

Krakowski, Michael

**Working Paper**

## Determinants of the Informal Economy: The Importance of Regional Factors

HWWA Discussion Paper, No. 313

**Provided in Cooperation with:**

Hamburgisches Welt-Wirtschafts-Archiv (HWWA)

Suggested Citation: Krakowski, Michael (2005) : Determinants of the Informal Economy: The Importance of Regional Factors, HWWA Discussion Paper, No. 313, Hamburg Institute of International Economics (HWWA), Hamburg

This Version is available at:

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Hamburg Institute of International Economics

**2005**

ISSN 1616-4814

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# **HWWA Discussion Paper**

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**Michael Krakowski**

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This paper was prepared within the HWWA Research Programme “Trade and Development”.

Edited by the Department World Economy

# Determinants of the Informal Economy: The Importance of Regional Factors

## ABSTRACT

This paper analyses the determinants of the size of the informal economy using cross-country regressions. Two sets of global data using indirect estimation techniques and the perception of business leaders for 109 countries as well as a regional set for Latin America based on direct data are used to estimate the size of the informal economies. Indirect estimation techniques arrive at higher estimates of the size of the informal economy than the perceptions of business leaders because they include not only the (fundamentally legal) activities of the informal sector, but also those activities which are illegal per se. Both kinds of estimate show strong regional differences in the size of the informal economies. Regressions on a set of indicators covering the intensity of regulations, taxes and the cost of establishing a business reveal that the intensity of labour regulations seems to be the most important factor in explaining the size of the informal economy in cross-country regressions using the rational behaviour approach. Socio-cultural indicators are only important in explaining the size of the informal economies in Latin America. Government efficiency is an important factor in explaining the size of the informal economy in world regressions. Regional regressions reveal that different aspects of governance dominate the relationship between government efficiency and the size of the informal economy in the different regions. Governments that seek to limit or decrease the size of the informal economy must therefore start from a country-specific analysis of the reasons why economic agents choose to conduct their business in the informal sector.

**JEL classification:** O17, H26

**Key words:** informal sector, tax evasion, business regulation

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## 1. Introduction

Most of the literature on the informal economy in the past has focused on industrialised countries. In general the findings point to an increasing share of the informal economy in the industrialised economies, supposedly due to increasing taxes and regulations during most of the post war period.<sup>1</sup> A lack of estimations has limited and continues to limit time series analysis to a small set of countries.

For policy makers, information on the size of the informal economy and its possible causes is of considerable importance. For example, in some industrialised countries the observed trend towards ever-increasing unemployment rates could be due to an increasing number of people working in the underground economy. If this were the case, conventional employment policies cannot be expected to increase measured employment in the formal sector or at least not in the same way as would be the case without people working in the clandestine economy. Or, if the size of the underground economy is related to overall tax rates, tax increases may not have the expected results, but only increase the size of the informal economy and so reduce the tax base and tax receipts. In countries or regions with a large informal sector the effective management of the economy by the state may be undermined.

When the economic consequences of the informal sector are discussed, two types of comparisons are used, though sometimes it is not made clear which type is being applied. Some compare an economy that has a significant informal sector with an economy where the informal sector has vanished without having been transferred to the formal economy. The overall economy is then smaller than before. It is not surprising that in this kind of comparison the informal economy is beneficial for growth. This is the kind of comparison used when it is stated that a positive side-effect of the informal economy is “...that over 66 percent of earnings in the shadow economy are immediately spent in the official sector” (Schneider and Ernste, 2000, p.89).

A second way to assess the consequences of the informal sector is to compare an economy that has a large informal sector with one of the same overall size, but where the shadow economy is smaller. In many respects, a large informal economy is not beneficial for growth when compared with a situation where the shadow economy is formalised. For example,

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<sup>1</sup> For a recent survey see Schneider and Ernste.

while people working in the hidden economy benefit from public infrastructure, such as streets, they do not contribute to its financing. Reducing the size of the informal sector could lead to a broader tax base and thus open up the possibility of lowering overall tax rates or improving public services; both may be considered positive outcomes that could improve the growth prospects of the economy in question.<sup>2</sup>

Some authors nevertheless stress that a large informal economy may not be bad for economic development, because within this sector particularly dynamic entrepreneurs can develop markets without the hindrance of bureaucratic regulations, and maybe these businesses will later become part of the formal economy (Soto, Fleming p.396). This reasoning has been applied mainly to developing and transition countries with especially high levels of bureaucracy and poor overall governance. It is implicitly assumed that because of the inferior quality of the institutional environment, activities carried out in the shadow economy could not be transferred to the formal sector.

Nevertheless, in many developing countries the informal sector is considered a hindrance for economic growth and improving economic policies. The prevailing economic philosophy today requires that governments should provide sufficient services - especially in the education and health sectors - in order to create pro-poor growth, without relying too strongly on debt financing. Consequently, many (developing) countries focus on increasing tax receipts. This is difficult if a large informal economy exists. Diminishing the informal economy, expanding the tax base and thus increasing tax income is the virtuous circle many governments in developing countries are looking for. For economic policy makers it is therefore important to know the size of the informal economy and to what extent it may be affected by economic policy variables.

Various papers using cross – country comparisons in the past tried to assess the relative importance of policy variables in explaining the size of the informal sector (for example Simon Johnson, 1998; Eric Friedman et al. 2000) with more limited data sets. This paper tries to assess the influence of a number of policy variables using a data set for 109 countries from different regions. This more complete data set allows for the analysis of regional factors. And new estimates of the informal sectors in developing countries and new data from the World

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<sup>2</sup> Or in Tanzi's words: "there cannot be any question that the underground economy is a real phenomenon with important implications that deserve attention and study" (Tanzi, 1999, p. 338).

Bank on policy and governance variables allow for a much more comprehensive investigation of the influence of different policies on the size of the informal sector than before.

**2. Types and definitions of activities within the hidden economy**

Not all activities within a hidden economy may be transferred to the formal sector, for example activities connected with illegal drugs. Table 1 provides a taxonomy of activities related to the hidden economy. Analysis of the influence of policy variables on the size of the informal economy focuses on activities which are hidden in order to evade taxes or other regulations (labour standards, business start-up regulations etc.), but which are not illegal per se. In other words, no change in tax or regulatory policy would bring the illegal activities mentioned in Table 1 to the surface; the policy goal here is to make them vanish. Also, commonplace legal non-market economic activities like self-help or neighbourly help are not generally the objective of policy actions either. A policy which aims at broadening the tax base mainly tackles the tax-evading clandestine practise of otherwise legal economic activities as described in Table 1.

