INTRODUCTION

The relationship between firm size and development has long intrigued the development economist (Anderson, 1982). In the global economy large firm size is identical with international competitiveness. Firm size is considered both a cause and effect of the successful international business firm that exports and conducts business abroad (Bernard and Jensen, 2004). At the same time does the innovation potential come from the small entrepreneurial firms (Acs and Audretsch, 1987, Rothwell, 1989).

Moving to the development and transition context such as the BRICS the situation is seemingly different (Van Stel et al., 2005). Established industry players and with significant influence from powerful business groups either of government, foreign, local or mixed origin, exist in an established oligopolistic rivalry. At the same time do firms from these countries contribute very little or marginally to global innovation. Most start-ups here begin with informal sector status (Levenson and Maloney, 1998). It is hard for this type of entrepreneur later on to legalise assets and thereby also create value through capital accumulation (de Soto, 2001). Innovation requires both a mental and financial excess that the entrepreneurs in developing and transition countries often do not possess or have easy access to.

Previous studies of the same relationships focusing on trade liberalisation as a source of introducing more competition in the local economy include a study of NAFTA and how trade liberalisation leads to a reduction in informal sector activity giving firms incentives for to switch towards the formal sector (Aleman-Castilla, 2006). In a similar vein Tybout (2003) finds that trade liberalisation has a pro-competition effect reducing average firm size in import-competing sectors in particular. Other studies have documented the link that exists between competition policy, productivity, corruption and economic growth (Voigt, 2009, Gutman and Voigt, 2014). The objective in this paper is to offer a simple formal economic model to make a theoretical contribution to how the informal sector (proxied with formal sector firm size in the empirical parts of the study) may be interacting with other important institutions in developing and transition countries such as competition towards creating barriers to entry into the formal sector for the small entrepreneurial firms. A secondary but equally important objective is to test the model using a multilevel dataset. This data makes it possible at the same time to control for firm-level variables such as firm age, while testing for the influence of country-level institutions on firm size and thereby also indirectly the extent of informal sector activity and how institutions may hamper the development of the entrepreneurial and creative potential of an economy.

These are important questions for public sector reformers, business firms and society in general. Through a realisation of the institutional factors that together regulate official firm size and informal sector activity, societies can better target their systems changes in the transition process towards creating less regulated, yet still fair markets wherein firms compete on their innovative potential rather than their sheer size, political connections and financial resources.

Section 2 offers a short review of the literature that analyses the relationship between firm size and the informal sector status of firms. Section 3 introduces a highly simplified industrial organisation model of the choice facing firms between operating in formal and informal markets. The data is introduced in Section 4. Section 5 presents the statistical results followed by a discussion and conclusion in Section 6.

LITERATURE REVIEW

In explaining the informal sector in developing countries there are at least two different schools that include an institutional perspective. One school sees informal sector activity as fundamentally a pull phenomenon whereas the other school sees the problem as one of push. Sometimes it is difficult to distinguish the two schools, but the argument is somewhat different and takes outset in different assumptions about the objective and identity associated with being an informal sector firm.

Porta and Shleifer (2008) in their seminal review of the informal economy literature operates with three categories (romantic, parasitic and dual) that tend to be more normative or outcome based rather than focusing on explanations of what creates informal sector activities in the first place. There is a clear overlap between the romantic view and the push school presented here. Oppositely are the parasitic and dual explanations entirely different to the ones presented in this paper. In those views and theories the formal and informal sectors exist to sort entrepreneurs by ability and the origins of informality have no real institutional grounding. For sake of brevity those contributions are ignored here.

