Small and Medium Enterprises Across the Globe

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ABSTRACT. This paper analyzes the relationship between the relative size of the small and medium enterprise (SME) Sector and the business environment in 76 countries. The paper first describes a new and unique cross-country database that presents consistent and comparable information on the contribution of the SME sector to total employment in manufacturing and GDP across different countries. We then relate the importance of SMEs and the informal economy to indicators of different dimensions of the business environment. We find that several dimensions of the business environment, such as lower costs of entry and better credit information sharing are associated with a larger size of the SME sector, while higher exit costs are associated with a larger informal economy.

KEYWORDS: Small and Medium Enterprises

JEL CLASSIFICATIONS: L11, L25, L26, O17

1. Introduction

The World Bank Review on Small Business Activities[1] establishes the commitment of the World Bank Group to the development of the small and medium enterprise (SME) sector as a core element in its strategy to foster economic growth, employment and poverty alleviation. In the year 2004 alone, the World Bank Group has approved roughly $2.8 billion in support of micro, small and medium enterprises. There is also a growing recognition of the role that SMEs play in sustained global and regional economic recovery.[2] However, there is little systematic research in this area backing the various policies in support of SMEs, primarily because of the lack of data. Hallberg (2001) actually suggests that scale-based enterprise promotion is driven by social and political considerations rather than by economic reasoning.

This paper presents comprehensive statistics on the contribution of the SME sector to total employment in manufacturing and to GDP across a broad spectrum of countries. Since SMEs are commonly defined as formal enterprises, we complement the SME statistics with estimates of the size of the informal economy. We then explore a policy area closely related to the SME sector, the business environment. Specifically, using a regression-based ANOVA approach, we assess how much of the cross-country variation in the size of the SME sector in manufacturing can be explained by cross-country variation in various business environment regulations, including the ease of firm entry and exit, labor regulations, access to credit and contract enforcement. Next, we employ linear and instrumental variable regressions to gauge the economic importance of specific policies for the size of the SME sector, while controlling for reverse causation and simultaneity bias. This also helps us assess (i) whether large SME sectors in manufacturing reflect the entry of a large number of new enterprises over and above exits due to failures or the growth of successful SMEs into larger enterprises, or (ii) whether large SME sectors are really the result of stifling regulations that prevent entry and exit, and provide incentives for firms to stay small.

This paper makes several contributions to the literature. First, the data compiled and presented greatly improve upon existing data on SMEs, which have been very scarce.[3] Efforts to compile data on the size of the SME sector

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across countries have been plagued by several problems of comparability and consistency. Different countries adopt different criteria – such as employment, sales or investment – for defining small and medium enterprises. Hence different sources of information on SMEs use different criteria in compiling statistics.[4] Even the definition of an SME on the basis of a specific criterion is not uniform across countries. For instance, a specific country may define an SME to be an enterprise with less than 500 employees, while another country may define the cut-off to be 250 employees.

Second, our paper goes beyond presenting simple statistics on the importance of SMEs in manufacturing and the informal economy and relates the data to the variation in business environment across countries. This allows us to address a crucial deficiency of the size indicators of the SME sector. Large SME sectors in manufacturing can be the result of frequent entry of new and innovative firms, despite the growth of successful SMEs into large firms and efficient exit of failing SMEs. However, distributional policies that subsidize small enterprises and regulatory policies that give incentives to stay small can also lead to large SME sectors. By relating specific dimensions of the business environment to the size of the SME sector in manufacturing, we go beyond the static picture of SMEs and conduct a preliminary assessment of the dynamic dimensions of the SME sector.

Our results show that low entry costs, easy access to finance (low costs of registering property which makes it easier to put up collateral) and greater information sharing all predict a large SME sector in manufacturing, even after controlling for reverse causality. We find a weak association between high exit costs and employment rigidities and a large SME sector in the OLS regressions, which does not hold when we control for reverse causality. Thus we find stronger support for the hypothesis that a large SME sector is due to a competitive business environment that allows and encourages entry of new innovative firms, and much weaker evidence for the "stagnant" theory that a large SME sector could be the result of stifling regulations like high exit costs and labor regulations. This is confirmed by our findings on the char-

acteristics of countries with large informal economies: countries with higher exit costs and more rigid employment laws see a larger share of their economic activity undertaken informally.

This paper is related to Beck et al. (2005a) who assess the relationship between the importance of SMEs in manufacturing and GDP per capita growth, changes in income inequality and poverty alleviation. While the authors find a positive relationship between the share of SMEs in manufacturing and GDP per capita growth, this relationship is not robust to controlling for reverse causation and simultaneity bias. This suggests that a large share of SMEs is a characteristic of successful economies, but not a cause of economic success. These findings are robust to controlling for the business environment. While Beck et al. (2005a) look at the relationship between the importance of SMEs and economic development and poverty alleviation, in this paper, we explore the relationship between SMEs, the informal economy and different dimensions of the business environment.

The remainder of the paper is organized as follows. Section 2 defines various SME and informal economy indicators used in this paper. In Section 3 we explore the relationship between the SME sector and the business environment, and Section 4 concludes.

2. Indicators of SMEs and the informal economy

In this section, we define the various variables used to describe the relative importance of SMEs and the informal sector in different countries. The same dataset is used by Beck et al. (2005a) to assess the relationship between SMEs, economic growth and poverty alleviation. The term SME covers a wide range of definitions and measures, varying from country to country and varying between the sources reporting SME statistics. Some of the commonly used criteria are the number of employees, total net assets, sales and investment level. However, the most common basis for definition is employment, and here again, there is variation in defining the upper and lower size limit of an SME. Despite this variance, a large number of sources define an SME to have a cut-off of 250 employees. Our discussion of SMEs focuses mostly on the manufacturing sector since

our indicators on SME contribution to employment focus only on SMEs in this sector. SMEs are defined as formal enterprises and are thus different from informal enterprises. Our indicators of the informal economy, on the other hand, refer to the overall economy and were compiled by other researchers.

Our main SME indicator is based on employment. SME250 is the share of the SME sector in the total formal labor force in manufacturing when 250 employees are taken as the cutoff for the definition of an SME. For a country to be classified under the SME250 classification, the SME sector cutoff could range from 200 to 300 employees. There are few instances of this range occurring, with data for most other countries reported for an exact cut off of 250 employees.[5] We have 54 countries in the SME250 sample. In constructing the employment figures for different countries, we use multiple sources, and any available data from the 1990s. So the SME250 indicator is an average over time and sources.

We also construct an alternate employment measure where we retain the official country definition of SMEs. SMEOFF is the share of the SME sector in total formal labor force in manufacturing when the official country definition of SMEs is used, with the official country definition varying between 100 and 500 employees. Countries which defined SMEs on a category other than employment were dropped from our sample. For countries, which do not have an official definition of SMEs, and for countries where we do not have data according to the official cut off, the cut-off data from the most reliable source was used for SMEOFF.[6] Consequently, we have 76 countries in the SMEOFF sample. Since only some countries have 250 employees as the official cut-off, the number of countries in the SME250 sample is a subset of the number of the countries in the official sample.[7] Similar to the SME250 sample, the SMEOFF measures constructed are numbers averaged over the 1990s. Appendix A2 discusses the various sources used in construction of the SME250 and SMEOFF indicators.[8]

To measure the contribution of the SME sector to the economy we use SME_GDP, which gives the share of the SME sector, as defined by official sources, relative to GDP.[9] Unlike the employment indicators, SME250 and SMEOFF, this indicator refers to all sectors of the economy and is not limited to manufacturing. Given the different size distributions across the different sectors – agriculture, manufacturing and services, SME_GDP might thus not be comparable to the other two indicators. As in the case of SMEOFF, variance in the official definition of the SME sector may drive part of the variation in this indicator. We have data for 35 countries.

Since SMEs are conventionally defined as formal enterprises, we augment our database with estimates of the size of the informal economy. Note that both the informal indicators refer to the overall economy, not just the manufacturing sector. We first use the estimates reported by Schneider (2000) who estimates the size of the shadow economy labor force for 76 developing, transition and OECD countries. Using this data, we obtain the labor force of the shadow economy as a percent of official labor force, INFORMAL, averaged over the 1990s for 34 countries in our sample.

