STRUCTURAL REFORM AND ENTREPRENEURSHIP [*]

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We study the impact of structural reform on entrepreneurship. Building on institutional economics, we argue that the two main components of structural reform – economic liberalization and national governance improvements – impact formal, informal, and total entrepreneurship differently. We propose that economic liberalization positively impacts all three types because it expands entrepreneurial opportunities for all firms. However, we argue that national governance improvements have a positive impact on formal entrepreneurship – but a negative impact on informal entrepreneurship – because the better quality and implementation of regulations that accompany national governance improvements benefit the formal sector while limiting the informal one. Furthermore, counter to extant theory, we argue that national governance improvements reduce total entrepreneurship because better regulations incentivize not only the creation of more formal enterprises but also better labor regulations, inducing many informal entrepreneurs to join the labor force instead of formalizing their informal enterprises.

Having a better understanding of how institutions affect different types of entrepreneurship is important. The literature on economic growth in general and that on entrepreneurship in particular has mostly paid attention to formal entrepreneurship, despite the importance of informal entrepreneurship in many developing countries. A common conception of entrepreneurship in the literature is that of new firm creation in a formal (i.e., registered or legal) sense (e.g., Klapper *et al.*, 2007). However, the entrepreneurial spirit is oftentimes unencumbered by the constraints of legal requirements and may thus lead to informal (i.e., unregistered or not legally sanctioned) entrepreneurship (e.g., Williams and Round, 2007). This is a distinction that has been largely overlooked in the entrepreneurship literature, which has led to theoretical and empirical confounding (Nyström, 2008). Thus, when policy-makers are considering institutional changes, extant theory does not provide clear suggestions on what the likely impact of such changes would be. Stronger institutions are typically considered an important means of developing the economy and increasing entrepreneurship because such institutions are crucial for enabling market growth (e.g., Casson and Wadeson, 2007; Klapper *et al.,* 2007). However, it is not clear how institutions affect different types of entrepreneurship.

Therefore, we focus on how an important form of institutional change, structural reform, affects three types of entrepreneurship: formal, informal, and total. Structural reform is a type of institutional change whereby the institutional framework and regulations are realigned to support the proper functioning of the market economy (Williamson, 1990, 2000, 2004). It has been spreading rapidly throughout the world in recent decades (Rodrik, 2006).

We argue that the two main components of structural reform - economic liberalization and national governance improvements (Fukuyama, 2004; Williamson, 1990, 2004) - have a differential impact on formal, informal, and total entrepreneurship. Economic liberalization

refers to the extent or scope of economic activity controlled by the state or the market. National governance improvements refer to the strength or capability of the state to enforce its legal framework in order to allow for the proper functioning of the market economy. We posit that economic liberalization tends to have a positive impact on these three forms of entrepreneurship because it leads to increased opportunities for all firms. However, we propose that improvements in national governance tend to have a positive impact on formal entrepreneurship – but a negative impact on informal entrepreneurship – because improvements in regulations and in their implementation tend to benefit the formal sector while limiting the informal one. Furthermore, contrary to extant theory, we argue that national governance improvements reduce total entrepreneurship because better regulations incentivize not only the creation of more formal enterprises but also better labor regulations, inducing many potential informal entrepreneurs to join the labor force instead of formalizing their informal enterprises.

These arguments contribute to the institutional economics theoretical literature (e.g., North, 1981, 1990) by delving deeper into the analysis of the impact of institutions on entrepreneurship and explaining that stronger institutions are not necessarily better for all types of entrepreneurship. An assumption of institutional economics is that market institutions are beneficial for economic development in general. We contribute to this literature by providing a theoretical boundary on the benefits of market institutions, explaining how not all forms of entrepreneurship benefit from structural reform.

Furthermore, the arguments contribute to the entrepreneurship literature (for recent reviews, see Acs and Audretsch, 2003a; Alvarez, Agarwal, and Sorensen, 2005; Casson *et al.*, 2006; Cuervo, Ribeiro, and Roig, 2007a; and Sexton and Landstrom, 2000) by focusing on the distinction between formal, informal, and total entrepreneurship and by theorizing on how

institutional change impacts them differently. Most entrepreneurship studies have focused on developed countries. However, developing countries have the greatest need for entrepreneurship to aid in their development, but there is limited understanding of how institutions affect entrepreneurship in those countries (Ahlstrom and Bruton, 2006; Bruton, Ahlstrom, and Obloj, 2008; Busenitz, Gómez, and Spencer, 2000; Young *et al.*, 2008). We explain how theoretical predictions derived from the study of entrepreneurship in developed countries, which entails primarily formal entrepreneurship, need to be reexamined when dealing with entrepreneurship in emerging economies, which includes an important content of informal entrepreneurship.

THEORY AND HYPOTHESES

Structural Reform

To analyze the impact of structural reform on entrepreneurship, we build on institutional economics (Djankov *et al.*, 2002; Glaeser *et al.*, 2004; North, 1981, 1990; North and Thomas, 1973)[1]. We do so because structural reform is a form of institutional change, and institutional economics is well equipped to explain the impact of institutions on the behavior of economic actors, such as entrepreneurs. North (1990: 3) defines institutions as "the rules of the game in a society… the humanly devised constraints that shape human interaction." The theory is built on assumptions of imperfect markets, opportunism, bounded rationality, and profit maximization.