The pull school

In the first case (the pull school), the firms are seen as having been already in existence. At some point they are pulled in their entity or partially towards the easier operating conditions in the informal sector (Gordon and Li, 2009, Ihrig and Moe, 2004). While the formal sector here is thought of as bureaucratic, corrupt and often over- or misregulated in various ways. Focus is on semi-legal status such as officially registered firms hiding parts of their output whilst still belonging officially to the formal economy domain (Johnson et al, 2000). The arguments about pulling firms out of official status towards illegality are often more prominent in the literature on transition countries (Wallace and Latcheva, 2006). Small and medium sized firms is somewhat a marginal phenomenon and especially at the onset of transition. This is perhaps why attention is shifted to the larger privatised firms as the more likely contributors to informal sector activity. This literature is quite consistent also with explanations for the developed countries where again the focus is on the comparative cost of operating out of the two sectors (see e.g. Gerxhani, 2004). Firms then choose the least costly sector especially if the cost differences are high or if firms undergo periods where their survival is challenged such as during episodes of economic crisis.

It is important to remember that this explanation is useful mostly for pre-existing firms that gradually over time undergo changes in their legality status. Firms may shift in and out between sectors and be involved in informal sector activity at various degrees. Consequently in this perspective informal sector activity and firm size should be unrelated.

The push school

The other school (the push school), sees informal sector activity as a push phenomenon. In this part of the literature the firms and typically the smaller firms operate out of the informal sector because they face few alternatives given high barriers to entry of various kinds (Loayza, 1996, Djankov et al, 2002, Huang, 2012). The small and entrepreneurial firms are seen as conceived by or born into the informal sector. Corruption may in part work as a device to keep the informal sector firms out of the formal sector. This view is more consistent with de Soto’s conception of the problems of informality, where the challenges of obtaining legality status are so difficult and cumbersome that firms opt for paying the relatively small fees (also sometimes called petty corruption) that will keep them afloat and survive in the informal part of the economy.

Legality may also be reserved for particular types of owners such as the state and foreign parts of the economy in China’s state capitalist model (Huang, 2012). The long run aim of firms in this literature is almost always to seek legality status over time (Williams, 2008) and the firms themselves consider their informal sector belonging as a temporary phase. Informal sector status could also be backed by a specific type of ethnic or social belonging that contains a certain element of informal institutions. Such institutions may to a varying extent exist in competition with the established national institutional environment (de Soto, 2003, Bigs and Shah, 2006, Estrin and Prevezer, 2010).

According to this literature there should be a strong relationship between the informal sector and firm size since the informal sector acts as a sorting device on firm size and the formal sector will mainly be populated by larger firms. Consequently this literature leads us to believe that there will be a positive association between informal sector activity and official firm size.

The subsequent model builds on the ideas and views that come from the push school. The aim is to establish with a simple formal model the linkages between the informal sector, entrepreneurship, institutions such as corruption and competition policy, and official firm size.

A SIMPLE MODEL OF ENTRY INTO FORMALITY

In this section is developed a simple dynamic model of firm entry decisions in a developing or transition country with corruption. The model serves to establish the important direct causal link that may exist between official sector firm size and competition policy while accounting for other relevant influences on firm size and also establishing the bridging link that makes it possible to equate (large) formal sector firm size with (a large) informal sector economy and hence the absence of a (formal) creative class of entrepreneurial firms.

Assumptions and background

The firm can either decide to enter the formal or the informal sector. The informal sector is only possible because of the existence of bribes. Here firms may pay a fee B to stay outside the rule of law for their basic protection. In the formal sector oppositely the sunk cost goes towards protecting the legal value and rights of the firms and its employees – e.g. through taxes, registration fees, social security etc.

Technology, policy and time together determine the size of entry cost (barriers to entry) into the formal sector which is labelled F. Contrary to most of the standard game theoretical literature on firm entry in industrial organisation, the fixed cost here play the pivotal role to the arguments. Instead of a sunk cost, there is in this model an optional entry fee into the formal sector (Dasgupta and Stiglitz, 1988). Most other assumptions of the model are standard. Prices in both sectors Pf and Pi and quantities Qi and Qf are determined by supply and demand in equilibrium. Demand in the formal sector takes the usual form Qdf = S-Pf. Demand or market size in the informal sector is assumed constant and exogenously given at M. Marginal cost of producing in each sector is labelled at Cf and Ci respectively. The number of firms in each sector is labelled as ni and nf.

