, the lowest score (2.8) is recorded for the economies of Sub-Saharan Africa (figure 3).

The depth of credit information index measures the features of an economy’s credit reporting system against established good practices.¹⁷

One point is assigned for economies where data on individuals and firms are collected and reported. Another point is given where data on loan amounts below 1% of income per capita are distributed. In this study’s sample, these features are present in 87 and 82 of the economies, respectively. The index also assigns 1 point for the distribution of both positive and negative credit information (73 economies) and 1 point for the distribution of data from retailers and utility companies (34 economies). In addition, 1 point is given for the distribution of at least two years of historical data (69 economies) and 1 point is given for the right, by law, for borrowers to inspect their own data in the largest credit bureau or registry (70 economies). Since 2004 more than 290 reforms introducing and improving credit reporting systems have been adopted in all regions. In 2015/16 alone, 27 economies made reforms in this area.¹⁸ All members of the Association of Southeast Asian Nations (ASEAN) have taken steps to increase the availability of credit information (box 1).¹⁹

Box 1. Credit information reform trends in ASEAN economies

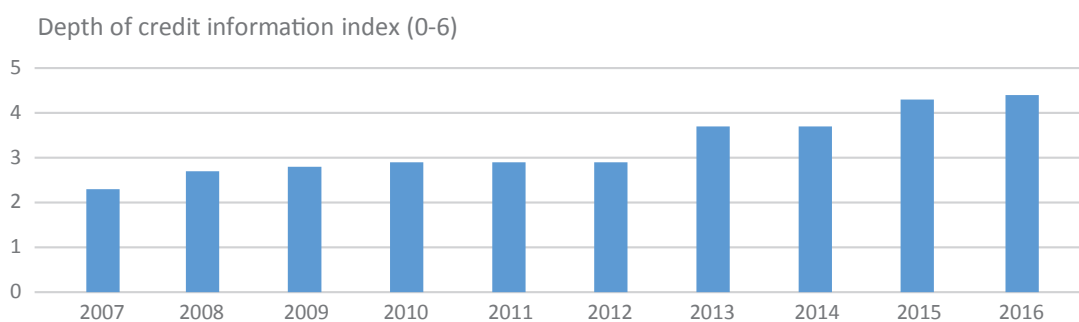
In the last 10 years, all ASEAN economies have adopted reforms in the area of credit information. Several established new credit bureaus or registries while others improved their existing systems by adopting good practices. As a result, these economies have raised their scores in the *Doing Business* depth of credit information index. The average score for the group has increased from 2.3 points in 2007 to 4.4 points in 2016 (on a scale of 0 to 6).

Establishing a new credit reporting system is a process that involves several stages. New regulations must be adopted, for example, to allow the collection and distribution of data on borrowers’ repayment histories and CRSPs must be licensed. Under the supervision of their central banks, the Lao People’s Democratic Republic and Brunei Darussalam established new credit registries in 2011 and 2012, respectively, while credit bureaus in Cambodia and Vietnam obtained licenses to operate in 2012 and 2013. The Financial Institutions Law, which was recently adopted in Myanmar, allows for the operation of credit bureaus in the country and the collection and sharing of data from financial institutions. Once a credit bureau becomes operational in Myanmar, all ASEAN economies will have a credit information sharing arrangement in place.

Reforms to existing credit reporting systems have also helped to expand their coverage. This has been achieved through specific measures such as the collection and distribution of data from alternative sources or the elimination of the minimum threshold for loans to be included in CRSP databases. The credit registry in Brunei Darussalam, for example, started to collect and distribute data from two utility companies in the first half of 2016. Data on delinquent accounts from the Department of Electrical Services and DST Communications Sdn Bhd, a telecommunications operator, are now collected by the registry and included in its credit reports.

Other economies have strengthened their existing credit reporting systems by increasing transparency and improving CRSP services. Many ASEAN economies now guarantee the right of borrowers to inspect their own data in the largest credit bureau or registry, allowing them to monitor their credit history; this can increase their understanding of how their repayment behavior affects their chances of obtaining future loans. This type of reform was implemented in Indonesia, the Philippines, Singapore and Vietnam. The adoption of credit scoring services has been another common reform in ASEAN economies. In 2015/16 alone, the credit bureaus in three economies—Cambodia, Malaysia and Thailand—began offering credit scores as a value-added service for lenders to assess the likelihood of repayment of new loans more effectively.

Reforms in ASEAN economies have strengthened credit information



Source: *Doing Business* database.