Institutions have emerged as a significant determinant of national development (North, 1990), explaining the growth of countries (e.g., Acemoglu, Johnson, and Robinson, 2001), development of finance (e.g., La Porta *et al.*, 1998), innovation (e.g., Furman, Porter, and Stern, 2002), foreign direct investment (e.g., Bevan, Estrin, and Meyer, 2004), the behavior of

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[1] Besides institutional economics, Campbell (2004) identifies two other schools that analyze the influence of institutions on firms: organizational institutionalism or neo-institutionalism (e.g., Scott, 1995) and historical institutionalism (e.g., Granovetter, 1985). We do not build on these two other schools, because their assumptions are largely incompatible with those of institutional economics (Campbell, 2004).

multinational enterprises (e.g., Henisz, 2000), strategic choices (e.g., Peng, 2003), and formal entrepreneurship (e.g., Klapper *et al.,* 2007).

Structural reform consists of a transformation of the institutional frameworks and regulations that allow markets to function properly (IMF, 2004: 105). As such, structural reform has two main dimensions: economic liberalization (in the form of deregulation of markets, liberalization of prices, and privatization of state-owned firms) and improvements in national governance (in the form of flexible and targeted regulation that limits market imperfections) (Fukuyama, 2004; Williamson, 2004). Economic liberalization refers to the extent or scope of economic activity controlled by the state. National governance improvements refer to the strength or capability of the state to enforce its legal framework in order to allow for the proper functioning of the market economy. The role of the government in the economy is transformed into providing the basic infrastructure, rules, law and order, and public goods required for individuals and firms to undertake their economic relationships, while limiting market imperfections (Frye and Shleifer, 1997). The idea behind structural reform dates back to Adam Smith (1776) and was further developed by writers of the Austrian School (e.g., Hayek, 1944) and the Chicago School (e.g., Friedman, 1962). The last three decades have witnessed the spread of structural reform throughout the world (Rodrik, 2006; Yergin and Stanislaw, 1998).

Formal and Informal Entrepreneurship

Beginning with the seminal works of Schumpeter (1934, 1942) and Kirzner (1973), there has been general consensus in the field that entrepreneurship is a key determinant of economic development and growth (e.g., Agarwal, Audretsch, and Sarkar, 2007; Baumol, 2004; Baumol and Strom, 2007; Zacharakis, Bygrave, and Shepherd, 2000). However, there is as of yet no universal consensus on the definition of the term entrepreneurship (Acs and Audrestch, 2003b;

Cuervo, Ribeiro, and Roig, 2007b). It can be viewed as the creation of ideas, of firms, of patents, or even the process of thinking about these creations, even if it does not lead to their actual implementation.

In this paper, we take a narrower view of entrepreneurship to keep the discussion at a manageable level. We thus focus on its functional form and view entrepreneurship as the creation of new firms. We further distinguish between formal, informal, and total entrepreneurship. Formal entrepreneurship refers to the creation of new firms that are legally registered in a given country (Klapper *et al.*, 2007). Informal entrepreneurship is the creation of new firms that are not legally registered and are largely unregulated (Nyström, 2008). Total entrepreneurship is simply the sum of formal and informal entrepreneurship.

The distinction between formal, informal, and total entrepreneurship is an important one that has received little attention in the entrepreneurship literature, in part due to the difficulty of measuring these constructs. Formal entrepreneurship has received the majority of the attention in the literature because most studies have focused on developed countries where entrepreneurs operate primarily in the formal sector (Ahlstrom and Bruton, 2006; Bruton *et al.*, 2008). However, informal entrepreneurship is widespread, particularly in developing countries where it represents the majority of the informal sector (ILO, 2002b). The term "informal sector" was introduced concurrently in the literature by the economist Keith Hart (1973), in his study of the economy of Ghana, and by the United Nations' International Labour Organization (ILO, 1972), in its study of the economy of Kenya. In 1993, the International Conference of Labor Statisticians defined the informal sector as comprising all unregistered firms smaller than a certain size (ILO, 1993). Gradually, the term "informal sector" came to be replaced by the term "informal economy," which incorporates not only informal firms of all sizes (i.e., informal self-

employment) but also informal paid labor (i.e., informal wage employment) (ILO, 2002b). Several terms have been used in the literature to refer to the informal economy, such as unofficial, shadow, subterranean, unregistered, irregular, and underground economy. The ILO suggests that the informal economy represents as much as 50% to 75% of the total economy in many parts of the world and that informal entrepreneurship represents the majority of that share (ILO, 2002b: 12; for a review of the literature on the informal economy, see Losby *et al.*, 2002).

The Impact of Structural Reform on Entrepreneurship

There is little understanding of whether and how institutions encourage or discourage different types of entrepreneurship. The literature has focused on formal and total entrepreneurship without distinguishing between the two (Bjørnskov and Foss, 2008; Freytag and Thurik, 2007; Klapper *et al.,* 2007; Nyström, 2008; Sobel, Clark, and Lee, 2007). However, the International Labor Organization (ILO) estimates that informal economic activity represents between 50% and 75% of the total economy in many parts of the world, especially in developing countries (ILO, 2002a, 2002b).

Before we explain how structural reform affects entrepreneurship, we need to establish some theoretical boundaries. First, we separate entrepreneurial activities into two types, formal and informal, based on a company's registration status (Nyström, 2008). However, formal firms may undertake informal activities (e.g., tax evasion) and informal firms may undertake formal activities (e.g., supply contract implementation). We do not focus on these aspects of formality or informality within firms. Second, we focus on the creation of firms as the indicator of entrepreneurship. There are other dimensions of entrepreneurship on which we do not focus, such as innovation or change (Acs and Audrestch, 2003b; Cuervo *et al.,* 2007b). Third, we discuss the two broad dimensions of structural reform, economic liberalization and national

governance improvements (Fukuyama, 2004). We do not discuss their subcomponents because they are two subsystems of interrelated reforms that reinforce each other's influence. Our goal is to understand how these two dimensions, as composites, impact entrepreneurship.