The profitability edge between operating out of the formal or informal sector

Profits compared by the j’th firm from operating in the formal and informal sector are given by:

(eq. 3.1)

(eq. 3.2)

Firms are assumed as usual to be motivated solely by (short run) profit motivations and will therefore choose to enter the formal sector whenever:

(eq. 3.3)

That is from a partial perspective if the value difference is high enough or either the marginal cost difference or the fixed cost difference is small enough from operating in the formal sector relative to the informal sector. What will make the informal sector appear more profitable to entering firms? Very likely it is the short run consideration of lower marginal cost and at least myopically lower fixed cost of operating out of the informal sector. However, the backdrop will be the hampering of value potential – e.g. pi <<pf and especially so in the longer run, if informal sector firms cannot accumulate the necessary resources both organisationally, capital and human capital-wise for technological change or innovation. This is one of the problems of the informal sector in a long run welfare perspective (de Soto, 2003).

Equilibrium in the informal sector

The informal sector is assumed to compete in monopolistic competition facing a fixed market M where price discipline alone is ensured via free entry and exit thus making prices tend towards marginal cost. In the short run this means ‘everything goes’ – some firms make positive profits, others negative, some break even etc. The shut-down condition is in the short run alone determined by P=AVCi=MCi.

The organisation of the informal sector in the long run depends on the bribe structure. For example, there may be many small agents taking many small bribes or a few agents taking large bribes. This will depend on the history of bribery as an institution and also the specific industry in question. The more the industry depends on resources controllable by government, the more likely that also the informal part of the sector will be relatively concentrated on a few hands and monitored by a few agents in the informal sector. In the long run the informal sector will operate at the equilibrium price (Pi=ACi):

(eq. 3.4)

Which also gives the FES of individual firms in the informal sector:

(eq. 3.5)

Bribes may extract both direct profits (hence diverting the resources from potential future re-investment or capital accumulation and thereby also technological change) and also indirectly through a race to the bottom mechanism since there are no minimum wages or other similar standards (as there are no institutions to protect the rights of the workers) putting a ceiling on how low ci can become. Hence ci is likely to tend towards the level of subsistence wages in the informal sector.

Equilibrium in the formal sector

For simplicity it is assumed that the formal sector is organised de facto as a monopoly. In other words, if there is more than one firm in each industry (nf\*qf=Qf), the firms are assumed to collude to maximise total profits (max! pf(Qf)). This simplifying assumption has no major implications for the solutions, e.g. changing to a Cournot game would only alter some of the sub-solutions, but not change the overall results of the model. For example, Cournot showed, assuming that firms choose quantities based on the Cournot assumptions (everyone else continues to do what they are currently doing – e.g. no conjectures assumed) that profits are linearly decreasing in the number of firms starting from nf=1. Assuming perfect collusion when nf>1 reduces but does not remove this effect once the fixed costs are taken into account.

Given the above assumptions the profit maximising solution can be shown to be:

(3.6)

The long run equilibrium number of firms is decided by MES (P>AC):

(eq. 3.7)

Thus the number of firms in the formal sector nf increases with S and decreases with all cost for all relevant values of S and c (e.g. S>>c). Individual firm size (qf) may oppositely be neutral to S whereas it will always decrease with decreasing sunk cost. Assuming a given technological regime and stable institutions with learning and search for more efficient and less costly business models (dF/dt<0) there should be a natural drift in firm size over time towards relatively smaller firms.

