OBSTACLES TO PRODUCTIVITY IN ASIA AND PACIFIC REGION: FINANCE REIGNS

Filipe Lage de Sousa

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Filipe Lage de Sousa

Fluminense Federal University - Brazil

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Obstacles to Productivity in Asia and Pacific Region: Finance Reigns[*]

by

Filipe Lage de Sousa

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Abstract

Firms face difference obstacles for their development. This paper investigates which obstacle is the largest to firms' productivity using micro-level data for the Asia and Pacific region. Access to finance shows the most robust result in our investigation, being stronger for SMEs. Removing SMEs' credit constraints seem to be a powerful tool to promote economic growth in the region, particularly in the manufacturing sector.

I.   Introduction

Since the 1990s, industry's contribution to value-added in GDP has declined somewhat in the Asia-Pacific region; from approximately 39.1% to 38% in 2012. However, at the same time, its share in total employment has expanded by more than a fifth and now accounts for one in four workers (ESCAP, 2015), suggesting that, compared to other sectors, productivity in industry has declined. However, productivity in manufacturing remains above other sectors, as only ¼ of workforce is able to produce nearly 40% of GDP while the other ¾ only a bit more than 60%. In sum, productivity in the manufacturing sector remains nearly the double of other sectors looking at recent figures.[1] Productivity is not a minor issue, as Krugman (1994) quoted: "Productivity isn't everything, but in the long run it is almost everything. A country's ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker."

Several countries are trying to shift from an agriculture-based economy to one in which services play a dominant role, which has already occurred in other parts of the globe. The effects of this structural transformation has been investigated not only for developed world (Desmet and Rossi-Hansberg, 2009 and Michaels, Rauch and Redding, 2012 for USA), but also in developing countries (Michaels, Rauch and Redding, 2012 for Brazil). Indeed, the share of services in value-added has increased in developing ESCAP economies since the 1990s by a quarter, accounting for more than 52% of total value-added. Nevertheless, despite this increase, it can be argued that countries that have developed successfully (including, for instance, the Republic of South Korea) have done so on the back of rapid industrialization. Moreover, McMillan and Rodrik (2011) argues that these specific Asian successes in productivity growth (especially compared to Africa and Latin America) resides on the fact that labor has shifted from low to high productive sectors, such as manufacturing. However, some Asian countries have not been successful and one reason could be that "services are not tradable to the same extent as manufactured goods, and for the most part do not exhibit the same technological dynamism, such that they are only a poor substitute to export-oriented industrialization" (Rodrik, 2015). In this view, it is thus imperative to strengthen the role of industry, in particular by increasing productivity in the sector.

At the same time, the Asia-Pacific region needs to shift to a more sustainable economic growth framework in which domestic and intra-regional demand act as the engines of growth, rather than relying primarily on export-led development. For this to happen, it will be important to reverse the declining share of labor income in output that has been observed in many countries as real wage growth has lagged productivity growth, which in turn has contributed to a widening of income inequality (Zhuang, Kanbur and Rhee, 2014).

Within the industrial sector, small and medium-sized enterprises (SMEs) form a critical component, contributing on average 38% of manufacturing value added in Asia between 2007 and 2012 and bringing in about 30% of total export value during this period. However, SMEs relevance varies substantially across countries, ranging from 28% of total employment in Kazakhstan to 97% in Indonesia (in 2012) [all figures from ADB (2013)]. Clearly, fostering SMEs, of which many are located in the informal sector, and ensuring that they become more productive is key for the sustainable development of the Asia-Pacific region.

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[1] In 2012, labor productivity in the manufacturing sector is estimated as 1.52 (38%/25%) while in other sectors, 0.83 (62%/75%).

Yet, SMEs face constraints in expanding activities and becoming more productive. Of these, access to finance, or lack of it, is critical: cross-country research points to substantial evidence that small firms face larger constraints and have less access to formal sources of external finance, which may be one of the factors holding back SMEs' contribution to economic growth (Beck and Demirguc-Kunt, 2006). Indeed, access to and cost of finance is often ranked as one of most constraining feature of the business environment faced by SMEs (Beck, 2007). Furthermore, the removal of credit constraints for investments in the manufacturing sector in developing countries has been proved relevant for development; see Lage de Sousa and Ottaviano (2014) for Brazil and Banerjee and Duflo (2014) for India. Addressing financial and institutional development is therefore critical to strengthening industry and unleashing SMEs' growth, thereby accelerating sustainable development in the Asia-Pacific region.

This paper shed some light on whether access to finance is the main obstacle for firms' productivity, not only its level but also its growth, in the Asia and Pacific region. Our results suggest that firms' productivity is strongly correlated with their access to finance, especially SMEs and particularly in the manufacturing sector.

In order to assess these issues, this paper has 5 Sections apart from this introduction. An explanation why SMEs should be the focus of this analysis is presented in Section 2. Data sources are described in Section 3, followed by some stylized facts obtained using the referred dataset. Section 5 investigates the links between productivity and access to finance by using an econometric approach. Section 6 analyzes some policies implemented for SME development. Last section presents our conclusions in the light of the recent literature.

II.   Why SMEs?

It is not new in the economic literature that limited access to credit hampers economic growth, especially long-term growth, as shown in Banerjee and Newman (1993) or Galor and Zeira (1993). Therefore, a business environment allowing firms to access credit for their investments creates favorable conditions for economic growth. In other words, credit is essential for development, see further discussion on this topic in Levine (2005).

SMEs are essential for economic growth as pointed out by Hallberg (2000): "SMEs are the emerging private sector in poor countries, and thus form the base for private sector-led growth". In fact, economic literature provides evidence of a positive association between economic growth and importance of SMEs. Using dataset from 45 countries, Beck, Demirguc-Kunt and Levine (2005) shows that participation of SMEs is strongly correlated to GDP per capita growth. For instance, they state that if Romania with a SME share of 37% had the same share as Denmark (69%), they would have grown 1.4% faster, which is substantially large considering that their sample average for GDP per capita growth was 1.5%. Although causality from SME share to economic growth is not confirmed by instrumental variable regressions in their paper, it is safe to infer that larger participation of SMEs and economic growth moves together in a country's economy. In a recent paper, Ayyagari, Demirguc-Kunt and Maksimovic (2014) investigates the contribution of small firms to employment, job creation and growth in developing countries. After investigating employment, sales and productivity growth, their results suggest that small firms generate the most new jobs, accounting for 45.34% of the jobs created. However, this performance is not accompanied by productivity growth, which is consistent with the previous result because

their productivity measure is sales per worker. In other words, their results show that small firms are able to grow their sales at the same speed as their number of employees. Moreover, large firms present higher productivity growth rate. One explanation is that while large firms are able to invest more due to access to finance, small firms are not. Therefore, large firms improve their productivity but small firms don't.

SMEs are more credit constrained compared to large firms both in developed and developing world as pointed out in Berger and Udell (1998) and Galindo and Schiantarelli (2003) as well in the literature review made by Beck and Demirguc-Kunt (2006). Moreover, Ayyagari, Demirguc-Kunt and Maksimovic (2008) investigated which obstacle are really impinging firms to grow. Looking at a diverse range of obstacles, from access to finance to provision of infrastructure, criminality, corruption and others, findings show that access to finance presents the most robust result compared to any other obstacle. In a study investigating the effects of financial, legal and corruptions problems on firms' growth rate, Beck, Demirguc-Kunt and Maksimovic et al (2005) found that finance obstacles effect on firms' annual growth is nearly twice of the same effect in a large firm. In sum, small firms do not only face higher financing obstacles but also are more affected by them.

Among the economic reasons to explain why SMEs face higher obstacle to finance their investments, two are worth mentioning as evidenced in Beck (2007): transactions costs; asymmetry information. First, evaluating a loan request requires entailing costs which is independent to its amount. Aside all other financing costs, this fixed initial transaction cost already inhibits SMEs to request a financial support as they are relative more expensive to them than for large firms. Thus, elevated transaction costs raise borrowing expenditures which eventually restrict access to external finance for SMEs. Second, two different sources of asymmetric information between borrowers and lenders (moral hazard; adverse selection) lead to higher default risk for SMEs.[2] Both economic reasons generate higher borrowing costs preventing less-risky SMEs to request financial support as they do not want to face this extra expenditure due to riskier SMEs.

In summary, we may argue that there are at least two reasons on why efforts to promote SMEs access to finance should be targeted, as suggested in Beck and Demirguc-Kunt (2006): (i) SMEs are the engine of economic development; (ii) market and institutional failures impede their growth, thus justifying government interventions.

III.   Data Description

In order to investigate how access to finance and other obstacles are associated to firms' productivity in the Asia and Pacific Region, we will utilize the World Bank Enterprise Survey (WBES). WBES collects information from companies in 135 countries worldwide through personal interviews with top managers or business owners. Firms are a representative sample of an economy's private sector and cover a wide range of business environment topics, such as access to finance, corruption, infrastructure, crime, competition and performance measures. Since 2005/06, these surveys used the same global methodology defined by the World Bank's Enterprise Analysis Unit. Therefore, WBES firm-level data has this particular advantage of being comparable across countries. Considering that the Asia and

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[2] Difficulties of choosing good credit risks ex-ante defines adverse selection and moral hazard refers to the incapacity of the lender to enforce the credit contract ex-post.