In order to illustrate how structural reform has affected entrepreneurship, we provide examples from Mexican entrepreneurs. We conducted several interviews of formal and informal entrepreneurs from Mexico to better understand the concepts and relationships. Given the delicate nature of the topic, we change some of the names of the interviewees in order to protect their anonymity. Mexico serves as a good exemplar because the country has instituted a great degree of structural reform throughout the last two decades, and because it generates a substantial amount of both formal and informal entrepreneurship. These examples do not offer scientific evidence, but illustrate in more concrete terms how the two dimensions of structural reform – economic liberalization and governance improvements – affect entrepreneurs.

The impact of economic liberalization on entrepreneurship. We argue that economic liberalization has a positive impact on formal and informal (and thus on total) entrepreneurship because it increases the opportunities for both types of firm creation. Economic liberalization entails the deregulation of industries and markets, the liberalization of prices, and the privatization of state-owned firms as part of the reduction of state intervention in the economy (Peltzman, 1989; Vickers and Yarrow, 1988; Winston, 1993; Williamson, 2004). These three aspects are part of a system in which each reinforces the others. The retreat of the state from its active participation in the economy expands the set of decisions and actions available to private firms by lifting barriers to entry into areas and activities that were formerly undertaken by the state. Thus, entrepreneurs can participate in new economic activities and undertake new business ventures, creating not only formal but also informal firms.

First, economic liberalization has a positive effect on formal entrepreneurship because it reduces the barriers to entry and increases the opportunities available to entrepreneurs. Government bureaucracies and other inefficiencies lead to increased transaction costs for entrepreneurial ventures (Luo and Junkunc, 2008). As the government reduces its active participation and control of market activities – by reducing unnecessary or bureaucratic regulations, reducing or eliminating price controls, and privatizing firms – potential entrepreneurs have a bigger activity and decision set.

The deregulation of industries and markets facilitates the creation and management of profitable enterprises by reducing the constraints that hinder such ventures. Deregulation decreases the influence of the state in market activities and the barriers to entry, leading to more opportunities for potential private investors to forge entrepreneurial ventures. It also leads to a more open banking and financial environment (Levine, 2001), where it is easier for potential entrepreneurs to obtain the necessary funds to start a business. Deregulation allows domestic enterprises to have greater access to foreign markets by facilitating trade (Edwards, 1993), thus leading to a greater potential market for their goods or services and providing opportunities for entrepreneurs to sell abroad.

Moreover, eliminating price controls allows the forces of supply and demand to determine the optimal level for prices, allowing enterprises to operate more profitably, encouraging entrepreneurship. The reduction or elimination of price controls makes it easier for businesses to remain competitive while setting prices based on what customers are willing to pay. In addition, the reduction of price controls enables a more stable inflation rate and thus helps reduce some of the risks in the day-to-day operations of entrepreneurial ventures.

Furthermore, privatization opens up the market to private entrepreneurial ventures as state-owned firms are sold in the market (Spicer, McDermott, and Kogut, 2000). Entrepreneurs can own assets from which they were previously excluded, making new and in many cases better use of these assets than state-owned firms (Vickers and Yarrow, 1988), thereby increasing opportunities for new ventures.

An illustration of how economic liberalization helps the expansion of formal entrepreneurship is the case of Cinemex, a major Mexican movie theater corporation. Before 1992, the ticket price for movie admission was fixed at a low price by the government, making it difficult for movie theaters to turn a significant profit. As a result, movie companies and theaters were few and far between, with obsolete technology relative to the developed world. However, in 1992 the Mexican government passed a law liberalizing ticket prices for movie admission, which immediately made it more attractive to own and operate cinemas. Three Harvard students – Miguel Dávila, Matthew Heyman, and Adolfo Fastlicht – took advantage of this opportunity by raising enough venture capital to start Cinemex, which is now one of the largest cinema companies in the country, and which provides the latest technology in its movie theaters.

Second, economic liberalization also increases informal entrepreneurship because most of the incentives it affords to formal entrepreneurs are equally available to their informal counterparts. Since most of the arguments we provide above apply also to informal firms, we now discuss the characteristics that create incentives for informal enterprises only.

The deregulation of the economy facilitates the growth of informal firms because the government retreats from the economy, creating opportunities for individuals who may not have been able to operate in the market previously, yet lack the resources to enter the formal economy. As was the case in Russia, the period of deregulation may result in rules of behavior in flux that

increase uncertainty (Puffer and McCarthy, 2001), inducing entrepreneurs to enter the market informally (i.e., without registering the firm) because it is unclear what the applicable rules are.

Moreover, the liberalization of prices enables informal operators to enter the economy. Price controls limit the goods that are offered in the market because prices established by the government are usually under the true cost of the goods, inducing individuals and firms to forego business opportunities. The liberalization of prices enables producers to offer goods and services in the market at prices that cover the cost of production, but at the same time may give rise to the emergence of a gray market of parallel imports as entrepreneurs arbitrage price differences across countries (Lim, Lee, and Tan, 2001; Maskus and Chen, 2004).