Optimal firm size is at MES (minimum efficient scale) e.g. P=ACmin. However, given assumptions of constant marginal cost the optimal firm size goes to infinity. Hence actual firm size will be driven mainly by market size and competition institutions but never smaller than FES (feasible economies of scale – e.g. P=AC) which will be at:

(eq. 3.8)

Equilibrium between and within sectors with entry

The decision of the informal sector firms to enter the formal sector depends on the difference in expected profits from operating in either sector. In the informal sector all profits are bribed away. Hence the entry decision will only depend on the expected profits pf with n+1 firms in the formal sector. Therefore the solution to the entry decision may be written as the expected profits of the last entrant into the formal sector:

(eq. 3.9)

Recalling and inserting solutions from solution 3.6 we get:

(eq. 3.10)

Given these assumptions the entry decision will depend solely on the barriers to entry F, market size S and the existing number of firms in the industry n. Therefore in the ordinary industrial organisation sense of competition (Blaug, 2001) (as measured with concentration ratios or other indices that typically increase in n) a higher number of existing firms (more de facto competition or firms operating closer to their FES) will deter the incumbent informal sector firm from entering. This very simple result is obtained because of the simplifying assumption that prices in equilibrium are independent of n. In a more realistic model (e.g. Cournot or other forms of oligopoly) the effect on price of an increase in n will erode faster the benefits of the informal sector firm to enter the formal sector.

Entry with the time (technological and institutional change) factor

In a dynamic perspective with technological change, assuming for example that minor changes within a specific regime are driven by searches for business models to lower F, the institutions in part may play an aiding or hindering role for such new business models or drifts in F to be feasible.

In a dynamic perspective and assuming a natural evolution in industries and technologies over time, there will be a general drift so that dF/dt < 0 – again will the degree of competition as regulated by the institutions also aid or hinder that this drift is mirrored by actual developments in firm practises over time.

Hence at all times does there exist a latent and lower F that the institutions can allow to be realised or not through the barriers to entry. Major technological changes can also lead to large potential jumps in F. Whether firms can reap the potentials of such changes may largely depend on the accompanying institutional context within which the changes take place.

Implications for the hypothesised relationship between firm size, informal sector activity and competition policy

Translating the inequality in equation 3.10 into an applied setting the implications are that once the selection of firms over time (with their age) is controlled for and other basic factors (such as industry and quality of management) that may affect firm growth and size, it is expected that time itself has a negative influence on the average firm size. Market size will have a positive influence on firm size according to inequality 3.10. Intensity of competition (captured both with n and also through import competition in an open economy) is ambiguous. More intense competition will deter new entries (avoiding a decrease in firm size) while at the same time more intense competition will also work to challenge the existing power structure and thereby lead to a reduction in F and thus potentially lead to a decrease in firm size.

However, formal and informal institutions are the main regulating factors (besides industry or state of technology) of F where it is expected that corruption will increase F and thereby also firm size and increase the size of the informal economy, whereas oppositely competition policy will reduce F and thereby also have a negative influence on firm size and at the same time reduce the size of the informal economy. These propositions are now tested using firm level data from developing and transition countries.

THE DATA

The data is compiled from the World Bank’s enterprise surveys. Dethier et al (2008) provide for a review of econometric applications investigating firm performance using this survey data. The data was drawn from the comprehensive dataset (covering the period 2006-2014) that is comparable after the surveys were reformed and became more standardised and subject to more rigorous sampling techniques (see also Section 5). The total number of observations in the sample is in excess of 80,000 firms. The data variables used from the survey are explained in the upper part of Table 1 (firm-level variables).

INSERT TABLE 1 HERE

The country level variables are obtained either from the World Economic Forum’s Competitiveness Report or from the World Bank’s Ease of Doing Business Indicators. The variable measuring corruption is from International Country Risk Guide published by the PRS Group. The variable for endangered species was taken from the Guardian’s red list. Finally the variables measuring competition policy were compiled from Voigt (2006, 2009) and Gutmann and Voigt (2014). In the final version of the paper was only used the variable that captures competition policy with the number of years that the formal institution has been in place in each country as this variable is available for more countries in the sample relative to the measures reported in Voigt (2006). Hereby all the country level indicators are sampled around the years 2009-2011, except for the competition policy variable which is measured in years relative to the time the firms in each country were surveyed the last time (e.g. in some countries the surveys were conducted twice over the period of study). Descriptive statistics are reported in the Appendix Table A1.