Pacific region comprehends a wide diversity of it member states, having a common survey's methodology for all selected counties is an asset. For the Asia and Pacific region, we have selected 23 countries. Selection was made in order to have a good representation of all sub-regions within the Asia and Pacific as well as the most recent data available in the WBES (see table 1).

Table 1. Recent data availability in WBES

ESCAP region	Countries	Years	Number of firms
North and Central Asia	Afghanistan	2008	535
		2014	410
	Armenia	2009	374
		2013	360
	Azerbaijan	2009	380
		2013	390
	Kyrgyzstan	2009	235
		2013	270
	Russia	2009	1,004
		2012	4,220
	Tajikistan	2008	360
		2013	359
South and Southwest Asia	Bangladesh	2007	1,504
		2013	1,442
	Bhutan	2009	250
		2015	253
	India	2014	9,281
	Nepal	2006	368
		2013	472
	Pakistan	2007	935
		2013	1247
	Sri Lanka	2011	610
	Turkey	2008	1,152
		2013	1,344
East and North-East Asia	China	2012	2,700
	Mongolia	2009	362
		2013	360
South-East Asia	Indonesia	2009	1444
	Laos	2009	360
		2012	270
	Myanmar	2014	632
	Philippines	2009	1,326
Pacific	Fiji	2009	164
	Micronesia	2009	68
	Samoa	2009	109
	Vanuatu	2009	128

This sample comprises nearly 34 thousand formal firms in these 23 countries surveyed over the period of 2007-2015. One shortcoming of this survey is that it cover only formal firms. However, literature has shown that although informal firms represent a large proportion of economic activity, especially in the developing world, economic development is basically driven by the performance of the formal sector, see La Porta and Shleifer (2008) for further discussion on this matter. As our interest is on productivity, we assume that investigating the issue on the formal sector is enough for our purpose. Although number of firms reproduces country sizes, such as Philippines having more than thousand firms while Vanuatu only 128, difference between countries persists. India has the larger dataset, being three times what was collected in China two years before. Although only 13 countries were surveyed twice, productivity growth is feasible to be measured for all countries. WBES provides information of firms' sales and number of employees not only in the surveyed year but also three years prior.

Aside the two targets measures, productivity and access to finance, other information are available, including other obstacles, such as informality, politics, criminality, corruption, taxes and infrastructure, as well as some firms' characteristics. In summary, WBES is a rich and cross-country comparable survey for assessing how some firms' characteristics might impact their performance and it has been used for a diverse range of investigations, including a recent paper evaluating which type of firm creates more jobs (Ayyagari, Demirguc-Kunt and Maksimovic, 2014).

IV. SMEs and Access to Finance in Asia and Pacific Region: Stylized Facts

A. Importance of SME and manufacturing

As mentioned in the introduction, importance of manufacturing in the Asia and Pacific region is reducing over time. Countries selected for this investigation follow the same pattern, see Table 2. Using the World Bank National Account Data, we are able to see that percentage of manufacturing in GDP of these countries reduced 2.17 p.p. from 2002 to 2013.[3] Worst decline is observed in Tajikistan (decline of 23.06 p.p.), but relevant countries, such as Russia, China and Indonesia, also experienced a shrink in their manufacturing sector. Among all ESCAP regions, South and Southwest Asia is where relevant countries, such as India and Bangladesh, have experienced an increase of manufacturing sector in their economies. Nevertheless, manufacturing share loss is occurring in all other parts of the globe with similar magnitude. In the world as whole, manufacturing declined 1.67 p.p. during the same period.

Considering their level, China is the most industrialized country among these selected countries, which average from 2002 to 2013 over 30%. Comparing to other countries classification, China remains above any other country classification group even high income countries. South-East Asia also presents higher levels of industrialization, because Indonesia and Philippines are the only other two countries with the importance of manufacturing over 20%. Despite their increase, Bangladesh and India remains having a share of manufacturing below 20% (17.27% in the former and 17.08% in the latter). Overall, unweighted average of

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[3] As there are no data available for high income countries and world in 2014, we considered the average and difference from 2002 to 2013 in order to have comparable figures from aggregated data. However, data from 2014 is available for most selected countries.

the share of manufacturing from 2002 to 2013 of these selected countries was below 15%, which is slightly lower than the world figure.

Table 2. Manufacturing share (from 2002 to 2014)

ESCAP region	Countries	2002	2013	Average 2002/13	Difference 2002/13
North and Central Asia	Afghanistan	18.75	12.03	15.77	-6.72
	Armenia	16.74	10.89	12.45	-5.84
	Azerbaijan	8.08	4.52	6.07	-3.56
	Kyrgyzstan	14.29	18.32	15.62	4.02
	Russia	17.08	15.10	16.45	-1.98
	Tajikistan	34.24	11.19	19.28	-23.06
South and Southwest Asia	Bangladesh	15.07	17.27	16.30	2.20
	Bhutan	7.66	8.79	8.27	1.13
	India	14.87	17.08	15.87	2.21
	Nepal	8.77	6.58	7.51	-2.19
	Pakistan	15.50	14.10	15.02	-1.41
	Sri Lanka	18.48	19.28	19.11	0.79
	Turkey	20.08	17.30	18.55	-2.77
East and North-East Asia	China	31.24	30.10	31.89	-1.14
	Mongolia	7.27	10.11	7.42	2.84
South-East Asia	Indonesia	28.72	20.98	25.62	-7.73
	Laos	8.96	8.22	8.55	-0.74
	Myanmar	9.18	N/A	10.18	N/A
	Philippines	24.69	20.41	22.61	-4.29
Pacific	Fiji	14.90	13.86	14.35	-1.05
	Micronesia	1.94	0.38	0.79	-1.56
	Samoa	N/A	N/A	N/A	N/A
	Vanuatu	4.76	3.61	4.14	-1.15
Unweighted average across countries		15.51	13.34	14.30	-2.17
High income		16.61	14.91	15.64	-1.71
Upper middle income		23.43	21.78	23.17	-1.65
Lower middle income		17.23	16.74	17.09	-0.49
Low income		11.43	8.95	10.30	-2.48
World		17.50	15.83	16.64	-1.67

Source: World Bank National Accounts Data.

* Myanmar from 2002 to 2004, Tajikistan from 2002 to 2013 and N/A means not available data.

Another focus of this paper is on firms' size. According to ADB (2013), SMEs accounted for 98% of all enterprises in Asia and employed 66% of the national labor force on average during 2007-2012. In monetary terms, they contributed to 38% of GDP or manufacturing value added and 30% of total export value in Asia on average in 2007-2012. These figures highlight the importance of SMEs in the Asia and Pacific region. In our selected sample, their relevance follows ADB (2013) findings as observed in Table 3.

Table 3. SMEs share in WBES

ESCAP region	Countries	Establishment	Employment	Revenue
North and Central Asia	Afghanistan	94.7%	95.3%	88.2%
	Armenia	87.9%	75.0%	92.6%
	Azerbaijan	91.1%	79.4%	87.6%
	Kyrgyzstan	84.9%	75.6%	31.6%
	Russia	81.5%	42.9%	38.3%
	Tajikistan	89.4%	80.9%	87.6%
South and Southwest Asia	Bangladesh	71.2%	16.2%	18.3%
	Bhutan	94.6%	89.7%	91.3%
	India	86.6%	60.1%	59.9%
	Nepal	98.2%	96.7%	95.6%
	Pakistan	89.1%	49.4%	74.0%
	Sri Lanka	94.1%	66.9%	69.8%
	Turkey	90.6%	59.4%	91.4%
East and North-East Asia	China	87.5%	37.2%	55.6%
	Mongolia	93.7%	88.3%	90.7%
South-East Asia	Indonesia	97.8%	72.7%	70.5%
	Laos	94.9%	81.6%	77.7%
	Myanmar	94.3%	75.6%	93.3%
	Philippines	87.0%	52.3%	47.2%
Pacific	Fiji	91.6%	78.3%	86.0%
	Micronesia	100.0%	100.0%	100.0%
	Samoa	95.4%	95.6%	99.6%
	Vanuatu	98.3%	99.8%	99.7%
Unweighted average across countries		91.1%	72.6%	75.9%

Source: World Bank Enterprise Survey (author's elaboration).

Overall, SMEs represent on average 91.1% of total establishments in these selected countries from the WBES.[4] Their participation in the sample ranges from 71.2% in Bangladesh to all firms in Micronesia. India and China are below the average yet with similar figures (86.6% and 87.5%, respectively). Indonesia also presents a higher participation of SMEs (97.8%). SMEs participation is also considerable in terms of employment and sales. Looking at the unweighted average, SMEs employs 72.6% of workers' force and generates 75.9% of sales in these economies.

Despite their relevance, SMEs loans made up to 1/4 of total banking lending in the Asia and Pacific region on average in 2012, as shown in ADB (2013). Their lower participation in the financial system indicates that these firms face credit restrictions to operate their business, which is the focus of our next sub-section.

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[4] WBES surveys firms in the Manufacturing and Services, therefore percentages represent SMEs' participation in these two broad sectors. Agriculture is not considered.