Table 1 Types of hidden economic activities

	Monetary Transactions		Nonmonetary Transactions	
Illegal Activities	Trade in stolen goods; drug dealing and manufacturing; prostitution; gambling; smuggling and fraud.		Barter: drugs, stolen goods, smuggling, etc. Producing or growing drugs for own use. Theft for own use.	
	Tax Evasion	Tax Avoidance	Tax Evasion	Tax Avoidance
Legal Activities	Unreported income; activities from self-employment; wages, salaries and assets from unreported work related to legal services and goods.	Employee discounts, fringe benefits	Barter of legal services and goods	All do-it-yourself work and neighbourly help

Source: Schneider, Ernste

While this taxonomy of hidden economic activities may be applied to all types of economies, reality in many developing countries differs from that in industrialised countries. To a certain extent, for example, legal non-reported activity in some of the developing countries may not



necessarily be the product of conscious choices by the economic agents involved, but of illiteracy or a remote geographic location that make compliance with tax rules or other regulations very difficult, even if these legal requirements are known to the economic agents, which is not always the case. In some countries this leads to a perception that there is a traditional low productivity sector, where compliance with the rules is quite difficult or even impossible, and a so-called modern sector, where the rules should be applied. People working in the traditional sector may be less well educated than people working in the modern sector or may be members of ethnic minorities. The reasoning here is that changes in the rules - regarding for example lower tax rates - would have little or no influence on the size of the so defined (traditional) informal sector.

This approach differs from the so-called rational behaviour approach, where it is assumed that economic agents choose between the formal and informal sectors according to their respective costs and benefits. Costs of working in the formal sector consist of the burden of complying with regulations and taxes, while benefits are derived from the effective legal system - for example with regard to the enforcement of contracts.<sup>3</sup>

The theory of rational behaviour for explaining the size of the informal economy focuses in general on the disincentives for participating in the formal sector. These disincentives may be taxes, social security contributions, labour laws, or the red tape and costs of formalising an economic activity. Various studies claim there is a positive correlation between the level of marginal tax rates and the intensity of regulation on the one hand, and the relative size of the informal economy on the other (for example Loayza 1997). A typical company operating in the informal economy does not pay taxes, does not comply with existing labour regulations and is not legally established. Therefore it can be expected that the informal economy represents a high percentage of total economic activity in countries where tax rates, labour regulation intensity and business formalisation costs are high as well. However, an approach that only focuses on the disincentives of participating in the formal economy neglects that there are also advantages of participating in the formal sector, primarily with regard to legal protection for the economic activity in question. This covers the ability to conclude legally enforceable agreements with suppliers and customers, but also includes access to new or lower-cost sources of financing. Such legal protection is worth more in an environment where it is effective without having to pay extra money for it - for example because of widespread

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<sup>3</sup> Jansson and Chalmers (2001) provide an overview about cost and benefits of formalisation.

corruption. In economies with a strong legal system, therefore, the size of the informal economy should be smaller than in economies with weak rule of law.

Throughout this paper the expressions informal economy or informal sector are used for legal activities conducted in such a way as to evade taxes or other regulations. Non-market or illegal activities are not the subject of this investigation. The expression “hidden economy” includes per se illegal activities and legal activities conducted in such a way as to evade taxes or other regulations. The hidden economy therefore is larger than the informal economy.

### **3. Measuring the informal sector**

Most of the existing methods for assessing the size of the hidden economy focus on the informal sector, but not all are suitable for differentiating between different types of activities within the hidden economy. Three different approaches for measuring the size of the hidden economy may be distinguished: indirect estimation methods, direct estimation methods and the perceptions of informed economic agents.

Indirect estimation methods are the most widely used approach for estimating the extent of the hidden economy. Empirical investigations based on *electricity consumption* (for example Lizzeri, Portes) assume that electricity consumption is a good indicator for overall economic activity. An observed difference between GDP growth and that of electricity consumption is then attributed to an increase in the size of the hidden economy. This approach cannot of course distinguish between electricity consumption in the informal sector and that in a per se illegal activity such as the processing of coca to make cocaine for example.

The *currency demand* approach (for example Cagan 1958, Tanzi 1983) assumes that shadow transactions are undertaken in the form of cash payments, therefore increasing the demand for money. An excessive increase in currency is then attributed to growth of the informal economy. Estimates of the extent of the informal economy derived by this approach assume that the entire hidden economy is a consequence of tax evasion, again not distinguishing between different activities within the hidden economy.

MIMIC (multiple indicators, multiple causes) models apply a factor analytic approach that is used to measure the underground economy as an unobserved variable over time. Indicators for the underground economy usually include monetary indicators and labour participation rates

(for example Giles 1999). Again, studies using this approach do not differentiate between different aspects of the hidden economy. If one of the typical outcomes of the empirical investigations mentioned for example by Giles is “that the size of the hidden economy has been growing .. over the past two or three decades, in almost all of the countries for which comparative data have been assembled” (Giles 1999, p. 370), it would be interesting to know if this reflects for example growing drug consumption and thus illegal activities, or more unregistered work in order to evade taxes. The indirect estimation methods used in the literature cannot distinguish between these two possibilities and are therefore of limited use for policy recommendations.

Direct estimation methods concentrate on the informal part of the hidden economy. One estimation technique is based on the results of tax audits (for example Feinstein 1999). This approach allows for a direct estimation of what may be understood by the informal economy, and these results should be sensitive to tax and regulatory policies. Of course only registered taxpayers can be audited, and this approach is not feasible in most of the developing countries where most of the participants in legal activities within the informal economy are not registered. Direct data can also be obtained by household surveys, which are conducted in many developing countries with the help of the World Bank.

Another way of estimating the informal economy consists of asking for the perceptions of well-informed persons. The World Economic Forum for example asks in its poll of business leaders for the size of the “unofficial or unregistered” part of economic activity in a country, aiming at the informal sector and not at illegal activities (WEF). Because these estimates should not include illegal activities, their results should be lower than those of the indirect estimation techniques mentioned above.