To obtain estimates of the informal sector's contribution to GDP, we use data from Friedman et al. (2000). They report two sets of estimates originally from the Schneider and Enste (1998) dataset. We use an average of these two estimates for this paper. Values for missing countries in this sample are obtained from Schneider (2000) who uses the currency demand approach and the DYMIMIC model approach to estimate the size of the shadow economy. Both papers report the average size of the shadow economy as a percentage of official GDP, labeled as INFO_GDP in our sample. Once again, the data used in this paper is averaged over the 1990s. We thus have data on the shadow economy for 55 countries in the sample.

The importance of the SME sector and the informal sector varies greatly across countries. Table I presents the different indicators of the size of the SME sector and the informal economy, as well as GDP per capita. While less than 5.5% of the formal work force is employed in SMEs in Azerbaijan, Belarus and Ukraine, this share is 80% or more in Chile, Greece, Spain, and Thailand (SME250), thus comprising almost all of the private sector. Similarly, the ratio of the informal

TABLE I
SMEs and informal activity across countries

Nation	GDP/Capita	SME250	SMEOFF	SME_GDP	INFORMAL	INFO_GDP
Albania	744.07		9.49			
Argentina	7483.77	70.18	70.18	53.65		21.80
Australia	20930.40		50.60	23.00		15.30
Austria	29619.35	66.10	66.10		16.00	10.45
Azerbaijan	558.29	5.34	5.34			47.20
Belarus	2522.94	4.59	4.59	9.00		16.65
Belgium	27572.35	69.25	69.25			18.65
Brazil	4326.55	59.80	59.80		49.21	33.40
Brunei	17983.77		69.40			
Bulgaria	1486.74	50.01	50.01	39.29	63.00	31.25
Burundi	170.59		20.51			
Cameroon	652.67	20.27	20.27		61.40	
Canada	19946.50		58.58	57.20		11.75
Chile	4476.31	86.00	86.50		40.00	27.60
Colombia	2289.73	67.20	67.20	38.66	53.89	30.05
Costa Rica	3405.37		54.30			28.65
Cote d'Ivoire	746.01	18.70	18.70		59.65	
Croatia	4453.72	62.00	62.00		70.00	23.50
Czech Republic	5015.42	64.25	64.25			12.35
Denmark	34576.38	68.70	78.40	56.70	15.40	13.60
Ecuador	1521.39	55.00	55.00	20.03	58.80	31.20
El Salvador	1608.91		52.00	44.05	46.67	
Estonia	3751.59	65.33	65.33			17.85
Finland	26813.53	59.15	59.15			13.30
France	27235.65	67.30	62.67	61.80	9.00	12.10
Georgia	736.79	7.32	7.32		36.67	53.10
Germany	30239.82	59.50	70.36	42.50	22.00	12.80
Ghana	377.18	51.61	51.61		71.76	
Greece	11593.57	86.50	74.00	27.40		24.20
Guatemala	1460.47	32.30	32.30		50.25	55.70
Honduras	706.01		27.60			46.70
Hong Kong, China	21841.82		61.50			13.00
Hungary	4608.26	45.90	45.90	56.80		29.85
Iceland	27496.90		49.60			
Indonesia	963.33		79.20		37.45	
Ireland	19528.13	67.20	72.10			14.25
Italy	19218.46	79.70	73.00	58.50	39.00	22.20
Japan	42520.01	71.70	74.13	56.42		11.10
Kazakhstan	1496.16		12.92		40.00	28.25
Kenya	340.85	33.31	33.31		41.10	
Korea, Rep.	10507.69	76.25	78.88	45.90	19.62	38.00
Kyrgyz Republic	972.25	63.22	63.22		40.00	
Latvia	2418.82		20.63			29.80
Luxembourg	45185.23	70.90	70.90	76.30		
México	3390.17	48.48	48.48			38.05
Nicaragua	432.34		33.90			
Nigeria	256.55	16.72	16.72		48.85	76.00
Netherlands	27395.01	61.22	58.50	50.00		12.65
New Zealand	16083.78		59.28	35.00	9.20	10.15
Norway	33657.02		61.50			11.30
Panama	2998.63	72.00	72.00	60.12		51.05
Peru	2162.12	67.90	67.90	55.50	54.56	50.95
Philippines	1099.31	66.00	66.00	31.50	30.63	50.00
Poland	3391.08	63.00	61.81	48.73		16.45
Portugal	11120.81	79.90	81.55	67.25		16.20

TABLE I
Continued

Nation	GDP/Capita	SME250	SMEOFF	SME_GDP	INFORMAL	INFO_GDP
Romania	1501.08	37.17	37.17	33.60	42.73	17.55
Russian Federation	2614.38	13.03	13.03	10.50	42.18	34.30
Singapore	22873.66		44.00			13.00
Slovak Republic	3651.45	56.88	32.07	37.10		10.00
Slovenia	9758.43		20.26	16.65	31.00	
South Africa	3922.60		81.53			
Spain	15361.80	80.00	74.95	64.70	21.90	20.00
Sweden	27736.18	61.30	56.50	39.00	19.80	13.80
Switzerland	44716.54		75.25			8.55
Taiwan, China	12474.00	68.60	68.60		14.50	16.50
Tajikistan	566.44		35.91			
Tanzania	182.85	32.10	32.10		42.24	31.50
Thailand	2589.83	86.70	86.70			71.00
Turkey	2864.80	61.05	61.05	27.30		
Ukraine	1189.84	5.38	5.38	7.13		38.65
United Kingdom	19360.55	56.42	56.42	51.45		10.40
United States	28232.07		52.54	48.00		12.20
Vietnam	278.36	74.20	74.20	24.00		
Yugoslavia, Fed. Rep.	1271.12	44.40	44.40			
Zambia	418.93	36.63	36.63			
Zimbabwe	643.84	15.20	15.20		33.96	

The variables are defined as follows: GDP/Capita is the real GDP per capita in US$. SME250 is the SME sector's share of formal employment when 250 employees is used as the cut-off for the definition of SME. SMEOFF is the SME sector's share of formal employment when the official country definition of SME is used. SME_GDP is the SME sector's contribution to GDP (The official country definition of SME is used). INFORMAL is the share of the shadow economy participants as a percentage of the formal sector labor force. INFO_GDP is the share of the shadow economy participants as a percentage of GDP. Values are 1990–99 averages for all the variables.

economy relative to GDP varies from 9% in Switzerland to 76% in Nigeria. On average, SME250 constitutes 54% of the economy and SMEOFF 51%. The average ratio of the informal economy to GDP across our sample of developed and developing countries is 26%.

While the importance of informal enterprises decreases with economic development, the importance of formal small and medium-sized enterprises increases with GDP per capita. Panel A of Table II presents the correlation matrix for GDP per capita and our indicators of the SME and the informal sectors. The SME sector's contribution to both employment and GDP shows a strong positive correlation with GDP per capita, while INFORMAL and INFO_GDP are significantly negatively correlated with GDP per capita.[10] We see strong positive correlations between the SME variables themselves, while we see only a weak (10% significance level) correlation between the two measures of the relative importance of the informal sector. The SME employment measures, SME250 and SMEOFF are negatively correlated with the measures of the informal economy. Note, however, that due to the limited sample overlap, the number of observations for some of these correlations is very low.