B.   Are SMEs more credit constrained?

Although international literature argues that SMEs are more credit constrained than large firms, it is important to verify if our selected sample corroborates this stylized fact. Table 2 shows how firms report access to finance as an obstacle to run their businesses in Asia and Pacific region according to their size. In general, firms in this region does not seem to perceive access to finance an obstacle, as less than 40% report that access to finance is a moderate, major or very severe obstacle. However, this perception is not homogeneous across firms' size. While 21.4% small firms report access to finance as major or very severe obstacle, only 14.1% of large firms finds the same.

Table 4. Percentage of firms in terms of how much an obstacle

All subregions	Small(<20)	Medium(20-99)	Large(100 and over)	Total
No obstacle	34.9%	34.9%	38.4%	35.7%
Minor obstacle	22.5%	26.4%	27.9%	25.2%
Moderate obstacle	21.1%	20.8%	19.6%	20.7%
Major obstacle	14.4%	12.1%	9.6%	12.5%
Very severe obstacle	7.0%	5.8%	4.5%	6.0%
Total	100%	100%	100%	100%

Source: WBES (author's elaboration).

Difference between firms on how they perceive access to finance has its roots. Looking at percentage of firms with banking account in the Asia and Pacific Region (see Table 3), it is feasible to observe that nearly one in five small firms do not have a banking account while less than 5% of large firms lack of banking account. In other words, for every large firm without a banking account in this region, there are four small firms in the same situation and two medium-size firms.

Table 5. Percentage of firms having a banking account

All subregions	Small(<20)	Medium(20-99)	Large(100 and over)	Total
No	18.7%	8.5%	4.6%	11.8%
Yes	81.3%	91.5%	95.4%	88.2%
Total	100%	100%	100%	100%

Source: WBES (author's elaboration).

As discussed in Section 2, moral hazard and adverse selection represent two explanations on why small firms are more credit constrained. In order to reduce the asymmetric information that might lead to these two shortcomings, firms certified their financial statements with external auditor. This involves costs and not all firms could afford this extra expenditure. As expected, percentage of firms having their financial statements certified by an external auditor increases with their size. For instance, nearly three quarters of larger firms in Asia and Pacific region tend to have their financial statements certified, yet 62.2% of small firms have not done it.

Table 6. Percentage of firms with their financial statements certified by external auditor

All subregions	Small(<20)	Medium(20-99)	Large(100 and over)	Total
No	62.2%	41.0%	25.1%	46.0%
Yes	37.8%	59.0%	74.9%	54.0%
Total	100%	100%	100%	100%

Source: WBES (author's elaboration).

One consequence of the disparities between firms according to their size in terms of access to finance is their ability to make investments. Therefore, small firms will tend to have lower investment rates compared to large firms, which is observed in firms from the Asia and Pacific Region (see Table 5). Again, percentage of firms investing increases with firms size, while only a quarter of small firms have bought capital in the last year, nearly 40% of medium-size firms and more than half of larger firms have done it.

Table 7. Percentage of firms which have invested in capital

All subregions	Small(<20)	Medium(20-99)	Large(100 and over)	Total
No	74.4%	60.8%	46.3%	63.0%
Yes	25.6%	39.2%	53.7%	37.0%
Total	100%	100%	100%	100%

Source: WBES (author's elaboration).

According to Abdulsaleh and Worthington (2013), small firms tend to use more their own funds to make their investments compared to large firms. In the case of the Asia and Pacific region, 56.3% of firms which have bought capital in the previous year have fully funded this acquisition with their own funds. Although, percentage of SMEs is superior to large firms (60.9% and 57% compared to 51.7%), differences are not dramatic as the acquisition per se. Despite having better access to finance and reporting it as not an obstacle, firms in this region remains financing their investments substantially with their resources.

Table 8. Percentage of firms in terms of full funding their acquisition of capital

All subregions	Small(<20)	Medium(20-99)	Large(100 and over)	Total
No	39.1%	43.0%	48.3%	43.7%
Yes	60.9%	57.0%	51.7%	56.3%
Total	100%	100%	100%	100%

Source: WBES (author's elaboration).

C. Correlation between access to finance and productivity

Assessment shifts to evaluate whether this credit constraints faced by firms in this regions is related to their performance. As observed, most of the differences between SMEs and large firms occur for those reporting moderate to no obstacle compared to major and very severe. Therefore, we have classified all firms between credit constrained (moderate, major or very

severe) and not constrained (no obstacle or minor). Our aim is now to compare the productivity between these two groups. Table 7 shows the difference in terms of productivity, not only labor productivity level but also Total Factor Productivity (TFP) and labor productivity growth, between these two groups.[5]

Table 9. Differences between constrained and non-constrained firms

Finance groups	Labor productivity	TFP	Prod. growth
Not constrained (NC)	9.77	0.08	6.4%
Constrained (C)	9.49	-0.02	5.9%
Total	9.66	0.04	6.2%
Difference (NC-C)	0.28	0.10	0.5%
P-value (different from 0)	0%	0%	31.16%

On one hand, it is feasible to observe that constrained firms show lower productivity levels not only in terms of labor productivity but also in TFP. This evidence suggests that firms facing higher obstacles to access to finance are those less productive. On the other hand, firms not financially constrained exhibit a productivity growth higher than those constrained, but difference is not statistically different from zero. Therefore, it is not possible to infer that firms experiencing higher finance obstacles are increasing their productivity distinctly from firms with lower barriers to access finance. Summing up, firms with higher finance constraints show lower levels of productivity yet they did not perform overtime differently from those not constrained. These findings suggest that finance obstacles might be impinging the achievement of higher productivity levels of constrained firms, such as SMEs. Table 8 compares productivity levels and growth distinguishing firms according to their size.

Table 10. Differences between constrained and non-constrained firms by size

Finance groups	Size	Labor productivity	TFP	Prod. growth
Not constrained (NC)	SME	9.71	0.04	6.4%
	Large	9.98	0.18	6.4%
	All	9.77	0.08	6.4%
Constrained (C)	SME	9.42	-0.05	6.1%
	Large	9.78	0.07	5.3%
	All	9.49	-0.02	5.9%
Total	SME	9.59	0.00	6.3%
	Large	9.91	0.14	6.0%
	All	9.66	0.04	6.2%

As observed, SMEs are less productive compared to large firms yet their performance overtime is similar to its counterpart.[6] Similar pattern is encountered when comparing SMEs and large firms regardless how they perceived finance as an obstacle. The only difference

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[5] Labor productivity and TFP are in logs. TFP estimation strategy and results are presented in the appendix 7.1.
[6] Although not reported, testing whether averages are different show that levels are distinct yet growth not.

seems to occur in large firms as those constrained are growing more than 1% lower than those not constrained. However, when testing whether these averages are different, we are not able to reject the hypothesis that they are equal. As a result, these preliminary outcomes suggest that gap between constrained and non-constrained firms occurs in large firms as well as SMEs in terms of productivity level yet not their growth. While gap in labor productivity is wider for SMEs, it is the inverse regarding TFP. Therefore, it is not conclusive whether SMEs suffers more from access to finance than large firms.

Another avenue explored in this paper resides on how different industries might be affected by their accessibility of finance. Table 9 presents how productivity differs in terms of their financial constraints and between manufacturing and services.

Table 11. Differences between constrained and non-constrained firms by industry

Finance groups	Size	Labor productivity	TFP	Prod. growth
Not constrained (NC)	Manufacturing	9.75	0.08	7.1%
	Services	9.82	0.09	4.9%
	All	9.77	0.08	6.4%
Constrained (C)	Manufacturing	9.40	-0.03	6.5%
	Services	9.68	0.20	4.7%
	All	9.49	-0.02	5.9%
Total	Manufacturing	9.61	0.04	6.9%
	Services	9.76	0.13	4.8%
	All	9.66	0.04	6.2%

Overall, manufacturing firms show a lower productivity level yet higher performance overtime, as all differences between manufacturing and services are statistically different from zero.[7] Looking at constrained versus not constrained, Services' firms are less productive in terms of labor productivity yet more in terms of TFP, while differences in productivity growth is practically zero. Thus, there is not a reasonable conclusion that can be reached regarding Services. As for manufacturing, it is clear that constrained firms present lower levels and growth of productivity compared to those not constrained. It is safe to infer that manufacturing firms seems to be most affected by access to finance than firms in Services, as their performance seems to be strongly correlated to how they perceive access to finance as an obstacle. However, all these preliminary evidence should be corroborated by the scrutiny of an econometric approach.