Note: The figure is based on the previous *Doing Business* methodology where the depth of credit information index had a value of between 0 and 6. Historical data using the expanded methodology are not available for the years before 2013.

Small and less transparent firms seem to benefit from more credit information sharing

The results of the regression analysis show that the presence of credit information sharing is associated with lower levels of credit constraints for firms, suggesting that the more information available on the credit history of borrowers, the less likely it is that firms will be credit constrained (table 1). In addition, private credit bureaus (but not public credit registries) are associated with lower financing constraints.²⁰

This analysis also suggests that a more developed credit information

system is associated with lower credit constraints for small and medium-size firms (compared to large firms) as well as for firms that are opaque and lack quality certification. These findings are similar to those of previous studies. Love and Mylenko (2003), for example, show that small and medium-size firms tend to have a higher share of bank financing and lower perceived credit constraints in economies where private credit bureaus exist. Similarly, Brown and others (2009) find that information sharing is more valuable for firms that follow less stringent accounting standards by enabling them to overcome the problem of adverse selection.

Table 1. Dependent variable: credit constrained status

	(1)	(2)	(3)	(4)	(5)
Small firm	0.198*** (-0.046)	0.186*** (-0.045)	0.873*** (-0.126)	0.190*** (-0.045)	0.191*** (-0.045)
Medium firm	0.068** (-0.028)	0.062** (-0.029)	0.385*** (-0.088)	0.069** (-0.028)	0.068** (-0.028)
Age (log)	-0.027 (-0.027)	-0.019 (-0.026)	-0.014 (-0.026)	-0.017 (-0.026)	-0.018 (-0.026)
Unaudited	0.177*** (-0.062)	0.174*** (-0.063)	0.169*** (-0.063)	0.466*** (-0.117)	0.171*** (-0.063)
Non-certified firm	0.055* (-0.03)	0.053* (-0.029)	0.067** (-0.029)	0.057** (-0.029)	0.445*** (-0.134)
Non-exporter	0.092*** (-0.035)	0.095*** (-0.034)	0.091*** (-0.031)	0.093*** (-0.033)	0.097*** (-0.033)
Credit information index		-0.053* (-0.027)	0.053* (-0.027)	-0.02 (-0.029)	0.02 (-0.028)
Small firm*			-0.154*** (-0.027)		
Credit information index			-0.068*** (-0.017)		
Medium firm*					
Credit information index					
Unaudited*				-0.069*** (-0.027)	
Credit information index					
Non-certified firm*					-0.087*** (-0.028)
Credit information index					
Observations	59,285	59,285	59,285	59,285	59,285
R2	0.045	0.046	0.049	0.047	0.047

Source: *Doing Business* Enterprise Surveys database (<http://www.enterprisesurveys.org>), World Bank.
Note: Ordered logit regression with credit constrained status as the dependent variable where 1 = non-credit constrained firm; 2 = maybe credit constrained; 3 = partially credit constrained; and 4 = fully credit constrained. Controls for GDP per capita, GDP growth, private credit to GDP, rule of law, inflation plus regional dummies are included in the regressions but the coefficients are not reported. *p<0.1; **p<0.05; ***p<0.01

Conclusion

The results of the analysis using the World Bank Enterprise Surveys variable on the credit constrained status of firms and *Doing Business* data on the depth of credit information show that firm size and transparency are two of the most important determinants of access to finance for firms. In addition, the presence of an information sharing system—particularly a private credit bureau—and credit reporting systems that incorporate good practices are associated with lower credit constraints. Finally, small and less transparent firms benefit most from the availability of credit information in the market.

Significant differences are evident across regions, both in terms of credit information and the credit constrained status of firms. Economies in Sub-Saharan Africa have the least-developed credit reporting systems and firms in this region are more likely to be credit constrained. The implementation of reforms in several economies is encouraging. As more economies enhance their financial infrastructure through more advanced credit information systems, the credit gap faced by entrepreneurs in the developing world can be gradually reduced.