3. SMEs, the informal economy, and the business environment

Documenting the contribution of SMEs and the informal sector to employment and GDP provides us with an important first illustration of the importance of these two sectors. However, these are static illustrations that do not allow an assessment of the underlying dynamics that drive the development of formal and informal small and medium enterprises. This section therefore relates the variation in the size of the SME sector and the informal economy across countries to differences in the business environment in which firms operate. Specifically,

TABLE II
Correlations

Panel A

	GDP/Capita	SME250	SMEOFF	SME_GDP	INFORMAL
SME250	0.43*** (N = 54)				
SMEOFF	0.44*** (N = 76)	0.98*** (N = 54)			
SME_GDP	0.51*** (N = 35)	0.68*** (N = 29)	0.70*** (N = 35)		
INFORMAL	−0.72*** (N = 34)	−0.35* (N = 29)	−0.31* (N = 34)	−0.32 (N = 17)	
INFO_GDP	−0.65*** (N = 55)	−0.32** (N = 43)	−0.31** (N = 55)	−0.17 (N = 30)	0.51* (N = 25)

Panel B

	SME250	SMEOFF	SME_GDP	INFO_GDP	Entry Costs	Contract Enforcement Costs	Exit Costs	Property Costs	Credit Information Index
SMEOFF	0.98***								
SME_GDP	0.68***	0.70***							
INFO_GDP	−0.32	−0.31**	−0.17						
Entry Costs	−0.45***	−0.37***	−0.09	0.31*					
Contract Enforcement Costs	−0.33**	−0.10	−0.09	0.19	0.40***				
Exit Costs	0.05	−0.06	−0.01	0.25	0.24**	0.32***			
Property Costs	−0.17	−0.12	0.00	0.19	0.62***	0.33***	0.20*		
Credit Information Index	0.67***	0.67***	0.64***	−0.26	−0.34***	−0.29**	−0.22*	−0.15	
Employment Index	−0.07	−0.04	−0.06	0.23	0.25**	0.26**	0.21*	0.28*	−0.08

Correlations between the SME sector and INFORMAL sector are presented in Panel A of the table. Correlations of the SME sector and the business environment variables are presented in Panel B of the table. The SME and INFORMAL sector variables are defined as follows: SME250 is the SME sector's share of total employment when 250 employees is taken as cutoff for the definition of SME. SMEOFF is the SME sector's share of total employment when the official country definition of SME is used. SME_GDP is the SME sector's contribution to GDP (The official country definition of SME is used). INFORMAL is the share of the shadow economy participants as a percentage of total labor force. INFO_GDP is the share of the unofficial economy as a percentage of GDP. GDP/Capita is the GDP per capita in US$. Entry Costs are the costs associated with starting a business defined as the official cost of each procedure (as a percentage of income per capita). Contract Enforcement Costs are the official costs associated with enforcing contracts, expressed as a percentage of debt value and includes the associated cost, in court fees, attorney fees, and other payments to accountants, assessors, etc. Exit Costs are the costs of closing a business, expressed as a percentage of the estate. Property Costs are the official costs involved with registering property. The Credit Information Index is the index of credit information availability. Employment Index is the average of three sub-indices: Difficulty of Hiring index, Rigidity of Hours index, Difficulty of Firing index. Panel A also reports the number of observations used to calculate the correlations. Detailed variable definitions and sources are given in the appendix. ***, ** and * stand for significance levels at 1, 5 and 10 percent respectively.

we relate our indicators of the SME sector and the informal economy to indicators of the ease of entry and exit, contract enforcement, access to credit and labor regulations. While the business environment indicators refer to firms of all sizes, previous research has shown that financial and institutional underdevelopment constrains the growth and operation of small and medium size firms significantly more than that of large firms (Beck et al., 2005b). In this section, we first discuss different business environment indicators and how they might be related to the size of the SME sector and the informal economy and then employ regression based ANOVA to assess the extent to which cross-country variation in business environment can explain cross-country variation in the size of the SME sector and the informal economy. Finally, we use both OLS and IV regressions to gauge the economic importance of specific policies for the size of the SME sector in manufacturing and the informal economy, while controlling for reverse causation and simultaneity bias.

3.1. *Indicators of business environment*

Theory provides ambiguous predictions about the correlations between the business environment and the size of the SME sector in manufacturing. On the one hand, easy entry and exit, sound contract enforcement, effective property rights registration and access to external finance can foster a thriving and vibrant SME sector with high turnover that sees a lot of entry of new and innovative firms, the growth of successful firms unconstrained by rigid regulations and exit of unsuccessful ones. On the other hand, costly entry and exit, rigid labor regulations and re-stricted access to external finance can also foster a large SME sector, but one that consists of many small enterprises that are either not able to grow or do not have incentives to grow be-yond a certain size. Relating different indicators of the business environment to the size of the SME sector will thus help us explore why countries have large SME sectors.

Entry Costs are the costs of registration rel-ative to income per capita that a start-up must bear before it becomes legally operational (Djankov et al., 2002). Specifically, it includes

the legal cost of each procedure to formally register a company and relates the sum of these costs to gross national income (GNI) per capita. In our sample, Entry Costs vary from 0.2% of GNI per capita in countries like New Zealand to a maximum of 304.7% of GNI per capita in Zimbabwe with an average of 36.30% of GNI per capita over the entire sample.

Exit Costs measures the costs of closing a business, as percentage of the estate (Djankov et al., 2003a). Specifically, it includes all legal court costs and other fees that are incurred when closing a limited liability company. Exit Costs range from 1% in Netherlands, Norway, Fin-land, Singapore and Colombia to 38% of the estate in countries like Albania, Panama, Phil-ippines, and Thailand with a sample average of 12.4% of the estate.

Costs of contract enforcement are the legal costs – in attorney fees and court costs – incurred in dispute resolution relative to the value of the disputed debt. The data is from Djankov et al. (2003b). The average value of the cost of contract enforcement in this sample is 19.6% of the dis-puted value and varies from to 4.2% in Norway to 126.5% of the disputed value in Indonesia.

Property registration costs are the costs related to official transfer of a property from a seller to a buyer, including all fees, taxes, duties and other payments to notaries and registries as required by the law (Djankov et al., 2004). The costs are computed relative to the value of the property. The costs of property registration range from to 0.2% in New Zealand and Belarus to a high of 27.2% of property value in Nigeria, with a sample average of 5.58% of property value.

The Credit Information index indicates the information that is available through credit registries, such as positive and negative infor-mation, information on firms and households, data from sources other than financial institu-tions, and historical data (Djankov et al., 2006). This index ranges from zero to six, with higher values indicating that more information is available.

Based on employment laws and regulations, the Rigidity of employment indicator measures the rigidity of the labor market (Botero et al., 2004). Specifically, it is the average of three sub-indices that measure the difficulty of hiring, the rigidity of

working time and the difficulty of firing. More rigid labor laws add to the costs of formality. The index ranges from 0 in countries like Hong Kong and Singapore and 3 in the United States to 74 in Cameroon, with a mean of 40.72.

Our business environment indicators are subject to two caveats. First, they are measured in the early 2000s. While there is thus a timing mismatch between the SME/informal economy indicators and the indicators of the business environment and thus potential measurement bias, the business and regulatory environment varies relatively little over time. Further, we utilize IV techniques to extract the exogenous component of the business environment, which also controls for the measurement bias. Second, these indicators measure mostly the laws on the books. While controlling for GDP per capita might somewhat control for the application and actual enforcement of these rules in reality, a bias might still exist.

Panel B of Table II presents correlations of the Business Environment indicators with our SME indicators. Higher entry costs are correlated with smaller SME sectors. Lower contract enforcement costs and better credit information sharing are associated with a larger SME250 and a larger SMEOFF though the correlation between the contract enforcement and SME-OFF measure is not significant. Credit Information sharing is also strongly positively correlated with SME contribution to GDP. Higher entry costs are positively correlated with a larger informal economy. These correlations do not control for GDP per capita, which is highly correlated with many of these business environment indicators. The business environment indicators between themselves are significantly correlated. Entry Costs and Contract Enforcement Costs are negatively correlated with Credit Information sharing and strongly positively correlated with all other Business Environment indicators.

3.2. *How much does the business environment matter for SMEs and informal activity? Variance analysis*

In this section, we evaluate the importance of country and business environment characteristics

in explaining the contribution of the SME and the informal sector to employment and GDP, respectively.[11] Our analysis relies on the following reduced-form model of SME contribution. Let y be the dependent variable of interest, SME250, SMEOFF or INFO_GDP.

$$y_i = \mu + \alpha_i + \varepsilon_i \qquad (1)$$

where μ is the average SME/informal sector contribution across all countries, α_i are country effects ($i = 1, N$), and the ϵ_i are random disturbances. We analyze the model using a regression based simultaneous ANOVA approach first described in Schmalensee (1985).