VI.   The Link between Productivity and Finance: Econometric Approach

In previous sections, we were able to see that access to finance seems to be associated to productivity, either at their level or their growth (actually more to the former than the latter). However, other factors might be also associated to productivity, including other obstacles. It

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[7] Labor productivity and productivity growth at 1% and TFP, at 10%. All statistics are not reported in the table but are available upon request.

is important to investigate whether this association remains significant after controlling for other factors. This section explores the link between productivity, access to finance and these other factors. Three measures of productivity are investigated in this section: labor productivity in US dollars; total factor productivity (TFP); and labor productivity growth in terms of local currency. The first measure is constructed in order to have comparable labor productivity across countries. As mentioned in Section 3, TFP is estimated at country level using local currencies values for capital and sales. Labor productivity growth is measured at local currency, because sales values reported by enterprises in the survey are extremely comparable to actual values. Therefore, we assume that lagged reported values are consistent with actual values.[8]

As mentioned in Section 2, Ayyagari et al (2008) explored which obstacle was impinging on firms' performance, measured by sales and employment growth. We will adapt their methodology to our investigation, because we believe that other factors are important for productivity and perhaps not for sales and employment growth. In their original paper evaluating which obstacle was more influential to firms' growth, they have used only firm size and country-fixed effects as controls. However, Ayyagari et al (2014) argues that age and industry dummies are also important factors to explain firms' performance. Nevertheless, two other characteristics are associated to productivity: exporter status; multinational status. Thus, our econometric specification is:

$$(\text{Productivity Measure})_i = a + b_1 \log(size)_i + b_2 \log(age)_i + b_3 Multinational_i + b_4 Exporter_i + b_{5j} Obstacle_{ij} + b_6 \text{ Industry Dummies}_i + b_7 \text{ Year Dummies}_i + b_8 \text{ Country Dummies}_i + e_i \qquad (1)$$

For our both level productivity measures (labor productivity and TFP) for each firm i, we take their logs. As productivity growth takes not only zero value but also negative values, we have not taken its log. Nevertheless, some outliers appears in terms of productivity growth. In order to eliminate these outliers, we restricted our analysis to only those able to improve their productivity by doubling it in three years.[9] Our main interest is on parameters multiplying the obstacles, which are: Finance; Political; Crime; Taxes; Corruption; Informal Sector; and Infrastructure. For all these aspects, firms are asked how these issues constitute as an obstacle for their operations. Their assessment on these issues follows what we have observed in Section 3, ranging from no obstacles (assuming value 0) to very severe obstacle (value 4).[10]

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[8] Other papers using WBES, such as Ayyagari et al (2014), measure growth by utilizing local currency as we do.
[9] Other thresholds have been also tested, such as tripling their productivity, but results remain qualitatively similar.
[10] For some indicators, we have used an average of the available information. For infrastructure, we use the mean of electricity and telecommunications and for taxes, we use how their rate, administrations and business licensing and permits are considered as obstacle.

Table 12. Obstacles to labor productivity level (USD)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	All surveys				Only most recent surveys			
VARIABLES	All firms	Small	Medium	Large	All firms	Small	Medium	Large
Log(Size)	0.0457***	0.1280***	0.1568***	-0.0660**	0.0479***	0.1229***		-0.0652**
							0.1630***	
	(0.008)	(0.037)	(0.032)	(0.026)	(0.008)	(0.038)	(0.032)	(0.026)
Log(Age)	0.0334**	0.0297	0.0203	0.0853**	0.0339**	0.0369	0.0198	0.0798**
	(0.017)	(0.026)	(0.027)	(0.036)	(0.017)	(0.026)	(0.027)	(0.036)
Multinational	0.2250***	0.2100	0.4425***	0.1567	0.2267**	0.1391	0.5000***	0.1504
	(0.082)	(0.134)	(0.132)	(0.145)	(0.091)	(0.165)	(0.140)	(0.149)
Exporter	0.3237***	0.2345***	0.3353***	0.3155***	0.3242***	0.1979**	0.3467***	0.3257***
	(0.029)	(0.075)	(0.044)	(0.050)	(0.030)	(0.078)	(0.044)	(0.051)
Finance	-0.0487***	-0.0642***	-0.0506***	0.0044	-0.0431***	-0.0566***	-0.0479***	0.0061
	(0.009)	(0.012)	(0.015)	(0.020)	(0.009)	(0.013)	(0.015)	(0.021)
Political	0.0212**	0.0205	0.0022	0.0537**	0.0202**	0.0220	-0.0031	0.0562**
	(0.010)	(0.014)	(0.015)	(0.025)	(0.010)	(0.015)	(0.015)	(0.025)
Crime	-0.0091	-0.0008	-0.0097	-0.0386	-0.0172	-0.0003	-0.0220	-0.0548*
	(0.011)	(0.016)	(0.019)	(0.028)	(0.012)	(0.018)	(0.019)	(0.028)
Taxes	0.0265**	0.0324*	0.0118	0.0064	0.0293**	0.0302	0.0180	0.0086
	(0.013)	(0.019)	(0.020)	(0.030)	(0.013)	(0.020)	(0.020)	(0.031)
Corruption	0.0154*	0.0304**	0.0106	-0.0024	0.0150	0.0283**	0.0131	-0.0017
	(0.009)	(0.013)	(0.014)	(0.021)	(0.009)	(0.014)	(0.015)	(0.021)
Informal Sector	-0.0223***	0.0000	-0.0257*	-0.0499**	-0.0240***	0.0042	-0.0310**	-0.0502**
	(0.009)	(0.013)	(0.014)	(0.021)	(0.009)	(0.014)	(0.014)	(0.022)
Infrastructure	0.0272**	0.0310*	0.0315*	0.0146	0.0234*	0.0179	0.0352*	0.0194
	(0.012)	(0.018)	(0.018)	(0.028)	(0.012)	(0.018)	(0.019)	(0.029)
Constant	9.6951***	8.6485***	6.2139***	10.8340***	5.9462***	8.2435***	5.8376***	7.6485***
	(0.669)	(0.246)	(0.198)	(0.463)	(0.164)	(0.234)	(0.232)	(0.657)
Country Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	20,572	7,751	8,140	4,681	19,320	7,001	7,764	4,555
R-squared	0.2206	0.2788	0.2026	0.2153	0.2172	0.2819	0.1976	0.2157

Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

Different strategies to estimate (1) using survey data are available, however we make use of the "model approach" (see Cameron and Trivedi, 2005) used in the literature which utilizes data collected in the sample directly, without weighting.[11] Table 7 shows the result using labor productivity in US dollars.[12] As some countries were surveyed twice, we have

[11] This approach is also utilized by Ayyagari et al (2014) and Ayyagari et al (2008).

[12] Similar results are obtained using labor productivity in local currency, see Table A.1 in the appendix.

considered two different groups of observations for robust results: considering all surveys available (columns 1 to 4); only the most recent surveys (columns 5 to 8). Each group shows four columns, being one taking into account all firms and the other three restricting the sample into firms' size classification (small, medium and large). The objective is to shed some light on whether results differ according to firms' size. Before analyzing the results, number of observations are relatively similar between the two groups, because only a small fraction of firms were surveyed in both years in each country. For example, solely 160 firms in Bangladesh were surveyed in both years (2007 and 2013).

Overall, we observe that productivity increases with firms' size and age as well as by their export and multinational status. Therefore, it is safe to infer that as firms develop (either increasing their size or remains competitive in the market), they are able to achieve higher levels of productivity. In terms of obstacles, our outcomes back up previous research showing that access to finance is negatively related to firms' performance, but now with productivity level and not firms' growth from previous papers. In Ayyagari et al (2008), among all obstacles investigated, only three appeared negatively correlated with firms' revenue and labor growth: access to finance, crime and policy instability.[13] However, robust results are obtained only with access to finance in their investigation. In this paper, political factors seem to be positively related to firms' productivity, especially large firms.[14] This result is contra-intuitive as it seems that higher political obstacles faced by firms leads to more productive ones. Therefore, these results should be corroborated in the next tables to in order to be valid. As for crime, outcomes suggest that firms do not matter for productivity level. Regarding access to finance, only SMEs are able to show that access to finance is negatively correlated to their productivity, because parameter estimated for large firms is non-significant. These results suggest that SMEs in the Asia and Pacific region face higher credit restriction to improve their productivity.

Labor productivity assumes that firms do not have capital and workers are the only production factor to distinguish them. However, it is a common sense that firms use also capital for their production processes. Not considering capital as a production factor leads to an imperfect measure of productivity. It is essential to evaluate how productivity considering capital, named as TFP, is associated to these investigated obstacles and controls. Table 8 shows results for TFP following the same structure used in Table 7, not only in terms of which survey is considered but also firms' size.

First impression consists of a dramatic reduction of the sample due to the inexistence of reported capital measures in the surveys, as our investigation is restricted only less than 9 thousand firms. Despite the limited number of observations, results remain similar to labor productivity. Export and multinational status as well as size remains positively associated with productivity, but age becomes non-significant. This means that while remaining in the market might be able to be associated with larger levels of labor productivity, it seems that this result can be explained by acquisition of capital over time which does not translate in effective increase of productivity, per se. In other words, firms accumulate capital over time yet productivity remains stagnated.

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[13] In their paper, some obstacles are different from our paper.

[14] Other obstacles, such as taxes, infrastructure and corruption, also present a positive correlation.