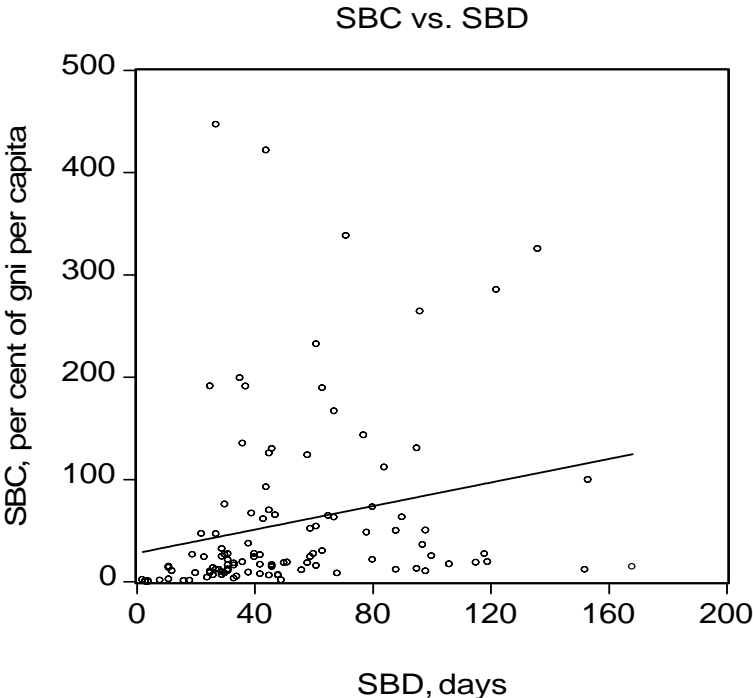
#### **4. Hypothesis**

The rational behaviour hypothesis for the explanation of the size of the informal economy implies that factors affecting the comparative costs (or benefits) of economic activities in the informal sector (compared to activities in the formal sector) would bear upon the relative size of the informal economy. The costs of economic activities within the formal sector (as compared to the informal sector) consist of the costs of regulation by the state. The comparative costs of an enterprise working in the formal part of the economy compared to

one working in the informal part may be divided into initial registration and ongoing compliance costs.

The monetary cost and the time necessary for *commercial registration*<sup>4</sup> vary substantially between different economies. In some of the developing countries these costs are quite high compared to per capita income, and the registration process may be extremely protracted and burdensome. Chart 1 shows the distribution of the cost of commercial registration (SBC, per cent of GNI per capita) and the duration of the registration process (SBD, days). These two dimensions of the commercial registration process do not seem to be strongly correlated.

Chart 1: Cost and duration of starting a business



Business enterprises are typically required to pay a wide variety of *taxes*. The most common forms of taxation are income or corporate taxes and sales or value-added taxes. If an economic activity switches to the informal sector and stops paying taxes this constitutes a gain for the respective enterprise. Another important, but in empirical studies often neglected aspect, of formal sector regulation are *labour standards*. Even in many developing countries labour standards represent important costs and may encourage corruption.

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<sup>4</sup> Operational permits and licenses, which are normally required by the municipalities and are primarily an initial obligation, may represent an important part of the costs and duration of the business registration process. The cost and duration of general permits and licenses are here included in the cost and duration of commercial registration (SBC, SBD). Activity-specific permits and licenses are of course not included and could be analysed in a sector-specific comparison.

Evasion of taxes, operating a business without due registration, and non-compliance with labour regulation of course constitute illegal behaviour and detection may result in penalties or even the closing of the respective business. These are costs that enterprises working in the informal part of the economy may eventually have to pay; the probability of payment is assumed to depend on overall government effectiveness.

As already mentioned, the advantages of working in the formal part of the economy consist, inter alia, of the

- ability to conclude legally enforceable agreements with suppliers and customers,
- access to trade fairs and export opportunities,
- access to new or lower-cost sources of financing,
- ability to limit personal liability, and
- access to government support programmes.

The value of these advantages depends on the effectiveness of the rule of law in a country. If, because of a badly functioning legal system, agreements with suppliers and customers are not really enforceable anyway, the incentive to remain in the formal economy is low.

New economic agents therefore choose to work in the informal part of the economy if

$$SBC + SBD \cdot OC + \sum_{t=0}^{t=\infty} \{(TAX_t + COLR_t)/(1+i)^t\} > \sum_{t=0}^{t=\infty} \{(PD \cdot PEN + ADV)/(1+i)^t\}$$

$$PD = f(GE)$$

$$ADV = f(ROL)$$

The following abbreviations are used in this context:

IE = % informal economy of GNI

SBC = starting business cost

SBD = starting business duration (days)

OC = opportunity cost of starting business duration per day

TAX = taxes

COLR = cost of labour regulation

PD = probability of detection per year

PEN = penalty in case of detection

ADV = advantage of working in the formal sector

GE = government effectiveness

ROL = rule of law

i = real interest rate

The proportion of economic activity in the informal economy is therefore expected to be higher with increasing SBC, SBD, TAX, SSC, COLR and decreasing GE, ROL and PEN. PEN, OC and i are assumed to be equal throughout the country sample. This gives the following equation for estimation:

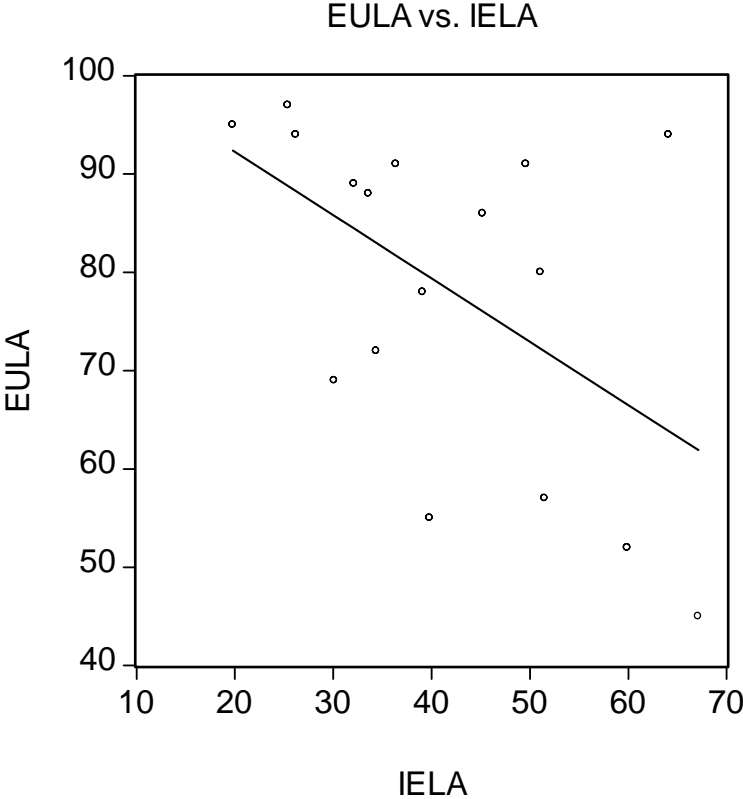
$$(1) \text{ ie} = \beta_0 + \beta_1 \text{ SBC} + \beta_2 \text{ SBD} + \beta_3 \text{ TAX} + \beta_4 \text{ COLR} + \beta_5 \text{ GE} + \beta_6 \text{ ROL} + \varepsilon$$