This methodology has been recently used in the finance literature in the context of examining determinants of proper rights protection (Ayyagari et al., 2005) and the importance of country and firm characteristics in explaining corporate governance (Stulz et al., 2004).[12] In this paper, we use this approach to explain the variance of SME and informal economy contribution to employment and GDP using the variance in country-level business environment indicators. The advantage of this methodology is that it allows us to focus directly on the general importance of these effects in explaining SME/informal contribution, without any assumptions on *causality* or structural analysis.

In each case, we regress the SME or informal economy variable on dummy variables capturing each of the country level indicators. There are several non-linearities associated with the scaling of the country level variables as shown in Ayyagari et al. (2006). Hence, to have a uniform treatment of all variables, we construct a five-point scale for each variable, based on its quintiles, and then perform variance component analysis using this five-point scale. The adjusted R^2 in the model are indicative of the importance of the country level factor in explaining SME contribution to employment. We also report F-tests for the null model where the country effect has been restricted to zero.[13]

Panels A and B of Table III shows that Entry Costs and Credit Information Sharing explain the most of the variation in the size of the SME sector in manufacturing across countries. Variation in Entry costs, in fact, explains more than half (51.7%) of the variation in SME250 and

TABLE III
SMEs, informal activity, and the business environment: variance explained

	Entry Costs	Contract Enforcement Costs	Exit Costs	Property Costs	Credit Information Index	Rigidity of Employment Index
Panel A: SME250						
Country Effect	0.5169	0.1231	0.0550	0.1335	0.3168	−0.067
F-Test	0.0000	0.0543	0.1527	0.0444	0.0003	0.8698
Panel B: SMEOFF						
Country Effect	0.3334	0.1199	0.0342	−0.0037	0.3348	−0.0392
F-Test	0.0000	0.0230	0.1729	0.4451	0.000	0.7903
Panel B: INFO_GDP						
Country Effect	0.4326	0.3929	0.2572	−0.0241	−0.0027	0.1394
F-Test	0.0000	0.0000	0.0012	0.5769	0.4212	0.0348

This table documents the contribution of each country effect to the adjusted R^2 of the regression model. The regression equation estimated is: SME250/SMEOFF/INFO_GDP $= \alpha + \beta_1$ (Entry Costs or Contract Enforcement Costs or Exit Costs or Property Costs or Credit Information Index or Employment Index). The variables are defined as follows: SME250 is the SME sector's share of total employment when 250 employees is taken as cutoff for the definition of SME. SMEOFF is the SME sector's share of total employment when the official country definition of SME is used. INFO_GDP is the share of the unofficial economy as a percentage of GDP. Entry Costs are the costs associated with starting a business defined as the official cost of each procedure (as a percentage of income per capita), Contract Enforcement Costs are the official costs associated with enforcing contracts, expressed as a percentage of debt value and includes the associated cost, in court fees, attorney fees, and other payments to accountants, assessors, etc. Exit Costs are the costs of closing a business, expressed as a percentage of the estate. Credit Information Index is the index of credit information availability. Property Costs are the official costs involved with registering property. The Employment Index is the average of three sub-indices: Difficulty of Hiring index, Rigidity of Hours index, Difficulty of Firing index. All variables are rescaled on a point scale and dummy variables are used in the regression. Each specification also reports the p-values of the F-test for the null hypothesis that the country effect is zero. Detailed variable definitions and sources are given in the appendix.

33% of the variation in SMEOFF. Credit Information Sharing explains about 32% of the variation in SME250 and is similar in explanatory power to Entry Costs (33%) in explaining the variation in SMEOFF. Contract enforcement costs explain much lesser variation in SME250 and SMEOFF at 12%. The costs associated with registering property explain 13% of the variation in SME250 but is negligible in explaining any variation in SMEOFF. Interestingly, variations in Labor regulations and Exit costs do not contribute significantly to the variation in the size of the SME sector.

In Panel C we examine the importance of business environment variables in explaining the variation in the contribution of the informal sector to GDP across all industries. Once again Variation in Entry costs explains the most variation in INFO_GDP (43%) followed by contract enforcement costs (40%) and exit costs (26%). While variations in Labor regulations do not explain much of the variation in the size of the SME sector, they explain nearly 14% of the variation in the size of the informal sector. This suggests that the flexibility in labor regulations such as in the hiring and firing of workers and the rigidity of the number of work hours and vacation days is more important for the informal sector than for the formal SME manufacturing sector. High labor market restrictions have an effect on employers' costs and workers' incentives and are an important cause of high official rates of unemployment while simultaneously leading to an expansion of the shadow economy that employs many of the officially unemployed labor force. The table also shows that costs associated with registering property and the credit information index contribute very little to explaining the variation in the size of the informal sector.

The variance decomposition approach allows us to explain the relationship between the size of the SME and informal sectors and the business environment and the economic size of this relationship. However, it does not allow us to make statements about the sign of this relationship and the direction of causality. We address this question in the following sections using ordinary regression analysis and

instrumental variables to control for endogeneity issues.

3.3. *SMEs, informal activity and the business environment: OLS regressions*

The results in Table IV show a significant association of several dimensions of the business environment with the size of SME sectors in manufacturing across countries, though often in contradictory ways. Panel A presents regressions with SME250, Panel B presents regressions with SMEOFF, and Panel C with INFO_GDP. Since we have documented the significant correlation of the importance of SMEs and of the informal economy with per capita income, all regressions control for the log of GDP per capita.

Countries with higher GDP per capita, lower entry and property registration costs, higher exit costs and more effective credit information sharing systems have larger SME sectors in manufacturing, if 250 employees are taken as the cut-off (Panel A). None of the other indicators enters significantly. Using the official definition of SMEs, we find that countries with higher GDP per capita, with lower cost of entry costs, more effective systems of credit information sharing and more rigid employment regulations have larger SME sectors (Panel B). The Panel C regressions suggest that countries with lower GDP per capita, higher exit costs and more effective systems of credit information sharing have bigger informal economies. Most but not all results are confirmed when we include all business environment indicators at the same time in the regressions, as shown in column 7 of the three panels, which is not surprising given the high correlation between some of them.

The OLS regressions provide support for both hypotheses concerning the interpretation of a large SME sector. The positive correlation of high exit costs and employment rigidities with a large SME sector seems to suggest that failure to efficiently resolve failing enterprises artificially increases the SME sector (as the cost would be expected to be relatively higher for small than for large firms). On the other hand,