Table 13. Obstacles to total factor productivity

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	All surveys				Only most recent surveys			
	All firms	Small	Medium	Large	All firms	Small	Medium	Large
Log(Size)	0.0216**	-0.0396	0.0680*	-0.0993***	0.0221**	-0.0472	0.0669	-0.0965***
	(0.011)	(0.063)	(0.041)	(0.031)	(0.011)	(0.064)	(0.041)	(0.031)
Log(Age)	-0.0195	-0.0490	-0.0299	0.0501	-0.0198	-0.0469	-0.0313	0.0498
	(0.022)	(0.037)	(0.035)	(0.043)	(0.022)	(0.037)	(0.035)	(0.043)
Multinational	0.1752**	-0.0059	0.4286***	0.0834	0.1732**	-0.0114	0.4281***	0.0801
	(0.088)	(0.228)	(0.149)	(0.120)	(0.088)	(0.228)	(0.149)	(0.120)
Exporter	0.2678***	0.3128***	0.3397***	0.1857***	0.2718***	0.3202***	0.3399***	0.1935***
	(0.035)	(0.113)	(0.050)	(0.055)	(0.035)	(0.114)	(0.050)	(0.055)
Finance	-0.0629***	-0.0566***	-0.0770***	-0.0651***	-0.0615***	-0.0554***	-0.0772***	-0.0625**
	(0.012)	(0.019)	(0.020)	(0.025)	(0.012)	(0.019)	(0.020)	(0.025)
Political	-0.0152	-0.0112	-0.0219	-0.0200	-0.0152	-0.0093	-0.0219	-0.0228
	(0.014)	(0.024)	(0.020)	(0.031)	(0.014)	(0.024)	(0.020)	(0.031)
Crime	-0.0163	0.0701**	-0.0434*	-0.0685*	-0.0249	0.0581**	-0.0465*	-0.0793**
	(0.016)	(0.028)	(0.024)	(0.035)	(0.016)	(0.028)	(0.024)	(0.035)
Taxes	-0.0030	-0.0141	0.0163	0.0009	-0.0024	-0.0116	0.0164	-0.0003
	(0.017)	(0.029)	(0.026)	(0.035)	(0.017)	(0.030)	(0.026)	(0.035)
Corruption	0.0233*	0.0104	0.0219	0.0388	0.0274**	0.0161	0.0237	0.0450*
	(0.013)	(0.022)	(0.019)	(0.027)	(0.013)	(0.022)	(0.019)	(0.027)
Informal Sector	0.0020	0.0339	-0.0104	-0.0243	0.0029	0.0359*	-0.0104	-0.0244
	(0.012)	(0.021)	(0.018)	(0.027)	(0.012)	(0.021)	(0.018)	(0.027)
Infrastructure	0.0659***	0.0228	0.0564**	0.1153***	0.0649***	0.0206	0.0563**	0.1160***
	(0.017)	(0.030)	(0.025)	(0.034)	(0.017)	(0.030)	(0.025)	(0.034)
Constant	0.2625	0.5206	-0.0021	0.6765	-0.5551*	-0.7170	-0.4656	0.2699
	(0.244)	(0.356)	(0.327)	(0.961)	(0.328)	(0.613)	(0.459)	(0.237)
Country Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,989	2,502	3,896	2,591	8,941	2,477	3,879	2,585
R-squared	0.0547	0.0519	0.0727	0.0851	0.0553	0.0500	0.0732	0.0855

Robust standard errors in parentheses.

*** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Positive association between political factors and productivity vanishes, which means that previous results lack of corroboration with other measures of productivity, such as TFP. Although crime shows some non-significant and mixed results depending on different firms' size, it is not associated to TFP when using all firms together. Thus, this suggests that criminality might not be a relevant factor to explain productivity level. In contrast to previous results from Ayyagari et al (2008), infrastructure obstacles appear to be positively correlated to firms' productivity, which was insignificant for firms' growth. As it is not corroborated by previous papers as well as it seems contra-intuitive, this result needs further investigation on which type of infrastructure can be leading to this unexpected outcome.

Despite these results in controls and other obstacles, access to finance remains as the only obstacle to show the expected sign: negative. Nevertheless, large firms' productivity becomes negatively associated to how firms perceive it as an obstacle, which is different from what we found with labor productivity. Now, the more firms are credit constrained, the lower is their productivity, regardless their size. This results not only back up previous findings in the literature (such as in Ayyagari et al 2008) but also results obtained with labor productivity for SMEs in Table 7.

Table 14. Obstacles to productivity growth

VARIABLES	(1) All firms	(2) Small	(3) Medium	(4) Large	(5) All Firms	(6) Small	(7) Medium	(8) Large
		All surveys				Only most recent surveys		
Log(Size)	-0.0053**	-0.0309***	0.0012	-0.0043	-0.0049**	-0.0356***	0.0026	-0.0036
	(0.002)	(0.012)	(0.009)	(0.006)	(0.002)	(0.012)	(0.008)	(0.006)
Log(Age)	0.0048	0.0139*	-0.0017	-0.0001	0.0029	0.0121	-0.0042	0.0002
	(0.005)	(0.008)	(0.007)	(0.009)	(0.005)	(0.008)	(0.007)	(0.009)
Multinational	0.0255	0.0251	0.0672**	-0.0089	0.0278	0.0418	0.0656**	-0.0074
	(0.020)	(0.055)	(0.029)	(0.030)	(0.021)	(0.062)	(0.030)	(0.031)
Exporter	0.0093	0.0159	0.0069	0.0109	0.0086	0.0053	0.0113	0.0075
	(0.007)	(0.021)	(0.011)	(0.011)	(0.007)	(0.021)	(0.011)	(0.011)
Finance	-0.0071***	-0.0109**	-0.0023	-0.0087	-0.0086***	-0.0148***	-0.0022	-0.0085
	(0.003)	(0.004)	(0.004)	(0.006)	(0.003)	(0.004)	(0.004)	(0.006)
Political	0.0040	-0.0002	0.0086**	0.0024	0.0048*	0.0014	0.0081*	0.0033
	(0.003)	(0.005)	(0.004)	(0.006)	(0.003)	(0.005)	(0.004)	(0.006)
Crime	0.0074**	0.0102*	0.0068	0.0038	0.0073**	0.0099*	0.0082	0.0015
	(0.003)	(0.006)	(0.005)	(0.007)	(0.003)	(0.006)	(0.005)	(0.007)
Taxes	0.0035	0.0111*	0.0004	-0.0047	0.0028	0.0119*	-0.0021	-0.0029
	(0.004)	(0.007)	(0.006)	(0.007)	(0.004)	(0.007)	(0.005)	(0.007)
Corruption	-0.0027	-0.0092**	-0.0022	0.0075	-0.0045*	-0.0121***	-0.0026	0.0048
	(0.003)	(0.005)	(0.004)	(0.005)	(0.003)	(0.005)	(0.004)	(0.005)
Informal Sector	0.0032	0.0045	0.0022	0.0047	0.0041*	0.0068	0.0022	0.0039
	(0.002)	(0.004)	(0.004)	(0.005)	(0.002)	(0.004)	(0.004)	(0.005)
Infrastructure	-0.0018	0.0012	-0.0015	-0.0091	-0.0024	-0.0007	-0.0020	-0.0085
	(0.004)	(0.006)	(0.005)	(0.007)	(0.004)	(0.006)	(0.005)	(0.007)
Constant	0.5330***	-0.2145***	-0.5694***	0.6815***	-0.4863***	-0.1563	-0.4905***	-0.0101
	(0.062)	(0.070)	(0.100)	(0.158)	(0.063)	(0.102)	(0.102)	(0.142)
Country Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	16,732	5,933	6,806	3,993	16,046	5,520	6,605	3,921
R-squared	0.0299	0.0387	0.0359	0.0466	0.0235	0.0306	0.0336	0.0343

Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1.

So far, we focused our analysis in firms' productivity level, but it is advisable to investigate it in their growth as well. Outcomes assessing the link between productivity growth and its obstacles and controls are presented in Table 9. Results change significantly in terms of controls, since now only firms' size is associated with productivity growth, but with an

inverted sign (being now negative). This means that labor productivity growth is associated with smaller firms, which is consistent with our measure of productivity (sales per worker).

As for obstacles, political factors show some positive association with productivity growth yet not consistent across different surveys. Crime appears to be positively associated to productivity growth which is a contrary result compared to what was observed in Ayyagari et al (2008). Outcomes with other obstacles presented with productivity level practically disappear with productivity growth such as from infrastructure.

Once more, results regarding access to finance remains as the main obstacle hampering firms to develop, since it is the only obstacle showing a negative sign. Furthermore, this association remains only for small firms, being non-significant for medium and large firms. This confirms the idea that credit restriction limit firms' development through productivity growth. These outcomes suggest that lessening credit restriction for small firms might definitely enable them to become more competitive.

As discussed earlier, manufacturing differs from non-manufacturing in terms of productivity and our stylized facts showed some evidence that credit restriction might be affecting manufacturing firms more intensively. In order to assess whether our results differ in terms of sector classification, Table 15 shows results for manufacturing and non-manufacturing sectors for labor productivity.[15]

Again, results remain similar to previous analysis in terms of control, only age becoming non-significant for manufacturing and size for non-manufacturing. In terms of obstacles, all of them remain showing non-significant results or unexpected signs, which might be interpreted as different levels of obstacles that firms faces. For instance, large firms might respond the questionnaire considering infrastructure of the country as whole while SMEs might refer only to where they are located.

Among all obstacles investigated, access to finance remains showing the expected sign for both sector classifications considered. Moreover, this negative association is concentrated in SMEs as it is non-significant for large firms regardless which sector is. Looking at the main result (columns 1 and 5), it seems that credit constraints are negatively associated with manufacturing and non-manufacturing at similar magnitude. However, when comparing SMEs, manufacturing firms appears to be more affected than non-manufacturing. Looking at the standard deviation, it is not feasible to infer that because there is an intersection in the confidence interval between manufacturing and non-manufacturing sector's parameter for finance.

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[15] Only few firms in the non-manufacturing sector report their capital stock, thus we limited our analysis to labor productivity.