In addition, privatization and government retrenchment from direct economic activities create new opportunities for informal entrepreneurial ventures to arise. Informal operators are not likely to participate in the acquisition of privatized assets. They nevertheless benefit from the retrenchment of the state and the reduction of exclusions over activities that were previously reserved for the state, as they can now enter and sell in place of previous state-owned firms.

An example of how economic liberalization can increase informal entrepreneurship comes from our interview with formal entrepreneur Darío Jiménez. He explains that street vendors in front of his store have been greatly increasing, as they can now more easily obtain pirated products, such as CDs, DVDs, and videogames. Given the increasing demand for these products, with consumers trying to obtain them at bargain prices, informal commerce has thrived with economic liberalization.

In sum, we argue that economic liberalization leads to an increase in formal and informal (and thus in total) entrepreneurship because it increases the business opportunities available for all firms. Formally, we hypothesize that:

Hypothesis 1a. Economic liberalization has a positive impact on formal entrepreneurship.

Hypothesis 1b. Economic liberalization has a positive impact on informal entrepreneurship.

Hypothesis 1c. Economic liberalization has a positive impact on total entrepreneurship.

The impact of national governance improvements on entrepreneurship. We also argue that national governance improvements impact the three types of entrepreneurship differently. Specifically, we argue that national governance improvements increase formal entrepreneurship but decrease not only informal but also total entrepreneurship, albeit for different reasons.

National governance improvements, designed to improve the functioning of the economy and market, have two main components: the reduction and improvement of regulations to facilitate economic transactions, and the improvement in the implementation and enforcement of such regulations. The state thus reduces or eliminates unnecessary or bureaucratic procedures that hinder formal new firm creation and creates new or alters the extant regulations to better align them with a more efficient functioning of the economy (Djankov *et al.,* 2002). In addition to better regulations, the state improves their implementation and enforcement, because regulations on their own are of little service if not properly implemented.

First, we propose that national governance improvements lead to an increase in formal entrepreneurship because having better regulations, and better implementation, reduces the transaction costs inherent in creating and managing new formal enterprises. The improvement in the regulatory framework, designed to facilitate market transactions, supports the reduction in transaction costs and induces growth (Hall and Jones, 1999; Laffont, 2005). The cost of setting up a formal enterprise is reduced; entrepreneurs who previously had a viable idea but found the costs of contracting to be excessively high relative to their expected return or risk preference are now encouraged to create the firm. As national governance is improved, uncertainty and

monitoring costs of establishing contractual relationships are reduced as specialized monitoring systems emerge. Much of the burden of having to establish economic relationships can be transferred from the entrepreneur to the institutional framework. As a result, entrepreneurs dealing with their suppliers or clients do not have to invest in personal controls but can rely on impersonal, market controls in their economic relationships (Peng, 2003). Additionally, the improvement in the application of regulations further reduces costs by limiting uncertainty in the application of contracts and reducing monitoring costs by improving the defense of contract disputes in courts.

An illustration of how national governance improvements induce the expansion of formal entrepreneurship is the case of David Álvarez, a Mexican real estate entrepreneur. He believes that the implementation of stronger regulations has allowed him to grow his real estate business and establish new operations by curbing the malfeasance of local politicians and making contracts more easily enforceable. He explains that the government has made it easier to acquire permits to build, sell, and rent commercial real estate. He describes how, in order to obtain a permit before, he had to jump through multiple bureaucratic hoops. Businessmen with friends in high places had an advantage in being able to obtain the necessary permits in a timely fashion, making it difficult for him to expand his business. Although governance problems have not been fully resolved, those improvements that have been implemented have made it easier to expand.

In sum, national governance improvements have a positive impact on formal entrepreneurship because improvements in regulations and their implementation reduce the transaction costs of registering and maintaining new formal enterprises. We hypothesize that:

Hypothesis 2a. National governance improvements have a positive impact on formal entrepreneurship.

Second, we argue that national governance improvements induce a reduction of informal entrepreneurship because having better regulations and implementation of these regulations reduces the incentives and increases the costs inherent in creating new informal enterprises. The improvement in national governance and the associated reduction in transaction costs of creating formal firms reduce the incentive for creating informal enterprises. Entrepreneurs that previously had to resort to operating in the informal sector because of the high cost of creating a formal enterprise (de Soto, 2000) no longer have such incentives. Additionally, better national governance discourages the creation of informal enterprises because the potential punishment for doing so increases. By having better regulatory and legal institutional constraints on economic misbehavior and by penalizing corrupt behavior, economic actors are motivated to act within the frameworks of the law. Potential entrepreneurs considering the option of starting a company increasingly may prefer to do so legally to avoid legal repercussions for any illegal actions. In addition, due to the reduction in corruption and better enforcement of regulations, informal entrepreneurs are less able to bypass or avoid these regulations.

An example of how improvements in national governance reduce informal entrepreneurship is the transformation of informal markets in downtown Guadalajara, Mexico, into formal ones. Nearly 30 years ago, the government of Guadalajara converted several city blocks in the city center into a pedestrian mall. Informal entrepreneurs placed informal shops in the middle of the pedestrian streets, benefitting from lax government regulations and not paying taxes. When formal shops lobbied the government to remove the informal ones, the informal shops formed organizations to respond to these pressures and lobbied and bribed officials to defend their existence for over two decades. On November 2006, the state government decided to resolve the issue by relocating the informal shops into an underground shopping corridor near

the cathedral. This relocation provided informal entrepreneurs with a formal storefront that eliminated the fines and hassles of operating informally, with the ability to close at night and keep their merchandise secure rather than carry it back to storage each night, and with subsidized rent for several years. However, formalizing their businesses also meant regulations, payment of taxes, and no longer being able to peddle illegal products, such as pirated CDs, DVDs, and videogames. Although many of the informal entrepreneurs resisted the government mandate and held their posts firmly, the government sent the police and "escorted" the informal shops from the area. The shops of the entrepreneurs that relocated have survived, but they complain that it is increasingly difficult to remain competitive because of the higher costs of operating legally.