whereby it would be expected:

$$\beta_1, \beta_2, \beta_3, \beta_4 > 0, \beta_5, \beta_6 < 0$$

Equation (1) is based on the rational behaviour hypothesis. The aforementioned distinction between a modern and a traditional sector in developing countries nevertheless hints at the possibility that socio-cultural factors may help to explain the size of informal economies. For example there is a general perception in Latin America that most of the economic agents working in the informal sector are indigenous people. Chart 2 shows the relationship between relative sizes of the non-indigenous population and the informal economy in Latin America (EULA, indicator ethnic uniformity in Latin America). A higher share of the indigenous population (lower EULA) seems to be related to a higher share of the informal economy (IELA, informal economy in Latin America). Maybe other regions also have an ethnic group which dominates the formal market, whereas other ethnic groups are confined to low productivity jobs in the informal market. Consequently, two indicators are constructed in order to measure socio-cultural uniformity. One indicator is the simple share of the dominant ethnic group in a country's total population (EU, ethnic uniformity), the other one is the product of the share of the dominant ethnic group and the share of the dominant religion (ERU, ethnic and religious uniformity); both indicators are scaled in such a way that 100 represents total uniformity and the lower the value the higher the diversity.

Chart 2: Ethnic uniformity and the size of the informal sector in Latin America



An examination of the data on the size of the informal economy reveals pronounced regional differences. Generally speaking the informal economy as a percentage of GDP is largest in Latin America (LA), followed by the African (AF) and transition countries (TR). The smallest informal sectors are found in the industrialised countries (see table 1).

As aforementioned, indirect estimates do not only measure the informal economy but include also per se illegal activities and therefore estimate what in this paper is called the hidden economy. The abbreviation IE in the following is used for these indirect estimates. If business leaders in the respective country are asked “What percentage of business in your country would you guess is unofficial or unregistered”, an indicator of perception of the size of the informal economy may be constructed, which does not include the per se illegal activities (IEPER, informal economy perception). The relative differences between the perception of the size of the informal economy and the indirect estimates used in this paper are especially important in the industrialised countries; the sequence of regional averages

remains the same if estimated by the perceptions of economic agents or Schneider's approach (see Table 2).

Table 2: Regional differences in the size of the informal economy

	mean IE (1999/2000)	mean IEPER (2003)	relative absolute difference
Industrialised Countries IC	17.20	8.79	0.49
Asian Countries AS	26.08	19.88	0.42
Transition Countries TR	38.32	23.06	0.27
African Countries AF	41.21	31.40	0.27
Latin American Countries LA	41.49	35.56	0.26

These regional differences may partly reflect differences in economic development. Maybe developed countries can contain their informal economies better than less developed ones, because the so-called traditional sector is negligible. Or regional differences could reflect the overall efficiency of governments in the enforcement of regulations and criminal law, which for historical and cultural reasons may differ from region to region.

The discussion of the possible influence of socio-cultural and regional factors leads to the inclusion of the aforementioned variables in the regression estimation:

$$(2) \text{ ie} = \beta_0 + \beta_1 \text{SBC} + \beta_2 \text{SBD} + \beta_3 \text{TAX} + \beta_4 \text{COLR} + \beta_5 \text{GE} + \beta_6 \text{ROL} + \beta_7 \text{EU} + \beta_8 \text{GDPPC} \\ + \beta_9 \text{AS} + \beta_{10} \text{TR} + \beta_{11} \text{LA} + \beta_{12} \text{IC} + \varepsilon$$

$$\beta_1, \beta_2, \beta_3, \beta_4 > 0, \beta_5, \beta_6, \beta_7, \beta_8 < 0$$

## 5. The data

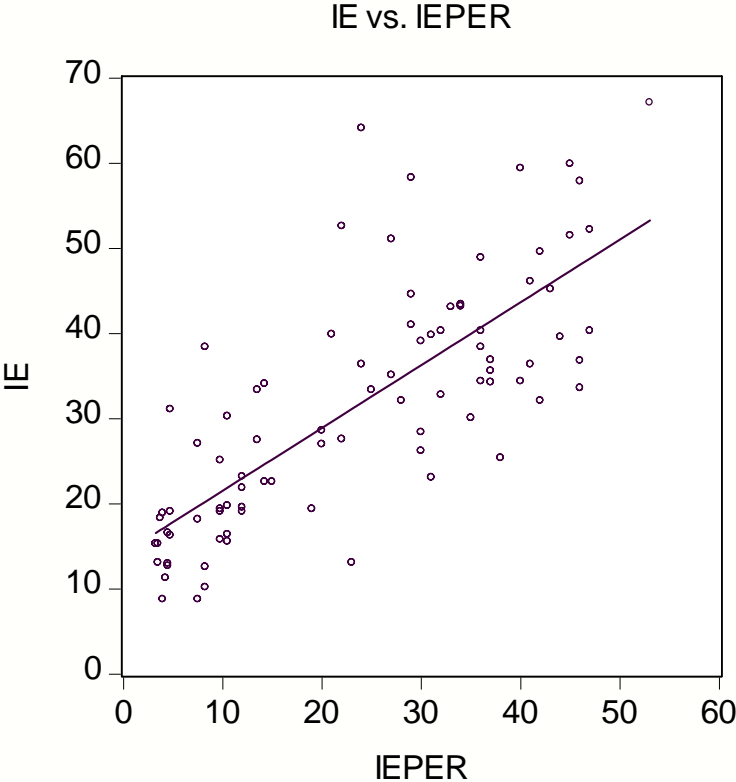
As far as estimations of hidden economies are concerned, the most complete set of international data available using indirect estimation techniques is that presented by Schneider (Schneider, 2002). He reports estimates for 109 countries, based mainly on the demand for money approach. This data is also used in this study (IE). With regard to the perception method, the World Economic Forum for example - aiming at the informal sector and not at illegal activities - asks in its poll of business leaders in 102 countries "What percentage of business in your country would you guess are is unofficial or unregistered?" (Sala-i-Martin 2004). This is referred to in this paper as the perception index.