Table 15. Obstacles to labor productivity level: manufacturing versus non-manufacturing (USD)

VARIABLES	(1) Manufacturing	(2)	(3)	(4)	(5) Non-manufacturing	(6)	(7)	(8)
	All firms	Small	Medium	Large	All firms	Small	Medium	Large
Log(Size)	0.0718***	0.0610	0.1237***	-0.0545*	0.0129	0.1267**	0.2498***	-0.1144*
	(0.010)	(0.051)	(0.038)	(0.028)	(0.015)	(0.053)	(0.059)	(0.062)
Log(Age)	-0.0301	-0.0696**	-0.0260	0.0403	0.1579***	0.1330***	0.1403**	0.2147**
	(0.019)	(0.032)	(0.031)	(0.040)	(0.031)	(0.043)	(0.057)	(0.088)
Multinational	0.2074*	-0.0212	0.5609***	0.0732	0.2958***	0.2682	0.2152	0.4137*
	(0.114)	(0.228)	(0.161)	(0.174)	(0.115)	(0.166)	(0.228)	(0.225)
Exporter	0.3466***	0.3519***	0.3670***	0.3188***	0.2300***	0.1281	0.2305**	0.3877***
	(0.033)	(0.095)	(0.048)	(0.053)	(0.073)	(0.129)	(0.107)	(0.149)
Finance	-0.0444***	-0.0657***	-0.0524***	0.0074	-0.0478***	-0.0447**	-0.0466*	-0.0048
	(0.011)	(0.016)	(0.017)	(0.023)	(0.015)	(0.019)	(0.028)	(0.046)
Political	0.0161	-0.0001	0.0043	0.0497*	0.0289*	0.0352*	0.0023	0.0901*
	(0.012)	(0.019)	(0.017)	(0.028)	(0.016)	(0.021)	(0.027)	(0.049)
Crime	-0.0246	0.0239	-0.0356	-0.0585*	0.0230	-0.0068	0.0483	-0.0066
	(0.015)	(0.023)	(0.024)	(0.032)	(0.018)	(0.023)	(0.032)	(0.056)
Taxes	0.0130	0.0191	-0.0029	-0.0126	0.0453**	0.0370	0.0319	0.0472
	(0.016)	(0.025)	(0.023)	(0.034)	(0.022)	(0.030)	(0.036)	(0.061)
Corruption	0.0126	0.0282	0.0221	-0.0074	-0.0057	0.0192	-0.0265	-0.0850**
	(0.011)	(0.018)	(0.017)	(0.023)	(0.015)	(0.020)	(0.026)	(0.043)
Informal Sector	-0.0072	0.0378**	-0.0201	-0.0439*	-0.0267*	-0.0229	-0.0237	-0.0431
	(0.011)	(0.017)	(0.016)	(0.025)	(0.014)	(0.019)	(0.026)	(0.043)
Infrastructure	0.0555***	0.0017	0.0689***	0.1113***	-0.0241	0.0384	-0.0478	-0.2294***
	(0.015)	(0.025)	(0.023)	(0.031)	(0.019)	(0.025)	(0.032)	(0.058)
Constant	8.7821***	9.0267***	8.6496***	8.4922***	9.7856***	8.4662***	5.6370***	11.5854***
	(0.191)	(0.270)	(0.299)	(0.901)	(0.705)	(0.302)	(0.302)	(0.625)
Country Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,185	3,899	5,651	3,635	7,387	3,852	2,489	1,046
R-squared	0.2064	0.2505	0.1871	0.2256	0.2728	0.3189	0.2608	0.2805

Robust standard errors in parentheses.

*** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Last, but not least, it is also relevant to explore how productivity growth from manufacturing and non-manufacturing firms might be associated to these obstacles. Outcomes splitting our sample into these two groups are available in Table 16. Discrepancies occur in this case since finance is only negatively related to productivity growth in manufacturing sector. This means that when considering productivity growth, credit constraints hamper manufacturing firms to improve their performance. As this evidence does not occur in non-manufacturing sector, we may infer that access to credit affects more the most productive sector. Additionally, this negative association is only observed when looking at small firms, which confirms the idea that small firms in the manufacturing sector are those mostly impacted by facing higher obstacles to finance their investments.

Table 16. Obstacles to productivity growth - manufacturing versus non-manufacturing

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Manufacturing				Non-manufacturing		
	All firms	Small	Medium	Large	All firms	Small	Medium	Large
Log(Size)	-0.0026	-0.0307**	0.0082	0.0080	-0.0118***	-0.0281	-0.0164	-0.0448***
	(0.002)	(0.016)	(0.010)	(0.006)	(0.004)	(0.018)	(0.018)	(0.012)
Log(Age)	-0.0021	0.0104	-0.0116	-0.0034	0.0192**	0.0197	0.0257	-0.0031
	(0.005)	(0.010)	(0.008)	(0.010)	(0.009)	(0.014)	(0.016)	(0.019)
Multinational	0.0465**	0.1701**	0.0659*	0.0166	-0.0154	-0.0632	0.0710	-0.1195
	(0.023)	(0.071)	(0.036)	(0.033)	(0.040)	(0.073)	(0.053)	(0.083)
Exporter	0.0074	0.0015	0.0136	0.0050	0.0116	0.0374	-0.0227	0.0302
	(0.008)	(0.025)	(0.012)	(0.012)	(0.020)	(0.038)	(0.029)	(0.040)
Finance	-0.0078**	-0.0240***	0.0038	-0.0054	-0.0053	0.0028	-0.0176**	-0.0158
	(0.003)	(0.006)	(0.005)	(0.006)	(0.005)	(0.007)	(0.009)	(0.012)
Political	0.0086***	0.0128**	0.0075	0.0060	-0.0055	-0.0146*	0.0123	-0.0165
	(0.003)	(0.006)	(0.005)	(0.006)	(0.005)	(0.008)	(0.009)	(0.014)
Crime	0.0097**	0.0121	0.0144**	-0.0030	0.0039	0.0066	-0.0054	0.0164
	(0.004)	(0.008)	(0.006)	(0.008)	(0.006)	(0.008)	(0.010)	(0.016)
Taxes	0.0030	0.0156*	-0.0043	0.0012	0.0006	0.0020	0.0086	-0.0265
	(0.004)	(0.008)	(0.006)	(0.008)	(0.007)	(0.010)	(0.011)	(0.017)
Corruption	-0.0015	-0.0061	-0.0003	0.0040	-0.0059	-0.0124*	-0.0055	0.0141
	(0.003)	(0.006)	(0.005)	(0.006)	(0.005)	(0.007)	(0.008)	(0.013)
Informal Sector	0.0043	0.0066	0.0022	0.0041	0.0019	0.0011	0.0027	0.0124
	(0.003)	(0.006)	(0.004)	(0.006)	(0.004)	(0.007)	(0.007)	(0.011)
Infrastructure	-0.0021	-0.0011	-0.0039	-0.0028	0.0005	0.0069	0.0021	-0.0307*
	(0.004)	(0.008)	(0.006)	(0.008)	(0.006)	(0.009)	(0.010)	(0.016)
Constant	-0.2419**	-0.1343	-0.2964*	-0.5289***	0.5651***	-0.1586*	-0.4704***	1.1848***
	(0.102)	(0.148)	(0.169)	(0.173)	(0.080)	(0.090)	(0.136)	(0.205)
Country Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,173	3,178	4,865	3,130	5,559	2,755	1,941	863
R-squared	0.0286	0.0435	0.0354	0.0404	0.0359	0.0493	0.0479	0.1283

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

VII.   Policies for SME Financial Inclusion

Our results back up the idea that access to finance is a key factor for SME development, which was not neglected by police makers in the region, as evidenced by ADB (2013). According to the publication, financing SMEs requires different types of solutions to adequate firms' needs in their distinct stages of development. In other words, innovative and diversified financing models should be implemented to foster SMEs development. Based on this background, different policies have been developed in Asia and Pacific countries to promote better access to finance for SMEs, yet focus has been given to bankability and little emphasis to nonbank finance, such as capital market. As shown in ADB (2013), examples of these policies are: public credit guarantee schemes in Indonesia; portfolio guarantee schemes

in Thailand; mandatory lending in the Philippines; refinancing schemes in Bangladesh and Malaysia; and the establishment of a centralized credit bureau in Viet Nam. Our aim now is to provide an analysis on some policies implemented for SME development in the region based on what is described in the ADB (2013) as well as an example from South America.[16]

In the Asia and Pacific region, there are two levels of SME access to bank lending: high accessibility, in which SME share in total loan provision stands around 30% to 40%, such as China, Solomon Islands and Thailand; low accessibility, in which SME credit is less than 20% of total loan provision, such as in Indonesia, Kazakhstan and Malaysia. One of the banking policies to improve the bankability of SMEs is setting annual credit volume targets for lending to SMEs. In India and Bangladesh, banks are advised to achieve a 20% year-on-year growth of credit provision to Micro and Small Enterprises (MSE). Philippine banks are obliged to allocate 8% of their loans provisions to MSEs and other 2% to medium-sized enterprises. Sri Lanka Central Bank has set a maximum credit exposure level of banks to SMEs in order to secure a healthy risk management of the banking sector. Although their goals aim to provide access to finance to those more credit constrained firms, these policies might hamper the development of the banking system and consequently economic development as a whole. Creating lower or upper bound for credit exposure to SME from private banking system in these countries interferes in the functioning of the market. In other words, banks might reject good clients in order to meet government targets. In the case of India, Bangladesh and Philippines, larger firms might have their loans denied so that private banks are able to respond to government regulations, while in Sri Lanka same could happen to SMEs just because they asked last. In spite of setting limits, another more effective approach could be establishing incentives to banks to provide loans to SMEs, such as reduced taxes for revenues generated from financial support given to SMEs. This type of policy does no distort the market functioning and may increase SME access to finance.