TABLE IV
SMEs, informal activity, and the business environment: OLS regressions

	1	2	3	4	5	6	7
Panel A: SME250							
Constant	32.238** [13.911]	3.195 [19.734]	−21.669 [15.498]	13.271 [13.480]	3.159 [11.870]	−4.844 [14.348]	21.620 [19.713]
GDP/Capita	3.863** [1.543]	6.888*** [1.942]	8.804*** [1.589]	6.224*** [1.457]	4.856*** [1.735]	7.472*** [1.467]	3.424 [2.056]
Entry Costs	−0.161*** [0.041]						−0.122** [0.051]
Contract Enforcement Costs		−0.111 [0.260]					−0.207 [0.237]
Exit Costs			0.500* [0.273]				0.482* [0.248]
Property Costs				−1.010** [0.419]			−0.214
Credit Information Index					3.682** [1.524]		2.025 [1.477]
Employment Index						0.026 [0.133]	0.071 [0.116]
N	45	45	45	45	45	45	45
R-squared	0.549	0.385	0.428	0.458	0.458	0.383	0.616
Panel B: SMEOFF							
Constant	26.417* [15.618]	−14.558 [14.636]	−11.95 [14.994]	6.578 [14.076]	4.624 [10.498]	−15.341 [13.764]	−2.000 [19.461]
GDP/Capita	4.002** [1.699]	7.919*** [1.538]	7.610*** [1.524]	6.157*** [1.484]	3.656** [1.518]	7.534*** [1.368]	3.861* [1.959]
Entry Costs	−0.112** [0.045]						−0.090* [0.049]
Contract Enforcement Costs		0.191 [0.138]					0.19 [0.127]
Exit Costs			0.284 [0.269]				0.172 [0.249]
Property Costs				−0.433 [0.454]			−0.098 [0.463]
Credit Information Index					4.986*** [1.446]		4.288*** [1.438]
Employment Index						0.192* [0.113]	0.147 [0.105]
N	62	62	62	62	62	62	62
R-Squared	0.372	0.329	0.32	0.318	0.423	0.339	0.516
Panel C: INFO_GDP							
Constant	113.044*** [16.778]	83.510*** [16.171]	82.972*** [13.642]	94.819*** [12.508]	104.104*** [10.229]	97.378*** [13.060]	71.108*** [20.335]
GDP/Capita	−9.793*** [1.746]	−7.183*** [1.555]	−7.158*** [1.359]	−8.166*** [1.291]	−10.437*** [1.308]	−8.482*** [1.280]	−7.725*** [1.965]
Entry Costs	−0.055 [0.076]						−0.058 [0.080]
Contract Enforcement Costs		0.331 [0.200]					0.165 [0.195]
Exit Costs			0.461** [0.199]				0.421** [0.201]
Property Costs				0.499 [0.364]			0.644* [0.374]
Credit Information Index					3.014** [1.261]		2.590** [1.248]
Employment Index						0.076 [0.086]	0.023 [0.080]

TABLE IV
Continued

	1	2	3	4	5	6	7
N	47	47	47	47	47	47	47
R-Squared	0.557	0.578	0.601	0.57	0.604	0.56	0.686

The regression equations estimated are: SME250/SMEOFF/INFO_GDP $= \alpha + \beta_1$ GDP/Capita $+ \beta_2$ Entry Costs $+ \beta_3$ Contract Enforcement Costs $+ \beta_4$ Exit Costs $+ \beta_5$ Property Costs $+ \beta_6$ Employment Index $+ \beta_7$ Credit Information Index. The variables are defined as follows: SME250 is the SME sector's share of total employment when 250 employees is taken as cutoff for the definition of SME. SMEOFF is the SME sector's share of total employment when the official country definition of SME is used. INFO_GDP is the share of the unofficial economy as a percentage of GDP. GDP/Capita is the Log of GDP per capita in US\$. Entry Costs are the costs associated with starting a business defined as the official cost of each procedure (as a percentage of income per capita), Contract Enforcement Costs are the official costs associated with enforcing contracts, expressed as a percentage of debt value and includes the associated cost, in court fees, attorney fees, and other payments to accountants, assessors, etc. Exit Costs are the costs of closing a business, expressed as a percentage of the estate. Credit Information Index is the index of credit information availability. Property Costs are the official costs involved with registering property. The Employment Index is the average of three sub-indices: Difficulty of Hiring index, Rigidity of Hours index, Difficulty of Firing index. Detailed variable definitions and sources are given in the appendix. Standard errors are reported in parentheses. *, **, and *** represent significance at 10%, 5% and 1% levels respectively.

the positive correlation of easier entry, lower property registration costs and more efficient credit information sharing with a large SME sector seems to indicate that large SME sectors are characterized by more frequent entry, and thus higher competitiveness and contestability, and better access to external finance. Similarly, we find contradictory evidence on the relationship between exit costs, the efficiency of credit information sharing and the importance of the informal economy. In the following section, we turn to IV regressions to assess which results hold when controlling for reverse causation and simultaneity bias.

3.4. *SMEs, informal activity and the business environment: IV regressions*

The results in Panel A of Table V indicate that the relationships between credit information sharing, cost of entry, property right registration and SME250 are robust to controlling for reverse causation and simultaneity bias. Similarly, in Panel B, we find a positive relationship between credit information sharing and SME-OFF, but no significant relationship between SMEOFF and the other business environment indicators. Panel C suggests a positive association of the contract enforcement costs, the rigidity of employment laws and the importance of the informal economy. Here we employ IV regressions by using exogenous country characteristics to extract the exogenous component of business environment, and relate it to the size of the SME and informal sectors. Specifically, we use legal origin dummies, since cross-country analyses show that differences in legal systems influence the quality of government provision of public goods (La Porta et al., 1998, 1999; Djankov et al., 2003b). We include ethnic fractionalization, since Easterly and Levine (1997) show that ethnic diversity tends to reduce the provision of public goods, including the institutions that support business transactions and the contracting environment. We include the share of Catholic, Muslim and Protestant population, as research has shown that countries with predominantly Catholic and Muslim populations are less creditor-friendly (Stulz and Williamson, 2003). Finally, we

TABLE V
SMEs, informal activity, and the business environment: IV regressions

	1	2	3	4	5	6
Panel A: SME250						
Constant	57.148**	26.946	−35.808	25.95	13.015	−21.941
	(22.223)	(40.708)	(32.043)	(22.296)	(15.018)	(17.557)
GDP/Capita	1.365	4.908	9.861***	5.301**	0.992	7.860***
	(2.291)	(3.608)	(2.725)	(2.025)	(2.286)	(1.592)
Entry Costs	−0.273***					
	(0.098)					
Contr. Enforcement Costs		−0.511				
		(0.600)				
Exit Costs			0.887			
			(0.678)			
Property Costs				−1.776*		
				(0.933)		
Credit Information Index					9.190***	
					(2.635)	
Employment Index						0.336
						(0.243)
N	45	45	45	45	45	45
First Stage Adj. R^2	0.354	0.521	0.141	0.186	0.482	0.155
OIR Test	0.189	0.047	0.032	0.088	0.758	0.087
F-Test of Instruments	0.0048	0.0001	0.0099	0.019	0.0001	0.0002
Panel B: SMEOFF						
Constant	−30.503	−20.702	9.101	−17.006	4.883	−21.637
	(42.331)	(25.065)	(35.215)	(25.693)	(11.309)	(16.649)
GDP/Capita	9.718**	8.443***	5.988**	8.049***	3.522*	7.866***
	(4.246)	(2.312)	(2.944)	(2.251)	(1.956)	(1.390)
Entry Costs	0.117					
	(0.161)					
Contr. Enforcement Costs		0.281				
		(0.305)				
Exit Costs			−0.286			
			(0.875)			
Property Costs				0.835		
				(1.203)		
Credit Information Index					5.198*	
					(2.637)	
Employment Index						0.279
						(0.182)
N	62	62	62	62	62	62
First Stage Adj R^2	0.4516	0.3547	0.2144	0.2889	0.4582	0.3593
OIR Test	0.857	0.72	0.6675	0.7724	0.891	0.8606
F-Test of Instruments	0.0048	0.0001	0.0099	0.019	0.0001	0.0002
Panel B: INFO_GDP						
Constant	71.213**	49.491**	109.479***	89.567***	91.087***	104.237***
	[26.635]	[23.457]	[37.097]	[15.666]	[25.650]	[13.106]
GDP/Capita	−5.655**	−4.338**	−9.348***	−7.750***	−8.093***	−11.194***
	[2.528]	[2.099]	[3.320]	[1.489]	[2.253]	[1.421]
Entry Costs	0.194					
	[0.233]					
Contr. Enforcement Costs		0.886**				
		[0.343]				

TABLE V
Continued

	1	2	3	4	5	6
Exit Costs			−0.125 [0.646]			
Property Costs				0.79 [0.618]		
Credit Information Index					0.149 [0.140]	
Employment Index						4.478* [2.390]
N	47	47	47	47	47	47
First Stage Adj R^2	0.6629	0.5205	0.2125	0.4173	0.3242	0.3557
OIR Test	0.4164	0.6728	0.1435	0.1939	0.1597	0.2663
F-Test of Instruments	0.0048	0.0001	0.0099	0.019	0.0001	0.0002