In sum, national governance improvements, by increasing the strength and quality of the government regulations overseeing market activities, greatly improve the potential for formal entrepreneurship and serve as a disincentive for informal entrepreneurship. We thus hypothesize:

Hypothesis 2b. National governance improvements have a negative impact on informal entrepreneurship.

Third, we propose that national governance improvements lead to a reduction in total entrepreneurship, as better regulations incentivize not only the creation of more formal enterprises but also better labor regulations, inducing many potential formal entrepreneurs to instead join the labor force (ILO, 2002). That is, strong disincentives against informal entrepreneurship do not always translate directly into formal entrepreneurship. In a weak governance framework, many individuals choose to start informal entrepreneurial ventures not as an alternative to starting formal ones, but as an alternative to working as employees in an economic environment without labor regulations in place that make it attractive to do so. Governance improvements decrease the incentives for entrepreneurs to generate and maintain

informal firms. However, increased governance not only improves the quality of regulations that make it easier for formal firms to succeed, it also makes it easier for employees to lead a rewarding and comfortable life without having the risks of an enterprise on their shoulders. As such, given the choice, a number of informal entrepreneurs decide to become employees working for a formal company, rather than formalizing their informal ventures, resulting in a reduction in total entrepreneurship.

An example of how improvements in national governance may induce former informal entrepreneurs to become employees instead of formal entrepreneurs comes from our interview with Tomás Gómez, a Mexican informal entrepreneur who closed his store and now works for another company. Mr. Gómez created an informal business selling tamales, a type of fast food in Mexico. His store was located on one of the main highways of Mexico to capitalize on the large number of passing motorists. Although the business appeared to be formally established and he rented a storefront, it was actually not legally registered in order to get around the complicated procedures that were required to register a business in Mexico and to avoid taxation. However, he explains that as strict regulations began to be implemented and enforced, his business and those around it were fined and threatened with closure unless they were formalized. Although some neighboring entrepreneurs got around these issues by bribing officials, this increased their operating costs. As a result of the increased costs of operating under stricter and better implemented regulations, Mr. Gómez considered formalizing the operation. However, he concluded that high taxes and the inherent uncertainty of the operation would render it unprofitable. Instead, he decided to close the informal enterprise and seek employment in a company that would provide benefits (e.g., retirement, healthcare) for him and his family. He

explains that he has never regretted the decision, as it has allowed him to have the peace of mind of knowing his family will have a roof over their heads each morning.

In sum, we argue that national governance improvements reduce total entrepreneurship because better regulations incentivize not only the creation of more formal enterprises but also better labor regulations, which induce many potential entrepreneurs to join the labor force instead. Thus, we hypothesize that:

Hypothesis 2c: National governance improvements have a negative impact on total entrepreneurship.

RESEARCH DESIGN

Data Sources

Given the difficulty inherent in properly assessing the magnitude of informal entrepreneurship across the globe (ILO, 2002a; ILO, 2002b), we use several measures obtained from several sources to capture formal, informal, and total entrepreneurship in a given country. The sources of data we use are some of the most comprehensive databases on the topic in terms of countries and years covered. These are the World Bank Group Entrepreneurship Survey (WBGES) (Klapper *et al.,* 2007; World Bank, 2008a), the Global Entrepreneurship Monitor (GEM) (GEM, 2008; EIM, 2008), the International Benchmark of Entrepreneurship (IBE) (EIM, 2008; Verhoeven and Bruins, 2001), and the Comparative Entrepreneurship Data for International Analysis database (Compendia) (EIM, 2008; van Stel, 2003, 2005, 2006a, 2006b). For the sake of brevity, in our main analyses we only describe and present one measure for formal, one for informal, and one for total entrepreneurship, and we briefly describe and present the others in our robustness tests. Data on structural reform come from several sources: the Heritage Foundation/Wall Street Journal index of economic freedom (Holmes, Feulner, and

O'Grady, 2008), the Fraser Institute economic freedom of the world index (Gwartney *et al.*, 2007), and the World Bank's Worldwide Governance Indicators (WGI) project (Kaufmann, Kraay, and Mastruzzi, 2007). Data for the control variables come from the World Bank's World Development Indicators (World Bank, 2008b).

Variables and Measures

Table 1 summarizes the measures we use.

*** Insert Table 1 about here ***

Dependent variables. First, to measure formal entrepreneurship, we use the recently created WBGES (Klapper *et al.*, 2007). This measure covers 84 developing and industrialized countries and provides annual data for the period 2002-2005. As Klapper *et al.* (2007) explain, the measures are designed explicitly to capture formal entrepreneurship, i.e., "any economic unit of the formal sector incorporated as a legal entity and registered in a public registry…" (Klapper *et al.,* 2007: 4). They obtain the data primarily via a survey of business registries and additional government sources in each of the countries covered (p. 6). The resulting measures are the number of new and the number of established registered (or formal) firms in a given country and year. Following Klapper *et al.*'s (2007) lead, we use three measures from this data: entry per capita (new firms registered as a percentage of the population in thousands), entry density (new firms registered as a percentage of the labor force, in thousands), and entry rate (new firms registered in a given year as a percentage of established registered firms in the previous year). We use the first of these in our main analyses and the other two in the robustness tests.