REGRESSION RESULTS

Table 2 reports the results for testing the multi-level model. The upper part of the table reports results for the firm-level variables that vary by firms and countries. The lower part of the table reports the results for the country-level variables that only vary by country.

INSERT TABLE 2 HERE

The firm-level variables take the expected sign and are all significant except for the domestic dummy. This is not surprising as the majority of the sample consist in firms that belong to this category (more than 85%).

Notice that the firms are sampled using a stratified sampling technique on basic characteristics such as size and branch (e.g. there is an overweight of large firms sampled in each country). In the survey datasets sampling weights are reported separately by country. However, this information cannot be used consistently when pooling the whole enterprise survey dataset across countries. Therefore the assumption is that there is a large firm bias in the sampling technique. But since it is similar across all countries it cannot prevent us from investigating the influence that country-level variables such as institutions have on firm-level variables such as firm size (captured with number of employees).

This assumption is also indirectly confirmed with the aggregate between effect model (reported in column 3) where the firm-level variables are adopted as country means. Most of the differences (except for age and propensity to export) disappear when the firm-level variables are adopted as national aggregates. If the sampling scheme biases the possibility to observe the desired effect it will only be in the direction of making it more difficult to observe the relationship between firm size and institutions. (E.g. since the sampling scheme will tend to make this difference disappear through the stratification rules adopted).

The interpretations and discussion therefore now centres on the variables that measure institutions related with competition. It is with these data that the model and the hypothesised relationships between firm size and institutions can be tested.

Competition policy is negative and significant as expected which is interpreted so that countries with a longer tradition for conducting an active competition policy (as competition policy is here measured by the number of years that the institution has been formally in place) are inhabited by firms that are smaller. Even though the effect seems small it is not for countries with a long tradition of being active in this realm of developing their competition institutions. For every year a country has had a competition policy it reduces firm size with 0.2% according to the results in column 1 of Table 2.

Corruption takes the opposite sign than what we would expect since a higher score on the index from International Country Risk Guide measures freedom from corruption. However, in the model the corruption that is associated with the informal sector is a petty type of corruption and does not exclude other forms of corruption also associated with formal sector status (for example many formal sector firms in the enterprise surveys report that they pay bribes). Another problem with the corruption index is that the variance in the sample is relatively small (e.g. most of the sampled countries suffer from quite severe levels of corruption). Many of the firms and countries that it would be ideal to compare with (e.g. the OECD) are not included when micro data is collected by international organisations such as the World Bank (instead one would have to consult national surveys which have the problem that they are much less prone for cross-country studies of this type).

The time it takes to start-up a firm also takes the opposite sign than what is expected since the more cumbersome the procedures are, the higher the perceived entry barriers and thus the more likely that the firm would enter the informal sector instead, stay out of the formal sector and thereby not be included in the official firm size data as observed with these type of surveys.

The remainder of the country-level variables take the expected sign and are all significant in the pooled OLS results. Countries with more efficient customs procedures (and thereby indirectly facing more competition via international trade) have smaller firms. The more ordinary trade barrier variable (a higher score signifies more import competition) has a similar interpretation. Somewhat surprisingly in countries that encourage FDI (again the measuring scale is reversed) firms tend to be larger. Population or market size has the expected impact on the average size of firms and this effect is very robust across all models. Countries that have been in transition for the last two decades have generally much larger firms. This is to be expected as they were formerly socialist (see also Appendix Table A2 for a listing of all countries included in the study) and therefore generally lag in terms of having established and developed institutions associated with competition.

The pooled OLS and the model that takes into account the possibility of unobserved cluster effects by country render the same coefficient estimates, whereas typically the standard errors are larger in the random effect model (second column). It is considered a standard requirement to adopt the procedure for clustered robust standard errors in panels and similarly in multilevel data (Wooldridge, 2003). However, this is only relevant if it is believed that there truly are unobserved cluster effects that would affect firm size besides those already accounted for. The pooled OLS results here must be considered fairly robust as the sample size at the upper level is at 70 countries (see e.g. Bryan and Jenkins, 2013). Furthermore a quite high number of country-level variables are included. But robustness checks in columns 2 and 3 indicate that there are problems with the model, the variables or the combination of variables that prevent us from relying on the interpretations of the OLS model.