Data collated by the Economic Commission for Latin America and the Caribbean (ECLAC) regarding the urban population employed in low productivity sectors in Latin America is used for Latin American regional regressions to reflect the size of informal economy in this region (this data is called here SI). Data is derived from direct estimation techniques (household surveys). This measure draws on the discussion of “traditional” and “modern” sectors in these countries. Detailed country analysis shows that in general this sector is composed of family enterprises which avoid the legal requirements of regulations for employees and do not pay taxes or are part of special tax regimes (for example Krakowski 2004).

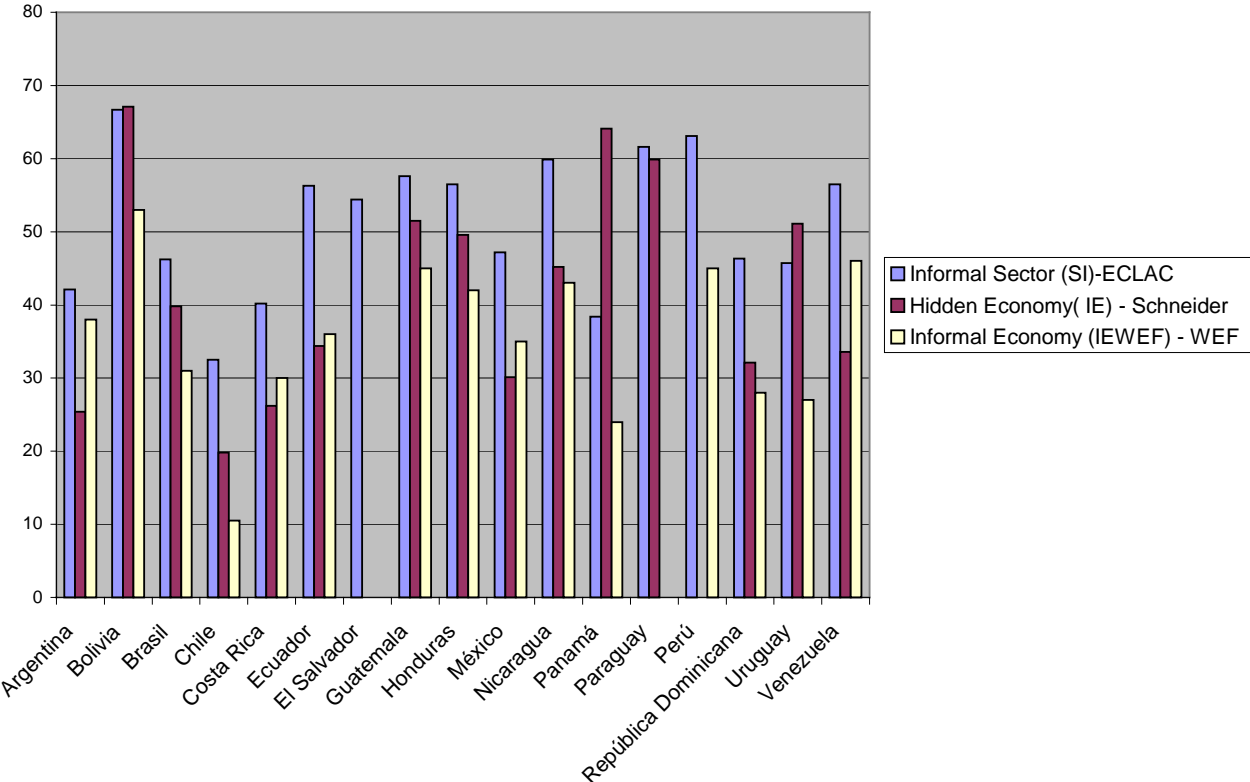
Chart 3 compares Schneider's data for the hidden economy (IE) with the WEF data on the perception of the informal economy (IEPER). As expected, the IE data (mean=31.60) is significantly higher than the IEPER data (mean=23.47, common sample). Chart 4 compares the results of the aforementioned estimates for Latin American countries. Results from the household surveys are the highest (mean=49.43), perceptions of the informal economy are the lowest (mean=34.89, ie mean=40.71, common sample).

Chart 3: Indirect estimates and perceptions of the size of the informal economy



The high level of the estimates of the household survey data reflects the definition of the informal economy in this data. Low productivity activities in the urban sectors are taken as an approximation for the informal economy, not all of which are activities that do not pay taxes or are not legally established. Nevertheless, as a general rule these activities in the Latin American environment take place within a special tax regime and are subject to much lower taxes than the higher productivity activities in the conventional tax regime. The numbers reflect shares of total employment and thus do not measure any percentage of GDP, as do the IE and IEPER indicators. As the data for SI derived from household survey data are defined as low productivity activities, the share of employment is obviously higher than the share of GDP represented by these activities. Therefore estimates for IE and IEPER should be lower than SI estimates.

Chart 4: Estimates of the informal economy for 17 Latin American countries (%)



The difference between the estimates made by the indirect and the perception approaches are greatest in Panamá. It is not surprising that, in an off-shore centre with significant money laundering activities, the demand for money technique used for estimating IE mainly reflects other factors than the informal economy, thus highlighting the problems of this estimation procedure.

New data collated by the World Bank allows for a direct investigation of the relevance of some of the topics mentioned above. The "Doing Business Indicators" provide data for the cost (SBC) and duration (SBD) of legalising an economic activity. A data set by Juan Botero et al.(2004) measures different aspects of labour legislation, which here are aggregated to one index for labour regulation intensity (LAB). For the tax regime, an index drawn up by the Heritage foundation is used which combines marginal personal and company tax rates as well as a measure of the change in the fiscal balance in order to approximate expectations of future changes in tax rates (FBHE).<sup>5</sup>

A set of governance indicators is included in order to estimate the gain achieved through formalisation. Here the Kaufmann-Kraay-Zoido-Lobatón dataset is used. They provide data for 160 countries on "Voice and Accountability", "Political Stability", "Government Effectiveness", "Regulatory Quality", "Rule of Law" and "Control of Corruption", derived from several surveys.