Second, to measure total entrepreneurship, we use data from GEM (2008). GEM's Total Entrepreneurial Activity (TEA) is a well-established measure that covers 60 industrialized and

developing countries annually from 2000-2007[2], measuring the percentage of the working population of a given country that is currently in the process of creating a business or that owns one that is up to 3.5 years of age. This measure provides an estimate of total entrepreneurship as a percentage of the working population. It has been used extensively in the literature (e.g., Poh Kam, Yuen Ping, and Erkko, 2005; Wong, Ho, and Autio, 2005). Data are obtained from a survey where the respondents are asked whether or not they are in the process of starting a business or have started one in the last 3.5 years. This measure has been criticized for capturing not only formal, but also informal entrepreneurship, because it captures both registered and unregistered businesses (Nyström, 2008). We thus use it as a measure of total entrepreneurship.

Third, to measure informal entrepreneurship, we generate an informal economy index and two estimates of an informal entrepreneurship index (IEI). (We discuss the steps we follow to create these measures in appendix A). We use the first estimate of IEI in our main analyses and the other two measures in our robustness tests. To the best of our knowledge, there are no measures of informal entrepreneurship available in the literature. Therefore, although creating these measures is not the primary purpose of this paper, providing them serves as an important additional contribution to the entrepreneurship literature.

Independent variables of interest. Our primary measure of economic liberalization is the Heritage Foundation index of economic freedom (Holmes *et al.,* 2008). This measure covers 162 countries around the world for the period 1995-2008. It is an aggregate of nine equally weighted sub-indices (business freedom, trade freedom, fiscal freedom, government size, monetary

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[2] Although the data provided by Klapper *et al.* (2007) and GEM (2008) partially overlap in terms of the countries and years they cover, they differ somewhat. In order to cover the maximum amount of countries and years, we retain the full measures in the main analyses. In the robustness tests we present models using the years and countries that are common to both measures and find equivalent support for the hypotheses.

freedom, investment freedom, financial freedom, property rights, and freedom from corruption)[3].
Since property rights and freedom from corruption are measures of national governance and are
already included in our measure of national governance, we remove these two sub-indices and
use the mean of the seven remaining ones as our indicator of economic liberalization; using this
measure or the full measure results in similar results, as we describe in the robustness tests.

Our primary measure of national governance comes from the World Bank's World
Governance Indicators (Kaufmann *et al.,* 2007). This measure covers 212 countries and
territories from 1996-2006. It is available biannually for 1996-2002 and annually thereafter. The
data are composed of six indices: voice and accountability, political stability and absence of
violence, government effectiveness, regulatory quality, rule of law, and control of corruption. As
is commonly done in the literature (e.g., Klapper *et al.,* 2007), we use the mean of these six
indicators as our measure of national governance and extrapolate the data for the missing years
from the available observations by taking the mean of the previous and following year.

Control variables. We control for other possible predictors of entrepreneurship. First, we
control for gross domestic product (GDP) per capita because wealthier individuals have more
resources to create firms. Second, we control for GDP growth, because growing countries may
offer more opportunities for entrepreneurship. Third, we control for immigration as a percentage
of the total population, because immigrants may be more likely to become entrepreneurs (e.g.,
Portes, 1995). Fourth, we control for the year to parse out the effects of historical factors, such as
economic crises, that may affect entrepreneurship. Fifth, we control for other unobserved
country-specific factors by using panel models that account for the country.

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[3]   A tenth sub-index (labor freedom) was added to the index starting in 2005. In order to be able to establish
comparisons across time, we do not include this sub-index in the computation.

Method of Analysis

We analyze data using cross-sectional time-series random effects generalized least squares (GLS) models with correction for heteroskedasticity and panel-specific autocorrelation AR(1), which are models appropriate for panel data (e.g., Greene, 2000). We perform a Hausman test in order to determine whether a fixed or random effects model is more appropriate in this case. The results suggest that the random effects model is appropriate. In order to reduce potential multicollinearity issues and increase the interpretability of the results, we grand-mean center and standardize all of the continuous independent variables (Frazier, Tix, and Barron, 2004; Hofmann and Gavin, 1998). Furthermore, as is commonly done in the literature, we lag each of these variables by one year in order to ascertain their impact on the dependent variables the following year. The general model we use is as follows:

Entrepreneurship (formal, informal, or total) $_{kt}$ = β_0 + β_1 * *Economic Liberalization*$_{kt-1}$ + β_2 * *National Governance*$_{kt-1}$ + β_3 * *GDP per Capita*$_{kt-1}$ + β_4 * *GDP Growth*$_{kt-1}$ + β_5 * *Immigration Rate*$_{kt-1}$ + β_l * *Year*$_{t-1}$ + ε

Hypotheses 1a, 1b and 1c are supported if the coefficients of economic liberalization, β_1, are positive and statistically significant in the analyses of formal, informal, and total entrepreneurship, respectively. Hypothesis 2a is supported if the coefficient of national governance, β_2, is positive and statistically significant in the analysis of formal entrepreneurship. Hypotheses 2b and 2c are supported if the coefficient of national governance is negative and statistically significant in the analyses of informal and total entrepreneurship, respectively.