Much of the fallibility of the above results for the institutional variables may be related with validity concerns. One major barrier in the study is for example the lacking availability of many institutional variables for the full sample of 127 countries. This tends to clutter the robustness of results in particular with the between effect model. The reduction in sample size at the upper level significantly increases standard errors and the associated probability values because of the much lower degrees of freedom associated with these estimates (Wooldridge, 2003). Related concerns are with the reliability of some of the measures. In particular is the portion of corruption associated with the informal sector impossible to observe and it is near impossible to obtain reliable estimates for the size of the informal sector for this nearly exhaustive cross-country sample of developing and transition countries. Last but not least there is also the concern about the violation of the assumption of exogeneity between firm-level characteristics and institutional variables since firm-level characteristics over time are likely to be correlated with the institutions that have shaped their existence since birth.

INSERT TABLE 3 HERE

In Table 3 therefore the general robustness of an institutional or systematic variable that is believed to be strongly correlated with the type of institution that is in mind and firm size is adopted. The power of this variable lies in the fact that it is externally generated and entirely exogenous to the economic system. The variable is the number of endangered species on the Guardians red list and includes all species in the natural environment of each country considered to be endangered. This variable may stand instead of the entrepreneurs as an endangered species. Because entrepreneurship anywhere also in transition and developing countries abound due to the innate creativity that is part of human nature just as natural species do in nature. However, the humanly created institutions in the same countries often put many of these species in danger by creating barriers for their natural growth. While at the same time the need for adopting standards and practices that will help to encourage and preserve them and allow them better conditions for their survival is ignored.

The other variable is also exogenous to the economic system. However, this variable is believed to be completely random to the effect in search of since it consists in a count of the number of letters in each country’s name. Another great advantage of these two variables is that they are broadly available across the 127 countries sampled. Table 3 reports the results. The endangered species variable is positive and significant across all three specifications and increases in size and significance in the last column for the between effect model. The interpretation is straightforward. The more endangered species there are in a country the larger is the firm size. Oppositely is the random variable (number of letters) never significant across any of the specifications. These results for the externally generate variables render considerable support for the previously obtained results and also suggest that part of the watering out of the results for the institution level variables in the statistically more robust models may be due to a combination of concerns with respect to sample size, reliability and violation of the assumption of exogeneity among the regressors.

INSERT TABLES 4A AND 4B HERE

Tables 4a and 4b render results when splitting the sample by ownership. This can help to investigate for the assumption about exogeneity between the firm-level and country level variables. For example, firm-level variables are more likely to be endogenous to the institutions for the domestic part of the sample. Domestic firms are natural to their home country environment whereas the foreign firms often are not (Jensen and Peng, 2013).

The results for the domestic firms in the sample give similar results to those for the full sample except for the corruption variable which is now insignificant even in the pooled OLS model. In the between effect model economic system is now significant and also it is found that in countries open to FDI, domestic firms tend to be larger. For the foreign owned firms sample customs procedures and barriers to FDI are now insignificant in the pooled OLS model. While oppositely corruption has a larger coefficient estimate (interpreted so that less corruption increases foreign firm size) and is also significant in the equation that includes an unobserved cluster effect. In the between effect model trade barriers is now the main factor, absence of which renders competitive pressure to reduce the size of these firms. The changes in the coefficient estimates for the institutional factors and in particular for the barriers to FDI variable suggest some endogeneity between firm-level variables such as ownership and country level variables. However, comparing the results for the full between effect model also strongly suggests that while foreign firm size in developing and transition countries is closely associated with their foreign trade status while for domestic firms innate factors related with firm history and home market size are more important in combination with foreign trade status.