- "Voice and Accountability" (VA) includes a number of indicators measuring various aspects of the political process, civil liberties and political rights.
- "Political Stability" (PS) combines several indicators which measure perceptions of the likelihood that the government in power will be destabilised or overthrown by possibly unconstitutional and/or violent means, including terrorism.
- "Government Effectiveness" (GE) combines perceptions of the quality of public service provision, the quality of the bureaucracy, the competence of civil servants, the independence of the civil service from political pressures, and the credibility of the government's commitment to policies into a single grouping.
- "Regulatory Quality" (RQ) includes measures of the incidence of market-unfriendly policies such as price controls or inadequate bank supervision, as well as perceptions of the burdens imposed by excessive regulation in areas such as foreign trade and business development.
- "Rule of Law" (ROL) includes several indicators which measure the extent to which agents have confidence in and abide by the rules of society. These include perceptions of the incidence of both violent and non-violent crime, the effectiveness and predictability of the judiciary, and the enforceability of contracts.

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<sup>5</sup> For data description see Appendix "The data".

- “Control of Corruption” (COC) measures perceptions of corruption, conventionally defined as the "exercise of public power for private gain" model (Kaufmann, Kraay, Zoido-Lobaton 2002, p. 8-9).

The data is aggregated using an unobserved components model (Kaufmann, Kraay, Zoido-Lobaton 1999)<sup>6</sup>.

## 6. Estimation results

### *Estimates for determinants of the size of the informal economy*

As the share of the informal economy is a fraction, a log-odds function is used for estimation (Kennedy 2003, p. 124). Of the governance variables, which are strongly correlated, only government effectiveness is included in the regressions. Independent variables with the exception of the regional ones are scaled to multiples of standard deviations. This results in the following equation for estimation:

$$(3) \ln(\text{ie}/1-\text{ie}) = \beta_0 + \beta_1 \text{sbc} + \beta_2 \text{sbd} + \beta_3 \text{fbhe} + \beta_4 \text{lab} + \beta_5 \text{ge} + \beta_6 \text{eu} + \beta_{7...10} \text{REGIONS} + \varepsilon$$

$$\beta_1, \beta_2, \beta_3, \beta_4 > 0, \beta_5, \beta_6 < 0$$

In some of the estimations GNP per capita is included as an additional control variable.

The results of the regressions in table 3 show that labour regulations significantly influence the size of the hidden economy; in all regressions the influence is significant at the 1% level with the expected (positive) sign: i.e. higher inflexibility in labour regulations is associated with a larger hidden economy. A strongly significant influence is also shown with regard to the index for government effectiveness; in other words more efficient government reduces the relative size of the hidden economy. This may occur through a better rule of law, thus increasing the advantages of working in the formal sector, and/or a higher probability of detection for enterprises working in the hidden economy. The variable for duration of starting a business shows a significant influence on the size of the informal economy, but the wrong sign.

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<sup>6</sup> "We use an unobserved components model which expresses the observed data in each cluster as a linear function of the unobserved common component of governance, plus a disturbance term capturing perception errors and/or sampling variation in each indicator." p. 7.

Table 3: Regressions on indirect estimates of the informal economy

Independent variable	Dependent variable IELOGODDS		
	White Heteroskedasticity-Consistent Standard Errors & Covariance		
constant	-0.896864*** (-4.749534)	-0.023445 (-0.073111)	-0.851844** (-2.420896)
SBC		-0.017530 (-0.457327)	-0.001605 (-0.027624)
SBD		-0.143162*** (-2.692331)	-0.198649*** (-3.615946)
FBHE		-0.148798*** (-3.448252)	
ETS			0.054286 (0.995161)
LAB	0.120850** (2.574583)	0.216647*** (4.104683)	0.214744*** (3.723569)
GE	-0.345933*** (-5.547801)	-0.294320*** (-3.598744)	-0.287666*** (-2.675892)
EU		-0.037035 (-0.922924)	-0.077430* (-1.754902)
GNPPC		-0.169608** (-2.046747)	-0.174924* (-1.827583)
AS	-0.564475*** (-4.453650)	-0.508386*** (-3.762994)	-0.339323* (-0.339323)
TR	-0.230060** (-2.096230)	-0.357785*** (-3.121028)	-0.337525*** (-1.962862)
LA	-0.071689 (-0.515566)	-0.192400 (-1.312359)	0.020158 (0.126696)
IC	-0.551179*** (-3.946000)	-0.342006** (-2.048517)	-0.308478 (-1.378744)
Included observations	109	97	79
Adjusted R-squared	0.631988	0.685871	0.698989

t statistics in parenthesis

\*\*\*=significant at the 1% level; \*\*= significant at the 5% level; \*= significant at the 10% level.

The tax rate variable (FBHE) is highly significant in all regressions, but does not show the expected sign as it appears that higher taxes lead to a smaller hidden economy. This of course is counter-intuitive. A negative sign for a tax rates variable was also found in a paper by Johnson et al. (1998), using a much smaller sample of informal economy estimates, based on averaged results from different researchers. They argue that the application of the rules is more important than the official tax rates and use an alternative measure for the tax system, which reflects economic agents' perception of how the tax system works.<sup>7</sup> They argue that with a “good” tax system marginal tax rates are not of much importance for the size of the informal economy. It is hard to follow this reasoning; it should be expected that among two

<sup>7</sup> Johnson et al. (1998) use a World Economic Forum Index for 1997 executives' responses to the question: “The tax system in your country hinders (enhances) business competitiveness.” Newer WEF opinion polls ask for the “efficiency of the tax system”, the ETS variable in this study. Regressions using the original data used by Johnson et al. replicate their results, but their sample is quite small.