The data have some limitations of which we need to be aware before discussing the results, but we are making the best use of the limited data available to shed light on this important, understudied, and difficult-to-analyze phenomenon; future research can address some

of these limitations. First, the measures are rough indicators of the concepts analyzed, but we were unable to find better alternatives in the literature, especially of informal entrepreneurship. Hence, we created measures of informal entrepreneurship that, although rough, are a good start for analyzing this important but understudied phenomenon. Second, the models contain different countries and time periods that limit comparability, but when we run the models with only the common years and countries, we obtain equivalent support for the hypotheses. Third, the analyses are at the country level, and thus we do not know exactly how individual entrepreneurs react to structural reform, but we have illustrated the responses of some actual entrepreneurs. Fourth, the analyses focus on the impact of economic liberalization and national governance improvements, but not on their respective sub-indices, because economic liberalization and national governance are systemic constructs. Other studies can focus on the differential impact of each sub-index while holding the rest constant, although this would be a partial analysis of a system. Fifth, we measure entrepreneurship as firm creation and do not assess entrepreneurial-venture success rates. Future research may focus on entrepreneurial-venture survival rates as a response to structural reform, although finding data for this, especially for informal entrepreneurship, may prove particularly challenging.

RESULTS

We provide the summary statistics and correlation matrix in Table 2. We test for multicollinearity using variance inflation factors (VIF) for each of the models and obtain values for all the coefficients well below the commonly used cutoff values of 5 and 10 (Kutner *et al.*, 2004: 409), suggesting that multicollinearity is not a concern in these models.

*** Insert Tables 2 and 3 about here ***

The results, presented in Table 3, support the hypotheses. Hypotheses 1a, 1b, and 1c are supported, because economic liberalization has a positive and statistically significant coefficient in the analyses of formal (model 3b), total (model 3d), and informal (model 3f) entrepreneurship. Hypotheses 2a, 2b, and 2c are also supported because national governance has a positive and statistically significant coefficient in the analysis of formal entrepreneurship (model 3b) and a negative and statistically significant coefficient in the analyses of total (model 3d) and informal (model 3f) entrepreneurship, respectively.

These are novel and important findings that shed new light on the impact of institutions on entrepreneurship. Focusing on each type of entrepreneurship, we find that, for formal entrepreneurship, model 3b indicates that both the impact of economic liberalization and improvements in national governance are positive. This suggests that both of these structural reforms lead to a greater degree of formal entrepreneurship. The coefficients suggest that an increase of one standard deviation in economic liberalization and national governance increases formal entrepreneurship by 3.28 and 13.3 percentage points, respectively.

On the other hand, for informal entrepreneurship, model 3f indicates that the effect of economic liberalization is positive and that of improvements in national governance is negative. The coefficients suggest that an increase of one standard deviation in economic liberalization increases informal entrepreneurship by 2.71 percentage points, whereas an equivalent increase in national governance decreases informal entrepreneurship by 10.8 percentage points. This finding is important as it suggests that improvements in national governance help to discourage informal entrepreneurship, whereas economic liberalization increases it.

Furthermore, for total entrepreneurship, model 3d suggests that economic liberalization has a positive impact and that improvements in national governance have a negative one. The

coefficients suggest that an increase of one standard deviation in economic liberalization increases total entrepreneurship by 2.68 percentage points, whereas an equivalent increase in national governance decreases it by 3.78 percentage points. This finding is also novel and important as it suggests that economic liberalization and national governance improvements result in an increase in formal entrepreneurship that does not compensate for the decrease in the informal one, resulting in an overall decrease in total entrepreneurship.

In sum, the results provide support for the hypotheses. They suggest that economic liberalization has a positive impact on formal, informal, and total entrepreneurship; while national governance improvements have a positive impact on formal entrepreneurship and a negative one on informal and total entrepreneurship. Interestingly, we also find that national governance has a greater overall impact in each case, suggesting that governance improvements may affect entrepreneurship more sharply than economic liberalization does.

Robustness Tests

We perform extensive additional analyses to corroborate the robustness of the results to alternative explanations. We present the results of these analyses in Table 4. The results in each case are consistent with those presented in the main analyses and provide equivalent support for the hypotheses, suggesting that the alternative explanations are not supported and that results are quite robust to the use of alternative methods, measures, and samples.

<div align="center">*** Insert Table 4 about here ***</div>

First, one alternative explanation is that the method we use accounts for the results. We thus test the models using two alternative methods appropriate for panel data: a random-coefficient (RCM) growth model and a time-series generalized estimating equation (GEE) model. First, we run RCM growth models (models 4a, 4c, and 4e) following the guidelines of

Bliese and Ployhart (2002)[4]. Second, we run time-series GEE models with robust standard errors (see models 4b, 4d, and 4f) (Liang and Zeger, 1986).

Second, another alternative explanation is that the findings result from the fact that the different dependent variables cover a dissimilar number and set of countries and a different period of analysis, although they share a great degree of overlap. We thus test the models only including the observations that are common across the three dependent variables (models 4g-4i).

Third, an additional alternative explanation is that the measures we use for the dependent variables account for the results. We thus use alternate measures for formal, informal, and total entrepreneurship. For formal entrepreneurship, we use four additional measures. First, we use the WBGES measure of firm entry as a percentage of the working population (model 4j). Second, we use the WBGES measure of firm entry rate, which refers to the new companies registered as a percentage of total companies in a country in a given year (model 4k) (Klapper *et al.,* 2007; World Bank, 2008a)[5]. Third, from the International Benchmark of Entrepreneurship (IBE), we use the measures of firm entry per capita (model 4l) and firm entry rate (model 4m) (EIM, 2008; Verhoeven and Bruins, 2001). IBE covers 11 developed OECD countries from 1995-2005. As such, it includes a much smaller number of countries than WBGES, but a much longer period of time, providing sufficient observations for longitudinal analyses. As with WBGES, IBE obtains its data primarily from public registries and other sources (e.g., national statistics bureaus, chambers of commerce, Eurostat, Amadeus, Compustat), and therefore captures the formal entrepreneurship of a country.