References

- Beck, Thorsten, Asli Demirgüç-Kunt, Luc Laeven and Vojislav Maksimovic. 2006. "The Determinants of Financing Obstacles." *Journal of International Money and Finance* 25 (6): 932–52.
- Bigsten, Arne, Paul Collier, Stefan Dercon, Marcel Fafchamps, Bernard Gauthier, Jan Willem Gunning, Abena Oduro, Remco Oostendorp, Cathy Patillo, Mans Soderbom, Francis Teal and Albert Zeufack. 2003. "Credit Constraints in Manufacturing Enterprises in Africa." *Journal of African Economics* 12 (1): 104–25.
- Brown, Martin, Tullio Jappelli and Marco Pagano. 2009. "Information Sharing and Credit: Firm-Level Evidence from Transition Countries." *Journal of Financial Intermediation* 18 (2): 151–72.
- DeYoung, Robert, W. Scott Frame, Dennis Glennon and Peter Nigro. 2011. "The Information Revolution and Small Business Lending: The Missing Evidence." *Journal of Financial Services Research* 39 (1–2): 19–33.
- Djankov, Simeon, Caralee McLiesh and Andrei Shleifer. 2007. "Private Credit in 129 Countries." *Journal of Financial Economics* 84 (2): 299–329.
- Jappelli, Tullio, and Marco Pagano. 2006. "The Role and Effects of Credit Information Sharing." In *The Economics of Consumer Credit*, edited by G. Bertola, R. Disney and C. Grant, 347–71. Cambridge, MA: MIT Press.
- . 2002. "Information Sharing, Lending and Defaults: Cross-Country Evidence." *Journal of Banking and Finance* 26 (10): 2017–45.
- Kallberg, Jarl G., and Gregory F. Udell. 2003. "The Value of Private Sector Business Credit Information Sharing: The US Case." *Journal of Banking and Finance* 27.3 (2003): 449–69.
- Kuntchev, Veselin, Rita Ramalho, Jorge Rodríguez-Meza and Judy S. Yang. 2012. "What Have We Learned from the Enterprise Surveys Regarding Access to Finance by SMEs?" Enterprise Analysis Unit, Finance and Private Sector Development Vice Presidency, World Bank Group, Washington, DC.
- Love, Inessa, and Nataliya Mylenko. 2003. "Credit Reporting and Financing Constraints." Policy Research Working Paper 3142, World Bank, Washington, DC.
- Martinez Peria, M. S., and S. Singh. 2014. "The Impact of Credit Information Sharing Reforms on Firm Financing." Policy Research Working Paper 7013, World Bank, Washington, DC.
- Muüls, Mirabelle. 2015. "Exporters, Importers and Credit Constraints." *Journal of International Economics* 95.2 (2015): 333–43.
- Padilla, A. Jorge, and Marco Pagano. 2000. "Sharing Default Information as a Borrower Discipline Device." *European Economic Review* 44.10 (2000): 1951–80.
- Stein, Peer, Oya Pinar Ardic and Martin Hommes. 2013. "Closing the Credit Gap for Formal and Informal Micro, Small and Medium Enterprises." Working Paper 94911, International Finance Corporation, Washington, DC.
- Stiglitz, Joseph E., and Andrew Weiss. 1981. "Credit Rationing in Markets with Imperfect Information." *The American Economic Review* 71 (3): 393–410.

NOTES

- Enterprise Surveys database (<http://www.enterprisesurveys.org>), World Bank.
- Enterprise Surveys database (<http://www.enterprisesurveys.org>), World Bank.
- Stein, Pinar Ardic and Hommes 2013.
- Jappelli and Pagano 2002; Djankov and others 2007.
- Beck and others 2006.
- Bigsten and others 2003.
- Non-exporting firms are those with less than a 10% share of exports in sales based on their responses to the World Bank Enterprise Surveys questionnaire.
- For example, see Muüls (2014).
- Brown, Jappelli and Pagano. 2009. In this study transparent firms are defined as those firms which had their annual financial statements checked and certified by an external auditor. Firms with quality certifications are those that have received an internationally-recognized quality certification. These two variables are obtained from the firms' responses to the World Bank Enterprise Surveys questionnaire.
- Stiglitz and Weiss 1981.
- Padilla and Pagano 2000; Jappelli and Pagano 2006.
- Kallberg and Udell 2003.
- DeYoung and others 2010.
- Martinez Peria and Singh 2014.
- As part of a methodology expansion in *Doing Business 2015*, the depth of credit information index increased from a maximum of 6 points to a maximum of 8. Since historical data for the two new elements (availability of credit scores and online access for data users) are only available for 2013–2016, they are not included in this analysis.
- Twenty-one of the economies covered in this study obtain the maximum of 6 points.
- The methodology for the depth of credit information index is available from: <http://www.doingbusiness.org/Methodology/Getting-Credit>.
- Doing Business* database.
- The members of ASEAN are: Brunei Darussalam, Cambodia, Indonesia, the Lao People's Democratic Republic, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam.
- Similar findings were made by Love and Mylenko (2003).