Two Stage Lease Square regressions are used. In the first stage, the regression equation estimated is Business Environment = α + β_1 Common Law + β_2 German Civil Law + β_3 French Civil Law + β_4 Socialist Law + β_5 Latitude + β_6 Catholic + β_7 Muslim + β_8 Protest + β_9 Ethnic Fractionalization + β_9 GDP per capita. The second stage regression equation estimated is SME250/SMEOFF/INFO_GDP = α + β_1 GDP per capita + β_2 (predicted value of) Business Environment. The variables are defined as follows: SME250 is the SME sector's share of total employment when 250 employees is taken as cutoff for the definition of SME. SMEOFF is the SME sector's share of total employment when the official country definition of SME is used. INFO_GDP is the share of the unofficial economy as a percentage of GDP. GDP/Capita is the Log of GDP per capita in US$. Business Environment is one of the following variables: Entry Costs is the cost associated with starting a business defined as the official cost of each procedure (as a percentage of income per capita), Contract Enforcement Costs is the official costs associated with enforcing contracts, expressed as a percentage of debt value and includes the associated cost, in court fees, attorney fees, and other payments to accountants, assessors, etc. Exit Costs is the cost of closing a business, expressed as a percentage of the estate. Credit Information Index is the index of credit information availability. Property Costs is the official costs involved with registering property. The Employment Index is the average of three subindices: Difficulty of Hiring index, Rigidity of Hours index, Difficulty of Firing index. Latitude is the absolute value of a country's latitude, scaled between zero and one. Ethnic Fractionalization is the probability that two randomly selected individuals in a country will not speak the same language. Catholic, Muslim, and Protestant indicate the percentage of the population that follows a particular religion (Catholic, Muslim, Protestant or religions other than Catholic, Muslim or Protestant, respectively). Common Law is the common-law dummy, which takes the value 1 for common law countries and the value zero for others. French civil law is the French-law dummy, which takes the value 1 for French civil countries and the value zero for others. German civil law is the German civil law dummy, which takes the value 1 for German civil law countries and the value zero for others. Socialist law is the Socialist law dummy, which takes the value 1 for transition countries and the value zero for others. In the second stage, predicted values of the business environment variables are used from the first stage. Each specification reports the adjusted R^2 from the first stage, the joint F-test of the instruments used and the test of the overidentifying restrictions (OIR test), which tests the null hypothesis that the instruments are uncorrelated with the residuals of the second stage regression. Detailed variable definitions and sources are given in the appendix. Standard errors are reported in parentheses.

*, **, and *** represent significance at 10%, 5% and 1% levels respectively.

include latitude, calculated as the absolute value of the capital's latitude, since research has shown that countries closer to the equator have lower levels of financial and institutional development (Beck et al., 2003). To assess the appropriateness of our instruments, we include an F-test of the explanatory power of the excluded exogenous variables in the first stage and the Hansen test of overidentifying restrictions, which tests whether the excluded exogenous variables are not correlated with the

dependent variables beyond their impact through GDP per capita or the business environment indicators.

The results in Panel A indicate that ease of entry and property right registration and the efficiency of credit information sharing have a positive association with SME250, which is robust to controlling for reverse causation and simultaneity bias. Exit Costs, significant in the OLS regressions, do not enter significantly. In all cases, the first-stage F-test that the excluded exogenous

variables do not explain the business environment indicators, is rejected. However, the test of over-identifying restrictions that the excluded exogenous variables are not correlated with SME250 beyond their effect through GDP per capita or the respective business environment indicator is not rejected at the 5% level, except in the contract enforcement and exit cost regressions. We note that exit costs and employment rigidities have positive yet insignificant coefficients.[14] In Panel B, Credit Information Sharing enters positively and significantly at the 10% level and the specification tests do not reject the validity of the instruments. In Panel C, Cost of contract enforcement and employment rigidity enter positively and significantly and the specification tests do not reject the validity of the instruments.[15]

Overall, these results provide evidence that larger SME sectors are robustly associated with a competitive business environment that facilitates entry, eases the establishment of property rights and fosters access to external finance by providing for more efficient credit information sharing. Similarly, our findings suggest that higher costs of contract enforcement and more rigid employment laws prevent informal enterprises from entering the formal economy. However, there is also weaker evidence that market rigidities such as higher exit costs and labor market imperfections may be associated with larger SME sectors.

4. Conclusions

This paper introduces a new and unique set of cross-country indicators of the contribution of SMEs to employment in manufacturing and to wealth creation. The dataset reveals a significant variation in the size and economic activity of the SME sector across countries; while there are few SMEs in many transition economies, the SMEs constitute most of the private sector in other developing countries.

We presented evidence that some dimensions of the business environment can explain cross-country variation in the importance of SMEs. Specifically, cross-country variation in the effectiveness of information sharing and the ease of entry can explain variation in the relative importance of SMEs in manufacturing. Our regression results indicate that reducing costs of entry and property rights protection and allowing for more efficient credit information sharing results in a larger employment share of SMEs in manufacturing. These results are robust to controlling for reverse causation and simultaneity bias. Similarly, lower contract enforcement costs and less rigid employment laws can reduce the importance of the informal economy. We find weaker evidence suggesting that a larger SME sector may be associated with higher costs associated with exit of firms and labor markets. This suggests that a larger role of SMEs in manufacturing is more strongly associated with a competitive business environment.

Our findings suggest that policy makers who are interested in a large SME sector should focus on fostering a competitive business environment. However, the findings also illustrate that it is difficult to interpret the dynamics of the SME sector with simple aggregate statistics. More data and analysis are needed to gauge the interaction between business environment and the success of small and medium enterprises across countries.

Appendix

TABLE I
Variable definitions and sources

Variable	Variable Definition	Source
Indicators of the SME Sector and the Informal Sector		
SME250	Share of the SME sector in the total formal labor force in manufacturing when 250 employees is taken as the cutoff for the definition of an SME.	See Appendix A2
SMEOFF	Share of the SME sector in total formal labor force in manufacturing when the official country definition of SMEs is used.	See Appendix A2
SME_GDP	Share of the SME sector, as defined by official sources, relative to GDP.	See Appendix A3

TABLE I

Continued

Variable	Variable Definition	Source
INFORMAL	Share of the labor force of the shadow economy as a percent of official labor force.	Schneider (2000)
INFORMAL_GDP	Average size of the shadow economy as a percentage of official GDP.	Friedman et al. (2000), Schneider and Enste (1998)

Business Environment Indicators

Entry Costs	The legal costs of each procedure involved in formal registration of a company, relative to income per capita, that a start-up must bear before it becomes legally operational. The text of the Company Law, the Commercial Code, and specific regulations and fee schedules are used to calculate costs. If there are conflicting sources and the laws are not clear, the most authoritative source is used. The constitution supersedes the company law, and the law prevails over regulations and decrees. If conflicting sources are of the same rank, the source indicating the most costly procedure is used, since an entrepreneur never second-guesses a government official. In the absence of fee schedules, a governmental officer's estimate is taken as an official source. In the absence of a government officer's estimates, estimates of incorporation lawyers are used. If several incorporation lawyers provide different estimates, the median reported value is applied. In all cases, the cost excludes bribes.	World Bank Doing Business Database
Contract Enforcement Costs	The indicator measures the official cost of going through court procedures, including court costs and attorney fees where the use of attorneys is mandatory or common, or the costs of an administrative debt recovery procedure, expressed as a percentage of the debt value.	World Bank Doing Business Database
Exit Costs	All legal court costs and other fees that are incurred when closing a limited liability company, expressed as a percentage of the total value of the estate. The cost of the bankruptcy proceedings is calculated based on answers by practicing insolvency lawyers. If several respondents report different estimates, the median reported value is used. Costs include court costs, as well as fees of insolvency practitioners, independent assessors, lawyers, accountants, etc. Bribes are excluded. The cost figures are averages of the estimates in a multiple-choice question, where the respondents choose among the following options: 0–2%, 3–5%, 6–10%, 11–15%, 16–20%, 21–25%, 26–50%, and more than 50% of the estate value of the bankrupt business.	World Bank Doing Business Database
Property Costs	Cost to register property. These include fees, transfer taxes, stamp duties, and any other payment to the property registry, notaries, public agencies, or lawyers, if required by law. Other taxes, such as capital gains tax or value-added tax (VAT), are excluded from the cost measure. If cost estimates differ among sources, the median reported value is used. Total costs are expressed as a percentage of the property value, calculated assuming a property value of 50 times income per capita.	World Bank Doing Business Database
Credit Information Index	This index measures rules affecting the scope, access and quality of credit information available through either public or private bureaus. A score of 1 is assigned for each of the following six features of the credit information system: (i) Both positive and negative credit information (for example on payment history, number and kind of accounts, number and frequency of late payments, and any collections or bankruptcies) is distributed. (ii) Data on both firms and individuals are distributed. (iii) Data from retailers, trade creditors and/or utilities as well as financial institutions are distributed. (iv) More than five years of historical data is preserved. (v)Data on loans of above 1 percent of income per capita is distributed. (vi) By law, consumers have the right to access their data. The index ranges from 0 to 6, with higher values indicating that more credit information is available from either a public registry or a private bureau to facilitate lending decisions	World Bank Doing Business Database