As a last robustness check possible endogeneity among the country-level variables was investigated by stepwise exclusion of each of the country level variables. However, none of the country-level variables changed sign and the sizes of the parameter estimates were also not majorly affected by adopting this procedure.

Overall the disciplining effect of competition on firm size in developing and transition countries and to the extent it is possible to observe with the available data is found to be determined more from abroad via the disciplining effect of international trade. Whereas the results for own economic system institutions such as competition policy are less robust. However, the adoption of the externally generated variable or instrument for domestic institutions such as competition policy strongly vindicates the importance of national institutions towards determining firm size. Problems of data availability and reliability prevent us from fully observing this effect with the relevant economic system variables.

DISCUSSION AND CONCLUSION

The paper investigates for the relationship between firm size and the institutions of corruption and competition in the context of economies that are on the verge of rule of law. It is not possible to directly model the influence of competition on the informal sector due to lack of valid data on such hidden economic activity in each country. Therefore firm size is a proxy for the relationship that exists between informal sector activity and entrepreneurship or the lack hereof.

Using a simple model of the firms’ decision to operate in the formal or informal sector of the economy leads to the hypothesis that both the informal sector, the presence of corrupt practices and official competition policy along with a number of other factors behind barriers to entry (such as the time it takes to start up a firm) play a role towards understanding the workings of competition in regulating entry and thereby firm size. The model shows that to improve the conditions of competition it is necessary while building competition institutions and liberalising international trade also to target in particular petty corruption practices in the informal sector. These practices allow entrepreneurs to survive on a day-by-day basis in the informal sector. Focusing on survival the entrepreneurs compromise the more long-term viability of their business in the formal sector.

The model is tested using multilevel data from the World Bank’s enterprise surveys and combining it with country level information from a variety of sources such as the World Competitiveness Report and the Ease of Doing Business Indicators.

Common problems of multilevel data are addressed using a number of strategies to improve study robustness. One is to address the constraint in the number of observations at the upper level. Another is to draw in data that is externally generated (e.g. not economic in nature) that is believed to be either systematically or randomly related with the institutional variables and of a more valid nature among other due to wider availability. Potential within and between endogeneity in the multilevel data is addressed using standard techniques of exclusion and sample splitting.

The results confirm the model expectations for most of the variables except for the impact of corruption including time to start-up a business which is commonly believed to be an important barrier to entry in these environments. The lack of results for the corruption variable or the reverse sign obtained may be due to its multiple roles related with the business sector in transition and developing countries whereby it is not systematically associated with firm size. Another barrier for investigating the relationship between firm size and corruption in the sample is the relatively low variance due to high or moderate to high levels of corruption across all the countries investigated.

Competition policy has the hypothesised disciplining effect on firm size but is not robust to models that include unobserved cluster effects or that solely model the between effect variation and that use the appropriate standard errors and degrees of freedom in calculating coefficient significance. However, its relative importance is underscored by adopting a variable that can stand instead of the aggregate impact national institutions have on entrepreneurs. This approach strongly vindicates the relevance of national institutions such as competition policy and informal sector activity. The effect cannot fully be observed with the available data since institutions are extremely complex to account for in all their dimensions and difficult to measure in simple quantitative ways.

International trade in particular via the reduction in ordinary barriers to trade but also in improved customs procedures are the most important parts of the national environment that is found to render a robust disciplining effect on firm size in the study and in particular for the foreign owned part of the firm population. However, it is absence of corruption both in customs and more generally that propagate the necessary conditions for foreign firms to grow in these environments. While innate factors such as market size, present and past economic system and the age of the firm population are the most important explanatory variables behind domestic firm size in these countries.

This is one of the first studies to document a direct link between firm size and competition policy in the context of emerging economies while controlling for the influence of trade liberalisation and reforms of international trade institutions at the local level. The findings support previous findings, showing that there is an important link both between trade liberalisation and firm size (and therefore also indirect informal sector activity). While the independent effect of competition policy on firm size that has not previously been document can also here only be indirectly established using an instrumental variable.

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