Another popular policy established in the Asia and Pacific Region is the provision of credit guarantee schemes. As they cover a part of the credit assigned to SME, they mitigate risks associated to these loans. For instance, India launched the Credit Guarantee Fund Scheme for MSEs in 2000 as a partial guarantee scheme covering 75% of the credit applied. People's Business Credit is a public credit guarantee scheme established by Indonesian government in 2007, in order to guarantee 70%-80% of credit applied. Solomon Islands Central Bank created the Small Business Finance Scheme to provide credit guarantee schemes for SMEs, which would cover 90% of credit applied. Damu Entrepreneurship Development Fund from Kazakhstan is a partial credit guarantee scheme for SME covering up to 70% of credit applied. As observed, credit guarantee is widely used in the region and they should be promoted as it reduces the problems of adverse selection and moral hazard encountered in SME loans. Nevertheless, these credit guarantee schemes should be evaluated periodically to improve its effectiveness to promote access to finance to SMEs.

Nonbank system in the Asia and Pacific region remains in its infancy as financial system in this region is bank centered. As Nonbank Financial Institutions, we consider those able to provide a wide range of business, such as leasing, factoring, invoice discounting and equity investment. Although they are present in a wide range of countries in the region (such as Bangladesh, Cambodia, Solomon Islands, Malaysia and others), their infancy can be exemplified by some countries. China has allowed the creation of microcredit firms to serve funding needs of SMEs in the national financial reform occurred in 2008. In India, nonbank

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[16] It is important to emphasize that it is not an analysis for all programs developed in the region, but rather a brief assessment of a non-exhaustive list of policies implemented to reduce the obstacles for access to finance.

financial companies are focusing on the SME sector as a new business area recently. Due to its relatively early stage of development, they have experienced a sharp growth in some countries, such as Papua New Guinea and Sri Lanka (22% in 2012 in the latter country). However, they remain playing a reduced role in this region, especially for SMEs. For instance, there were only 18 finance companies and 12 financial leasing companies operating in Viet Nam under central bank supervision at the end of 2012. In Kazakhstan, all factoring and leasing firms operating in the country do not service SME financing demands. Policies to encourage this type of financial support should be pursued, as they rely on the existence of collateral, such as in the case of leasing. Financial regulations to ensure contract obligations in these businesses constitute an effective way to reduce the supply-demand gap in the SME bank lending.

Capital market financing is even scarcer than all financial schemes mentioned previously, as they rely on the existence of a sophisticated financial society, including investors. Among all countries in the Asia and Pacific region, only seven countries provide capital market financing opportunities for high-end SMEs. Shenzhen Stock Exchange in China launched the SME Board in 2004 and the venture board, named ChiNext, in 2009. Korea is another case of success in terms of exchange market for SMEs. By 2012, more than one thousand firms were listed in both markets in China as well as in Korea. Philippines has launched the SME Board under their stock exchange in 2001, even before China, yet only two firms have been listed in it. Although Indonesia does not offer any specific SME capital market, they were more successful as 10 enterprises considered as SMEs have conducted initial public offerings in the Indonesia Stock Exchange. One of the reasons is their simplified disclosure documents compared to what is required for larger firms. Malaysia and Thailand do not offer specific markets to SMEs, but there are markets which these enterprises can tap. As a consequence, 112 SMEs are listed in Malaysia and 81, in Thailand. India is the country lagging behind, but they have launched two SME exchange markets: SME Platform under the Bombay Stock Exchange; and Emerge under National Stock Exchange. Although they could be encouraged by government policies, they require a more developed market in order to impact SMEs access to finance. In other words, it is the last step of financial development for SMEs.

Some countries in the Asia and Pacific region show a high degree of participation in the Global Value Chain and one of the most widely used form of finance nowadays is the Supply Chain Finance (SFC). SFC provides one or more financing products to assist the manufacture, supply and delivery products to end customers. One of the main advantages of SFC for SMEs is that credit risk is from the buyer, not the SME. This has a profound impact on the borrowing needs from SMEs as interest costs are at corporate levels which means lower than otherwise an SME would face. Moreover, many SME clients do not meet the financial statement criteria for a standard loan, because of weak financial conditions or they simply do not have accurate financial statements. Therefore, SFC reduces not only the financial costs of borrowing money but also the required documentation to get financial support. SMEs from the manufacturing sector are the most probable to benefit from this new financial tool. The only drawback is that it requires being part of the supply chain and those not able to be incorporated in these businesses links may remain struggling to access finance.

One venue yet not fully explored by the Asia and Pacific region in order to increase SMEs access to finance is internet. Internet is an important tool which has been used in South America to improve SMEs accessibility of financial support. After decades not being able to reach SMEs using the retailing banking system, the Brazilian Development Bank (BNDES) has introduced a new way to provide its financial support to SMEs through the internet,

named "Cartao BNDES". The main mechanism consists of SMEs enrolling in the program in the BNDES website and choosing a credit card company as well as a retailing bank to be their sponsors. All firms willing to sell their products (mainly capital goods and equipment) to SMEs also need to be registered in the system. Before retailing banking system denied credit to SMEs and these refusals were not reported to BNDES. Now, after SMEs applying through the internet, BNDES become aware of which firms have tried access credit and were denied by the retailing banking system. This program has increased substantially SMEs access to finance, as MSE comprehends more than 90% of the "Cartao BNDES" resources which reached more than USD 2.5 billion of disbursements yearly from 2012 to 2015.[17]

VIII.   Conclusion

In this paper, we have evaluated how access to finance and firms' performance, measured by productivity, are linked utilizing firm-level data from the Asia and Pacific region. Our results back up the empirical literature on this theme by showing that higher obstacles to access finance is negatively related to firms' productivity, not only their level but also their growth. When investigating it further by distinguishing firms by their size, we found that this relationship is stronger for SMEs. Moreover, among all obstacles investigated (political, criminality, taxes, corruption, informality and infrastructure), access to finance showed the most robust result. In other words, access to finance seems to be the most hitch to firms' development, which confirms findings in Ayyagari et al (2008) looking at employment and revenue growth. Moreover, recent research has showed credit constraints impinge firms to improve their performance, as shown in Lage de Sousa and Ottaviano (2014) for Brazil and Banerjee and Dufflo (2014) for India. Therefore, our findings suggest that asymmetric information and transaction costs are definitely limiting their access to finance and consequently their performance.

In terms of public policy, strategies to mitigate these financial constraints faced by firms in the Asia and Pacific region might enhance higher competition in the economy, as their finance accessibility might entitle them to grow and compete with larger firms in a more equal base. Increase number of firms competing in a market promotes development and social inclusion, especially because SMEs are responsible to a larger share of employment in the region. Although it makes sense as a general umbrella, it will definitely require specific policies to each country in the region. For instance, we have discussed in Section 6 different policies which have been implement in the region. It was clear that nonbank system is still underdeveloped compared to the traditional banking system and the expansion of the former represent an opportunity to reduce the gap of access to finance between SMEs and large firms. In terms of manufacturing, SCF consists of a new way to promote access to finance to SMEs because it reduces all costs involved in finance operations. Moreover, public policies to improve firms' access to finance may be able to explore other avenues as the internet, as it has been proved to be effective to increase firms' access to finance in other parts of the world.

Although SMEs seem to be the most impacted by credit restrictions, it is advisable to observe that targeting all SMEs might not be the most effective policy. Our results show that SMEs in manufacturing sector seems to be the most affected by credit restriction. As manufacturing

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[17] The remaining share is from medium-size firms. More information of this financial support can be obtained at www.bndes.gov.br.

sector also present higher levels of productivity, as evidenced in the introduction, mitigating the market failure of access to credit to these firms might enhance productivity growth, not only within but also between effects.[18] Recent literature in this topic also corroborate that not all SMEs might be interested in having better access to finance. For instance, Abdulasaleh and Worthington (2013) pointed out that some SMEs prefer to use their own resources or informal credit (for instance, financial assistance from family and friends) to finance their investments. The main explanation to this behavior resides on the fact that economic agents, including firms, are generally risk averse. As young SMEs are already confronting risks by just entering in the market, they might perceive having a formal external financial assistance as an extra risk to their business. As a consequence, they refrain on accessing banking financial support because they want to limit their risk to their own possibilities. Moreover, Banerjee (2014) has shown that removing financial constraints from start-ups present higher impact on their development rather than old SMEs. This pattern is corroborated by Klapper, Laeven and Rajan (2006), which showed that Italian SMEs are older than UK counterpart, but the latter grow faster. These results suggest that targeting younger SMEs, as advocated in Banerjee (2014), might be the most effective policy since they are the most impacted by removing their credit constraints. Further investigation considering start-ups versus old SMEs in the Asia and Pacific region may allow us to know if this should be the most effective policy.[19] Nevertheless, it is clear that SMEs performance is the most correlated to credit constraints in this region, especially those in the manufacturing sector.