TABLE I
Continued

Variable	Variable Definition	Source
Rigidity of Employment Index	The Rigidity of Employment index is the average of three sub-indices: a Difficulty of Hiring index, a Rigidity of Hours index, and a Difficulty of Firing index. All sub-indices have several components and take values between 0 and 100, with higher values indicating more rigid regulation.	World Bank Doing Business Database
Instruments		
Legal Origin	An indicator of the type of legal system in the country. It takes the value 1 for English Common law, 2 for French Civil Law, 3 for German Civil Law, 4 for Scandinavian Civil Law and 5 for Socialist Law countries.	La Porta et al. (1999), Djankov et al. (2003)
Religion	An indicator of the dominant religious group in the country. It takes the value 1 for Catholics, 2 for Protestants, 3 for Muslims, and 4 for Others.	La Porta et al. (1999)
Ethnic Fractionalization	Probability that two randomly selected individuals in a country will not speak the same language.	Easterly and Levine (1997)
Latitude	Absolute value of the latitude of a country, scaled between zero and one.	La Porta et al. (1999)

TABLE II
Official country definitions of SMEs

Country	Official Definition of SME	Time Period of Data	Source
Albania	500	1994–95	United Nations Economics Commission for Europe
Argentina	200*	1993	Inter-American Development Bank-SME Observatory
Australia	100	1991	APEC, 1994: *The APEC Survey on Small and Medium Enterprises.*
Austria	250	1996	Eurostat
Azerbaijan	250*	1996–97	United Nations Economics Commission for Europe
Belarus	250*	1996–97	United Nations Economics Commission for Europe
Belgium	250*	1996–97	Eurostat
Brazil	250	1994	IBGE-Census 1994
Brunei	100	1994	APEC Survey
Bulgaria	250*	1995–97, 1999	Center for International Private Enterprise, Main characteristics of SME: Bulgaria Country Report, Institute for Market Economics
Burundi	100	90s	Regional Program on Enterprise Development Paper # 30
Cameroon	200	90s	Regional Program on Enterprise Development Paper # 106
Canada	500*	1990–93, 1996, 1998	Presentation to the Standing Committee on Industry, Science and Technology, APEC Survey, Globalization and SME 1997(OECD)
Chile	200*	1996	Inter-American Development Bank-SME Observatory
Colombia	200	1990	Inter-American Development Bank-SME Observatory
Costa Rica	100	1990, 92–95	Inter-American Development Bank-SME Observatory
Cote D'Ivoire	200	90s	Regional Program on Enterprise Development Paper # 106, #109
Croatia	250	1998	United Nations Economics Commission for Europe, Center for International Private Enterprise
Czech Republic	250*	1996	United Nations Economics Commission for Europe
Denmark	500	1991–92	Globalization and SME 1997(OECD), International Labor Organization
Ecuador	200	1994	Inter-American Development Bank-SME Observatory

TABLE II
Continued

Country	Official Definition of SME	Time Period of Data	Source
El Salvador	150*	1993	Inter-American Development Bank-SME Observatory
Estonia	250*	1996–97	United Nations Economics Commission for Europe
Finland	250*	1996–97	Eurostat Database
France	500	1991, 1996	International Labor Organization, OECD SME Outlook
Georgia	250*	1996–97	United Nations Economics Commission for Europe
Germany	500	1991, 1993–98	Globalization and SME 1997 (OECD), Fourth European Conference paper
Ghana	200	90s	Regional Program on Enterprise Development Paper # 106, #109
Greece	500	1988	OECD
Guatemala	200*	1990	Inter-American Development Bank-SME Observatory
Honduras	150	1990	Inter-American Development Bank-SME Observatory
Hong Kong, China	100	1993, 2000	APEC Survey, Legislative Council 17 Jan 2005
Hungary	250	1997	United Nation Economic Commission for Europe
Iceland	100	1996	Eurostat Database
Indonesia	100	1993	OECD Paper, Speech of State Minister of Cooperatives and SME in Indonesia
Ireland	500	1997	Globalization and SME 1997 (OECD)
Italy	200	1995	Russian SME Resource Center, Eurostat Database
Japan	300	1991, 1994, 1996, 1998, 1999	Globalization and SME 1997 (OECD), SME Agency in Japan
Kazakhstan	500*	1994	United Nation Economic Commission for Europe
Kenya	200	90s	Regional Program on Enterprise Development Paper # 106, #109
Korea, Rep.	300	1992–93, 1997, 1999	APEC Survey, OECD, Paper titled "Bank Loans to Micro-enterprises, SMEs and Poor Households in Korea"
Kyrgyz Republic	250*	1996–97	United Nation Economic Commission for Europe
Latvia	500*	1994–95	United Nation Economic Commission for Europe
Luxembourg	250*	1996	Eurostat Database
Mexico	250	1990–97	Inter-American Development Bank-SME Observatory, APEC Survey
Netherlands	100	1991–98	G8 Global Marketplace for SME, Globalization and SME 1997(OECD)
New Zealand	100*	1991, 1998–00	SMEs in New Zealand, Structure and Dynamics, APEC Survey
Nicaragua	100	1992	Inter-American Development Bank-SME Observatory
Nigeria	200	2000	Regional Program on Enterprise Development Paper # 118
Norway	100	1994, 1990	European Industrial Relations Observatory
Panama	200	1992	Inter-American Development Bank-SME Observatory
Peru	200	1994	Inter-American Development Bank-SME Observatory
Philippines	200	1993–95	APEC Survey, Situation Analysis of SME in Laguna
Poland	250	1996–97, 1999	United Nation Economic Commission for Europe
Portugal	500	1991, 1995	OECD
Romania	250	1996–1999	United Nation Economic Commission for Europe, Center for International Private Enterprise
Russian Federation	250*	1996–97	United Nation Economic Commission for Europe
Yugoslavia Fed. Rep.	250*	1999	Center for International Private Enterprise
Singapore	100	1991, 1993	APEC Survey
Slovak Republic	500	1994–95	United Nations Economic Commission for Europe
Slovenia	500*	1994–95	United Nations Economic Commission for Europe, SME in Central and Eastern Europe, Barriers and Solution by F. Welter
South Africa	100	1988	World Bank Report

TABLE II
Continued

Country	Official Definition of SME	Time Period of Data	Source
Spain	500	1991, 1995	OECD
Sweden	200	1991, 1996	OECD
Switzerland	500*	1991, 1995, 1996	OECD
Taiwan	200	1993	APEC Survey
Tajikistan	500*	1994, 1995	United Nations Economic Commission for Europe
Tanzania	200	90s	Regional Program on Enterprise Development Paper # 106, #109
Thailand	200	1991, 1993	APEC Survey
Turkey	200*	1992, 1997	SME in Turkey
Ukraine	250*	1996	United Nations Economic Commission for Europe
United Kingdom	250*	1994, 1996–00	Department of Trade and Industry, UK
United States	500	1990–1998	Statistics of US Businesses: Microdata and Tables
Vietnam	200	1995	Nomura Research Institute Papers
Zambia	200	90s	Regional Program on Enterprise Development Paper # 106, # 109
Zimbabwe	200	90s	Regional Program on Enterprise Development Paper # 106, #109

*Indicates either the country has no official definition of SME or we don't have data for the country's official cut off for SME.