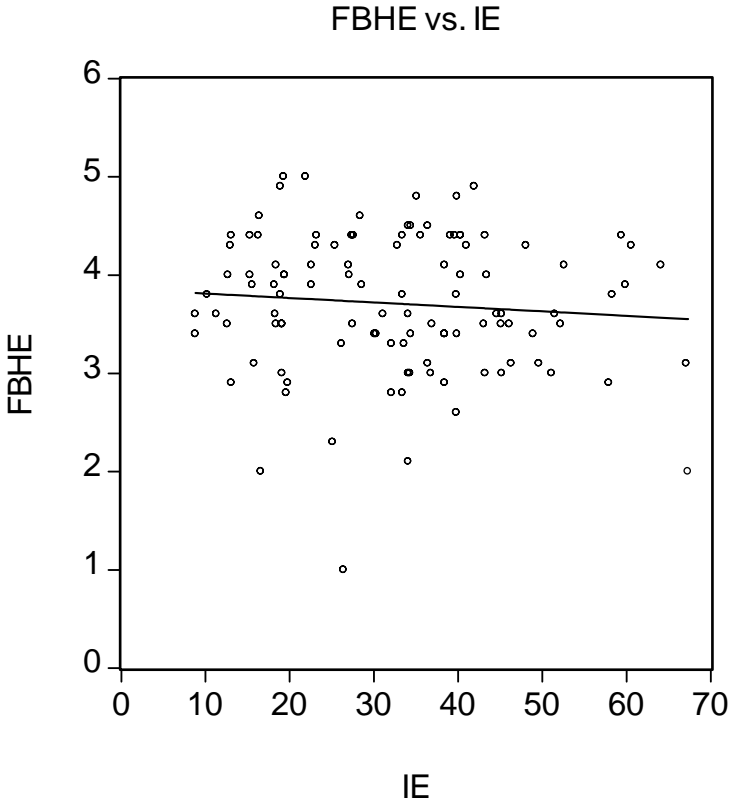
countries with similarly “good” tax systems the one with lower marginal tax rates would have a smaller informal sector than the one with higher marginal tax rates, and not the other way round. If a variable (ETS, expected sign negative) as a measure of the efficiency of the tax system is included in the regressions here, it again shows the wrong sign and is not significant. Controlling for GNP per capita reveals that the tax rate index does not only reflect the differences in per capita income, even if higher tax rates are often found in industrialised countries. Also, the tax rate indicator is still significant with the wrong sign if regional differences are taken into account. The data points to the conclusion that in a cross-country comparison different tax rates are compatible with identical sizes of the informal economy. This is not to say that the informal economy in a given country may not grow in size if taxes increase; this is just not an important indicator in cross-country comparisons. Maybe the omission of variables such as "tax morality" for example is responsible for this result.<sup>8</sup>

It may also be that the causal relationship does not run from marginal tax rates to the size of the informal sector, but the other way around. Let's suppose that informal economies do not mainly reflect regulatory policies, but exist for other reasons, which are for now assumed to be exogenous. A large informal economy may thus describe a situation where comparative costs for not complying with overall regulation are small, and governments cannot increase rates in the formal sector without increasing the informal sector substantially. This may explain a negative relationship between both variables and imply that unknown factors are not included in the analysis.

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<sup>8</sup> Loayza's much-cited results do not contradict the findings here. Loayza found a positive relationship between tax rates and the size of the informal economy in Latin America. Regional regressions with the data used here again produce a positive relationship for Latin America (and the industrialised countries) but a negative one for the other regions. It seems that one should be very cautious in the extrapolation of results from regional data.

Chart 5: Taxes and the size of the informal economy



**7. Direct estimates of the informal sector: The case of Latin America**

In Table 4 the aforementioned direct estimates for the informal economy in Latin America are used. Most of the variables that are expected to influence on the size of the informal economy are significant, including cost and duration of starting a business. As before variables are expressed in multiples of standard deviation. The cost of starting a business shows the highest absolute coefficient, therefore in the Latin American context this is a variable that policy makers seeking to reduce the informal economy should be especially aware of. Because of the small sample size results nevertheless must be interpreted with caution.

Table 4: Regressions on direct estimates for Latin America

Independent variables	Dependent variable: SILALOGODDS White Heteroskedasticity-Consistent Standard Errors & Covariance	Dependent variable: SILAOGODDS White Heteroskedasticity-Consistent Standard Errors & Covariance
constant	0.478785* (1.933478)	0.750288** (2.450673)
GELA	-0.175963*** (-4.489503)	-0.150682*** (-3.215573)
EULA	-0.146149*** (-3.376545)	-0.174716*** (-3.771445)
SBCLA	0.173006*** (4.158404)	0.185990*** (4.580987)
SBDL		0.098598** (2.021140)
LABLA		-0.059551 (-1.294029)
Included observations	16	16
Adjusted R-squared	0.830603	0.874934

t statistics in parenthesis

\*\*\*=significant at the 1% level; \*\*= significant at the 5% level; \*= significant at the 10% level.

## 8. Pronounced regional differences

The regression estimates in Table 2 indicated the importance of the regions in explaining the size of the informal economy. It may be assumed that the relationship between independent variables and the size of the informal economy varies from region to region. Therefore a set of regional regressions is calculated. The results are shown in Table 5.

Table 5: Regional regressions

	Africa	Asia	Industrialised Countries	Latin America	Transition Countries
	IEAFLOGODDS	IEASLOGODDS	IEICLOGODDS	IELALOGODDS	IETRLOGODDS
C	-1.014012** (-2.367146)	-1.612157* (-1.807305)	-1.268429* (-2.077105)	0.847707 (0.530299)	-1.131884** (-1.953713)
GE	-0.147805 (-1.619518)	-0.232601 (-1.341421)	-0.460651*** (-3.369599)	-0.253212 (-1.176163)	-0.579304*** (-4.526729)
LAB	0.143511 (1.627716)	0.114792 (0.741051)	0.198302** (2.229910)	-0.000262 (-0.001315)	0.107513 (1.611372)
EU	-0.027257 (-0.365029)	0.018029 (0.166958)	-0.024393 (-0.273102)	-0.268448 (-1.472418)	-0.046121 (-0.748290)
Included observations	19	22	18	17	21
Adjusted R-squared	0.620557	0.072771	0.577198	0.194845	0.550413

White Heteroskedasticity-Consistent Standard Errors & Covariance

t statistics in parenthesis

\*\*\*=significant at the 1% level; \*\*= significant at the 5% level; \*= significant at the 10% level.



The results indicate that the effectiveness of government shows the right sign in all the regions, but is significant only in the industrialised and the transition countries. Labour regulation is significant only in the industrialised countries, whereas ethnic uniformity seems to be of no importance in any region. The small number of observations in each region of course is a limit for this analysis

Other indicators representing aspects of “good governance” are included in the analysis of the determinants of the size of informal economies in the regional analysis in order to detect regional differences in the importance of aspects of governance (Voice and Accountability Indicator, Political Stability Indicator, Government Effectiveness Indicator, Regulatory Quality Indicator, Rule of Law Indicator, Control of Corruption Indicator).<sup>9</sup> Three of these indicators can be expected to be directly linked to the importance of the hidden economy. As already mentioned above, a good rule of law (ROL), including strong property rights, increases the advantages of producing in the formal sector of the economy. Furthermore, an effective government (GE), including effective application of the tax and regulatory procedures, should help to keep down the size of the informal economy. Good regulatory quality (RQ) should limit the incentives for leaving the formal economy.