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[18] See McMillan & Rodrick (2011) for further discussion on this issue.

[19] Only a very limited number of firms in the WBES can be considered start-ups which prevents us to investigate it further in this paper.

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Annex

A. Total factor productivity estimation strategy and results

Our dataset comprehends cross-section of different countries. Even when countries are surveyed twice the number of repeated firms is limited, as mentioned in Section 4. Therefore, OLS is the only feasible approach to estimate TFP. Despite being the most naïve method to estimate TFP, Van Beveren (2010) has shown that OLS TFP estimations are strongly correlated (some over 0.95) to other most sophisticated methods, such as Olley and Pakes (1996) and Levinshon and Petrin (2003). Although OLS approach is the only alternative, this recent literature results provide us evidence that other methods might only corroborate our results.

In order to preserve the representativeness, we have estimated production function for each survey isolated using firms' weights. We used sales as a measure of output. For input, we used number of employees to represent labor and capital is measured by the net book value of land, buildings, machinery, vehicles and equipment. Due to shortage of information on capital for the Pacific region, production function cannot be estimated for Fiji, Micronesia, Samoa and Vanuatu. Output and input values are taken in log for estimation and results are presented in Tables A.1, A.2 and A.3. As expected, share of labor is higher than capital in all countries as they are developing countries. After getting the estimates for each input (capital and labor), TFP is then calculated by the difference between the log of sales and log of the inputs multiplied by their share in the production.

Table A.1. Estimating total factor productivity by OLS (North and Central Asia)

Region	North And Central Asia											
Country	Afghanistan		Armenia		Azerbaijan		Kyrgyzstan		Russia		Tajikistan	
Year	2008	2014	2009	2013	2009	2013	2009	2013	2009	2012	2008	2013
Capital	0.1991**	0.2970	0.2023**	0.2352***	0.0928	0.2243**	0.3404***	0.4750**	0.2896***	0.2028***	0.1876**	0.1572*
	(0.087)	(0.268)	(0.090)	(0.084)	(0.072)	(0.096)	(0.123)	(0.220)	(0.062)	(0.036)	(0.094)	(0.078)
Labor	1.0881***	0.8001*	0.8335***	1.4651***	1.0398***	0.9233***	0.5798**	0.7746***	0.8538***	0.8246***	0.7720***	0.9117***
	(0.259)	(0.415)	(0.175)	(0.158)	(0.099)	(0.156)	(0.246)	(0.208)	(0.132)	(0.082)	(0.121)	(0.145)
Constant	9.6609***	9.9352**	12.4529***	17.8149***	7.5823***	6.1502***	8.4792***	7.1334**	9.7223***	11.4601***	7.7076***	8.2974***
	(1.068)	(3.476)	(1.270)	(1.182)	(0.732)	(1.358)	(1.280)	(2.744)	(0.774)	(0.380)	(0.991)	(0.805)
Observations	67	21	63	32	102	13	73	46	303	480	74	44
R-squared	0.4525	0.3256	0.6465	0.7845	0.7104	0.8533	0.5132	0.7262	0.6831	0.7303	0.5654	0.5922

Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

Table A.2. Estimating total factor productivity by OLS (South and Southwest Asia)

Region	South and Southwest Asia										
Country	Bangladesh		Bhutan	India	Nepal		Pakistan		Sri Lanka	Turkey	
Year	2007	2013	2015	2014	2009	2013	2007	2013	2011	2008	2013
Capital	0.3260***	0.1767***	0.2517**	0.2741***	0.1691**	0.2040***	0.2048*	0.5025***	0.4179***	0.2139***	0.3031**
	(0.037)	(0.022)	(0.100)	(0.017)	(0.080)	(0.054)	(0.106)	(0.077)	(0.073)	(0.057)	(0.138)
Labor	0.7455***	0.9095***	0.8948***	0.9101***	1.0769***	1.2437***	0.8939***	0.2396	0.8561***	0.8735***	0.4509**
	(0.060)	(0.035)	(0.244)	(0.027)	(0.200)	(0.136)	(0.214)	(0.223)	(0.101)	(0.079)	(0.191)
Constant	8.3573***	10.6717***	9.8409***	9.8210***	10.0931***	9.8993***	11.0640***	7.9702***	7.1509***	8.8881***	8.8635***
	(0.406)	(0.289)	(1.060)	(0.235)	(0.883)	(0.608)	(0.926)	(0.886)	(0.996)	(0.666)	(1.602)
Observations	1,491	1,095	60	4,803	97	181	129	228	240	488	383
R-squared	0.7292	0.7498	0.6661	0.5412	0.4855	0.6191	0.6410	0.4982	0.6906	0.5654	0.2779

Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

Table A.3. Estimating total factor productivity by OLS (East and Northeast Asia and Southeast Asia)

Region	East and Northeast Asia			Southeast Asia				
Country	China	Mongolia		Indonesia	Laos		Myanmar	Philippines
Year	2012	2009	2013	2009	2009	2012	2014	2009
Capital	0.1826***	0.3916***	0.1055	0.2066***	0.2186***	0.4119***	0.1828*	0.3076***
	(0.054)	(0.092)	(0.084)	(0.038)	(0.066)	(0.129)	(0.093)	(0.060)
Labor	0.7945***	0.8965***	1.0959***	1.1637***	0.6621***	0.7785***	0.5705***	0.8921***
	(0.048)	(0.165)	(0.103)	(0.097)	(0.125)	(0.238)	(0.094)	(0.114)
Constant	10.6086***	8.8768***	14.7890***	12.8317***	14.2040***	9.7396***	13.6700***	9.1084***
	(0.709)	(1.252)	(1.209)	(0.562)	(1.222)	(2.504)	(1.583)	(0.698)
Observations	1,409	129	48	633	359	41	135	477
R-squared	0.6354	0.6846	0.7012	0.5512	0.3496	0.4647	0.4906	0.5401

Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1.

B. Further results

Table B.1. Obstacles to labor productivity level (local currency)

VARIABLES	(1) All Firms	(2) Small	(3) Medium	(4) Large	(5) All Firms	(6) Small	(7) Medium	(8) Large
Log(Size)	0.0458***	0.1261***	0.1570***	-0.0659**	0.0479***	0.1229***	0.1630***	-0.0652**
	(0.008)	(0.037)	(0.032)	(0.026)	(0.008)	(0.038)	(0.032)	(0.026)
Log(Age)	0.0337**	0.0299	0.0207	0.0852**	0.0339**	0.0369	0.0198	0.0798**
	(0.017)	(0.026)	(0.027)	(0.036)	(0.017)	(0.026)	(0.027)	(0.036)
Multinational	0.2269***	0.2115	0.4450***	0.1574	0.2267**	0.1391	0.5000***	0.1504
	(0.082)	(0.134)	(0.133)	(0.145)	(0.091)	(0.165)	(0.140)	(0.149)
Exporter	0.3236***	0.2339***	0.3353***	0.3156***	0.3242***	0.1979**	0.3467***	0.3257***
	(0.029)	(0.075)	(0.044)	(0.050)	(0.030)	(0.078)	(0.044)	(0.051)
Finance	-0.0484***	-0.0637***	-0.0505***	0.0045	-0.0431***	-0.0566***	-0.0479***	0.0061
	(0.009)	(0.012)	(0.015)	(0.020)	(0.009)	(0.013)	(0.015)	(0.021)
Political	0.0208**	0.0197	0.0021	0.0537**	0.0202**	0.0220	-0.0031	0.0562**
	(0.010)	(0.014)	(0.015)	(0.025)	(0.010)	(0.015)	(0.015)	(0.025)
Crime	-0.0086	-0.0002	-0.0094	-0.0383	-0.0172	-0.0003	-0.0220	-0.0548*
	(0.011)	(0.016)	(0.019)	(0.028)	(0.012)	(0.018)	(0.019)	(0.028)
Taxes	0.0268**	0.0327*	0.0119	0.0063	0.0293**	0.0302	0.0180	0.0086
	(0.013)	(0.019)	(0.020)	(0.030)	(0.013)	(0.020)	(0.020)	(0.031)
Corruption	0.0161*	0.0317**	0.0108	-0.0022	0.0150	0.0283**	0.0131	-0.0017
	(0.009)	(0.013)	(0.014)	(0.021)	(0.009)	(0.014)	(0.015)	(0.021)
Informal Sector	-0.0221***	0.0007	-0.0258*	-0.0498**	-0.0240***	0.0042	-0.0310**	-0.0502**
	(0.009)	(0.013)	(0.014)	(0.021)	(0.009)	(0.014)	(0.014)	(0.022)
Infrastructure	0.0268**	0.0301*	0.0314*	0.0144	0.0234*	0.0179	0.0352*	0.0194
	(0.012)	(0.018)	(0.018)	(0.028)	(0.012)	(0.018)	(0.019)	(0.029)
Constant	13.6002***	12.5417***	10.1284***	14.7505***	9.9935***	12.2908***	9.8849***	11.6959***
	(0.676)	(0.245)	(0.198)	(0.463)	(0.164)	(0.234)	(0.232)	(0.657)
Observations	20 572	7 751	8 140	4 681	19 320	7 001	7 764	4 555
R-squared	0.5318	0.5751	0.5120	0.5408	0.5238	0.5645	0.5058	0.5404

Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1.

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