Notes

[1] The Challenge, World Bank Review of Small Business Activities, 2001.

[2] IFC Country Reports on Indonesia, Thailand, and Tajikistan to name a few.

[3] Previous efforts include Snodgrass and Biggs (1996) and Klapper and Sulla (2002).

[4] Currently the SME Department of the World Bank works with the following definitions: Micro enterprise-up to 10 employees, total assets of up to $10,000 and total annual sales of up to $100,000; Small enterprise – up to 50 employees, total assets and total sales of up to $3 million; Medium enterprise – up to 300 employees, total assets and total sales of up to $15 million.

[5] The source for our data on the African Countries defines an SME to be less than 200 employees and for Japan, the cut-off used is 300 employees.

[6] The choice of source in this case depended largely on the source used for similar countries and was usually one of the following five main sources: The Inter-American Development Bank's SME Observatory, United Nations European Economic Commission, OECD: Globalization and SME Synthesis Report, The APEC Survey on SMEs and the World Bank Regional Program on Enterprise Development Survey.

[7] We also explored a sample using up to 150 employees or less as a cut-off. However, we could only collect information for 31 countries and the variation of the actual cut-offs was very high, with some countries reporting figures for cut-offs as low as 10 or 25 employees and others with cut-offs of 100 or 150 employees.

[8] The data are available at: http://www.worldbank.org/research/projects/sme/SME_database.xls

[9] We also constructed a series of the relative importance of SMEs in GDP using the 250 employee cut-off. However, we could obtain data for only six countries.

[10] This result contradicts anecdotal evidence and earlier empirical figures in Snodgrass and Biggs (1996) who report that the SME share in employment reduces with GNP per capita. Their finding is based on census data from 34 countries in the 1960s and 1970s and they define SMEs to have less than 100 employees. The reason for the discrepancy between our results and theirs could be the smaller sample or the lower employment cut-off for the SME definition used in their study. We cannot check the results using their sample because they do not report the countries for which census data were available. However, when we use our limited data for SME150, we find that its correlation with GDP per capita is no longer significant although the positive sign remains.

[11] We do not present results with SME_GDP and INFORMAL, given the small number of observations.

[12] The original application of this methodology was in quantitative genetics to decompose variation in traits into a genetic components and an environment component (Jinks and Fulker, 1970). The methodology has been extensively used in the corporate strategy literature in the context of decomposing profitability into corporate and industry effects (Schmalensee, 1985; Rumelt, 1991; McGahan and Porter, 1997, 2002; Khanna and Rivkin, 2001).

[13] The contribution of various country level indicators to the variation in the SME sector can be determined using either the regression based ANOVA approach as described here or through a components of variance approach as described in Searle (1971) where we can decompose the variation in SME sector into two variance components – a

country effect component and a residual component. Our results are consistent in both approaches.

[14] While these results are clearly weaker, we cannot rule them out completely since the fit of our IV regressions are poorer for these specifications.

[15] We also tried regressions where we included all business environment indicators simultaneously. Since the indicators have to share the same instruments, not surprisingly, none of them entered significantly, with the notable exception of credit information sharing, which entered positively and significantly in the SME250 regression when controlling for other dimensions of the business environment.

References

Ayyagari, M., A. Demirguc-Kunt and V. Maksimovic, 2006, 'How Well Do Institutional Theories Explain Firms' Perceptions of Property Rights? *Review of Financial Studies*, forthcoming.

Beck, T., A. Demirguc-Kunt and R. Levine, 2003, 'Law, Endowments and Finance', *Journal of Financial Economics* **70**(2), 137–181.

Beck, T., A. Demirguc-Kunt and R. Levine, 2005a, 'SMEs, Growth, and Poverty: Cross-Country Evidence', *Journal of Economic Growth* **10**, 199–229.

Beck, T., A. Demirgüç-Kunt and V. Maksimovic, 2005b, 'Financial and Legal Constraints to Firm Growth: Does Firm Size Matter', *Journal of Finance* **60**, 137–179.

Botero, J., S. Djankov, R. La Porta, F. Lopez-de-Silanes and A. Shleifer, 2004, 'The Regulation of Labor', *Quarterly Journal of Economics* **119**(4), 1339–1382.

Djankov, S., O. Hart, T. Nenova and A. Shleifer, 2003a, 'Efficiency in Bankruptcy', Working Paper Department of Economics, Harvard University, Cambridge, Mass.

Djankov, S., R. La Porta, F. Lopez-de-Silanes and A. Shleifer, 2003b, 'Courts', *Quarterly Journal of Economics* **118**, 453–517.

Djankov, S., R. La Porta, F. Lopez-de-Silanes and A. Shleifer, 2002, 'The Regulation of Entry', *Quarterly Journal of Economics* **117**, 1–37.

Djankov, S., F. Martin and C. McLiesh, 2004, 'Property', World Bank Research Project.

Djankov, S., C. McLiesh and A. Shleifer, 2006, 'Private Credit in 129 Countries', *Journal of Financial Economics*, forthcoming.

Easterly, W. and R. Levine, 1997, 'Africa's Growth Tragedy: Policies and Ethnic Divisions', *Quarterly Journal of Economics* **112**, 1203–1250.

Friedman, E., S. Johnson, D. Kaufmann and P. Z. Lobaton, 2000, 'Dodging the Grabbing Hand: The Determinants of Unofficial Activity in 69 Countries', *Journal of Public Economics* **76**, 459–493.

Hallberg, K., 2001, 'A Market-Oriented Strategy for Small and Medium-Scale Enterprises', IFC Discussion Paper #48.

Jinks, J. L. and D. W. Fulker, 1970, 'Comparison of the Biometrical Genetical, MAVA, and Classical Approaches to the Analysis of Human Behavior', *Psychological Bulletin* **73**, 311–349.

Khanna, T. and J. Rivkin, 2001, 'Estimating the Performance Effects of Business Groups in Emerging Markets', *Strategic Management Journal* **22**(1), 45–74.

Klapper, L. and V. Sulla, 2002, 'SMEs Around the World: Where Do they Matter?' World Bank Mimeo.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer and R. Vishny, 1999, 'The Quality of Government', *Journal of Law, Economics and Organization* **15**, 222–279.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer and R. Vishny, 1998, 'Law and Finance', *Journal of Political Economy* **106**, 1113–1155.

McGahan, A. M. and M. E. Porter, 1997, 'How Much Does Industry Matter, Really?' *Strategic Management Journal* **18**, 15–30.

McGahan, A. M. and M. E. Porter, 2002, 'What Do We Know About Variance in Accounting Profitability?' *Management Science* **48**(7), 834–851.

Rumelt, R., 1991, 'How Much Does Industry Matter?' *Strategic Management Journal* **12**(3), 167–185.

Schmalensee, R., 1985, 'Do Markets Differ Much?' *American Economic Review* **75**(3), 341–351.

Schneider, F., 2000, The Size and Development of the Shadow Economies and Shadow Economy Labor Force of 18 Asian and 21 OECD Countries: First Results for the 90s.

Schneider, F. and D. Enste, 1998, Increasing Shadow Economies All Over the Wworld-Fiction or Reality: A Survey of the Global Evidence of Its Size and of Its Impact from 1970 to 1995: IMF and University of Linz, August 21.

Searle, S., 1971, *Linear Models*, New York, NY: John Wiley & Sons, Inc.

Snodgrass, D. and T. Biggs, 1996, 'Industrialization and the Small Firm', International Center for Economic Growth.

Stulz, R., A. Karolyi and C. Doidge, 2004, 'Why Do Countries Matter So Much for Corporate Governance?' NBER Working Paper No. 10726.

Stulz, R. and R. Williamson, 2003, 'Culture, Openness and Finance', *Journal of Finance* **70**(3), 313–349.