If GE in the regional regressions of Table 3 is substituted for other government indicators, GE shows the highest (absolute) t-statistics in most of the regressions with the exception of the transition countries, where control of corruption seems to be more important. In these countries corruption is widespread and facilitates working in the informal sector substantially. Regional regressions with the perception index as dependent variable could not be calculated because sample sizes are very small.

## **9. Conclusions**

The comparison of a large set of estimates for informal economies using indirect estimation techniques and an large set of data regarding the perceptions of the size of informal economies reveals that the distribution of the size of the informal economy in both sets is similar, but the mean estimates of the indirect estimation method are substantially larger. The difference may be explained by the fact that the indirect estimation methods are unable to distinguish between different types of activities within the shadow economy and include

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<sup>9</sup> For data description see Appendix "The data".

activities resulting from criminal behaviour as well as per se legal activities carried out in such a way as to evade taxes or regulatory requirements.

The rational behaviour approach for analysing the determinants of the informal economy explains its size by the relative costs and benefits of conducting economic activities in the formal (or informal) sector. Some of the findings of time series analysis of the determinants of the size of the informal economy could not be reproduced in this cross-country analysis with a large international sample. Different levels of tax rates in particular seem to be compatible with similar sizes of the informal economy, whereas the degree of labour market regulation explains a significant part of the differences between the informal economies around the world. The costs of starting a business do not seem to be especially important in explaining the informal economies; it is not significant in any of the regional or world regressions. As far as the benefits of conducting business in a formal sector are concerned, indicators of good governance, especially an effective government are important. The regional analysis reveals pronounced differences; in Latin America, Asia, and Africa this indicator is not significant.

The relative importance of indicators reflecting the rational behaviour approach and socio-cultural indicators differs from region to region. In Latin America in particular, the relative size of the indigenous population is important in explaining the size of the informal economy. However, the regional analysis also reveals that those aspects of good governance which are important in containing the size of the informal economy differ from region to region. In transition countries control of corruption is more important than government effectiveness.

The size of the informal economy varies from region to region. In the world regression, regional dummies reveal strong regional differences, which cannot be explained by ethnic or regional diversity. This points to the fact that behavioural differences and/or traditions (for example colonial past) are important and that the pure rational behaviour approach is not sufficient for explaining the size of the informal economy. The government indicators do not capture these differences fully.

Governments that seek to limit or decrease the size of the informal economy must therefore start from a country-specific analysis of the reasons why economic agents choose to conduct their business in the informal sector. It seems that lowering the costs of starting a formal business and streamlining labour regulation in general terms is advisable, especially if the factors that make the application of these rules more difficult for less well educated people

and ethnic minorities are taken into account. Tax rates are probably important in a country-specific analysis, but in many cases actions aimed at improving the functionality of the legal system and the containment of corruption are very important as well.

## **Appendix: The data**

### **Informal Economy Indicators**

**IE:** Informal economy in % of GDP, physical input (electricity), the currency demand or the model (DYMIMIC) approach, average for years 1999 and 2000. Source: Friedrich Schneider, Size and Measurement of the Informal Economy in 110 Countries around the World, World Bank, July 2002, n=109

**IEPER:** Answer to the question “What percentage of business in your country would you guess is unofficial or unregistered”, World Economic Forum 2003

**SI:** Urban population employed in low productivity sectors in Latin America (around 2000), Source: ECLAC, Panorama Social 2001-2002, n=17

### **Standard of Living Indicator**

**GNPpc:** Gross National Product per capita (year 2000), Atlas Method, World Bank, World Development Indicators

### **Regional Dummies**

**AF:** African country dummy

**LA:** Latin American country dummy

**AS:** Asian country dummy

**TR:** Transition country dummy

**IC:** Industrialised country dummy

### **Tax Indicators**

**ETSWEF:** Efficiency of the tax system (Perception of Business Leaders), World Economic Forum

**FBHE:** Fiscal burden indicator, combines top marginal income tax rate, top marginal corporate tax rate, and year-to-year change in government expenditures as a percent of GDP (Year 2000), Source: Heritage Foundation, Index of Economic Freedom

**SS:** Social security contributions as % of GDP, World Bank, World Development Indicators (Year 2000)

**Tax:** Taxes as % of GDP, World Bank, World Development Indicators (Year 2000)

**Taxss:** Taxes and social security contributions as % of GDP, World Bank, World Development Indicators (Year 2000)

### **Cost of Starting a Business Indicators**

**SBD:** Duration of proceedings for starting a business, World Bank, Doing Business Indicators (Year 2003)

**SBC:** Costs of proceedings for starting a business as % of GNPpc, World Bank, Doing Business Indicators (Year 2003)

### **Socio – Cultural Indicators**

**EU:** Percentage share of a dominant ethnic group in a country's total population

**ERU:** Product of percentage of dominant ethnic group and share of dominant religion in a country.

Both indicators are scaled in a way that 100 represents total uniformity and the lower the value the higher the diversity, Source: CIA World Fact Book

### **Governance Indicators**

**COC:** Control of Corruption Indicator (Year 2000)

**GE:** Government Effectiveness Indicator (Year 2000)

**PS:** Political Stability Indicator (Year 2000)

**ROL:** Rule of Law Indicator (Year 2000)

**RQ:** Regulatory Quality Indicator (Year 2000)

**VA:** Voice and Accountability Indicator (Year 2000)

Source: Daniel Kaufmann, Aart Kraay, Massimo Mastruzzi, Governance Matters III: Governance Indicators for 1996-2002, World Bank, April 5, 2004

### **Labour Regulation Indicators**

**LAB:** Composition of the following four indicators:

**CEI:** Conditions of Employment Index

**ELI:** Employment Laws Index

**FFI:** Flexibility of Firing Index

**FHI:** Flexibility of Hiring Index

A lower value indicates higher flexibility, Year 2003

Source: Juan Botero, Simeon Djankov, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer, The Regulation of Labour, World Bank, May 2004

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