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[4] RCM is especially suitable for analyzing panel data because it allows for violations of sphericity in the error structure and is robust to missing data (Ployhart, Holtz, and Bliese, 2002). The data is appropriate for RCM because the intraclass correlations [ICC(1)] of 0.82, 0.75, and 0.63 for the dependent variables of formal, total, and informal entrepreneurship, respectively, are well above the suggested cutoff value of 0.10 (Bliese and Ployhart, 2002: 380).

[5] Following the guidelines of Klapper *et al.* (2007) this measure is lagged by one year, as it estimates the new registered firms in a given year as a percentage of the total extant firms in the previous year. Therefore, the resulting model contains fewer observations than the models obtained with the other WBGES measures.

For total entrepreneurship, we use two additional measures. First, we use the GEM (2008) measure of nascent entrepreneurial activity (NEA) (model 4n). The measure we use in the main analyses – TEA – includes the percentage of the working age population that is (1) in the process of setting up a formal or informal business or (2) owns one that is up to 3.5 years old. One may argue that only the first part of this measure should be included in order to capture only the new entrepreneurship in a given year. We therefore run the analyses with NEA, which only includes this first part. Second, we use the Compendia database measure of the total business ownership rate (EIM, 2008; van Stel, 2003, 2005), which is the number of formal and informal business owners divided by the total labor force (in hundreds) in a given country and year (model 4o)[6]. The Compendia dataset covers 23 developed OECD countries from 1970-2006[7]. Compendia draws its data primarily from the OECD Labor Force Statistics (e.g., OECD, 2007), which obtains the data mainly via labor force surveys and household surveys, typically conducted by the government of each country. The OECD, in turn, uses the ILO (1982) definition of self-employment, which encompasses all "persons who during the reference period performed some work for profit or family gain, in cash." As ILO (2002a: 18) explains, measuring self-employment in this way includes formal and informal self-employment.

For informal entrepreneurship, we use two additional measures generated in this paper (appendix A). First, we use the informal entrepreneurship index (IEI) - estimate 2 (model 4p). Second, we use the informal economy index, using all of the years (1995-2007) and countries

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[6] Compendia measures the total business ownership rate, which is not the same as total new businesses created. However, these are closely related constructs (van Stel, 2003, 2005). Furthermore, Compendia breaks up the data into agricultural, non-agricultural, and total business ownership. We use the latter in the analysis presented in model 4o, but we also run the models for only agricultural and for only non-agricultural business ownership and obtain very similar results and equivalent support for the hypotheses.

[7] Given that IBE and Compendia only include data on developed countries, using these measures also provides evidence for the notion that the results are not only applicable to developing countries, where informal economic activity is more widespread (ILO, 2002).

(102) available (model 4q)[8]. The results of this last analysis suggest that the findings may be applicable not only to informal entrepreneurship, but to informal business activity in general.

Fourth, another alternative explanation is that the measures we use for the independent variables account for the results. For economic liberalization, we use three additional measures. First, we use the complete Fraser Institute Economic Freedom of the World Index (models 4r, 4u, and 4x) (Gwartney *et al.,* 2007). This measure covers 141 countries and is available at five-year intervals for 1970-2000 and annually thereafter. It is an aggregate of five sub-indices or areas: freedom to trade internationally; size of government; regulation of credit, labor, and business; and legal structure and security of property rights. Second, as the last of these sub-indices (property rights) is a measure of national governance, we remove it and use the index based on the remaining four sub-indices, as we did with the Heritage index in our main analyses (models 4s, 4v, and 4y). Third, we use the complete Heritage measure (models 4t, 4w, and 4z) (Holmes *et al.,* 2008), instead of the one composed of only seven sub-indices, which we use in the main analyses. Likewise, for national governance improvement we use three alternative measures. First, we use the indicator we removed from the Fraser Institute index that represents national governance: property rights (models 4aa, 4ad, and 4ag) (Gwartney *et al.,* 2007). Second, we use, separately, the two sub-indices we removed from the Heritage index that represent key aspects of national governance: property rights (models 4ab, 4ae, and 4ah) and freedom from corruption (models 4ac, 4af, and 4ai) (Holmes *et al.,* 2008). We use two alternative measures of national development instead of GDP per capita, which we use in the main analyses. First, we

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[8] As we describe in appendix A, we used Schneider and Enste's (2000) estimates of the informal economy as our baseline year estimates. For the countries not covered we used their regional average, because we could not find alternative estimates in the literature. To check whether this procedure affects the results we run the analyses without these countries and obtain very similar results and equivalent support for the hypotheses. Furthermore, we run the models only for the years 2000-2007 (to be consistent with the years covered in the main analyses), and once again obtain very similar results and equivalent support for the hypotheses.

use GNI per capita. Second, we use the Human Development Index or HDI (United Nations, various years), which is a composite measure of life expectancy, literacy and education, and GDP per capita. Each of these could have an impact on entrepreneurship, so it is important to take them into account. HDI includes harmonized data from 1997 to 2005. As some of our models include data outside this date range, we did not include this variable in the main analyses.

In sum, the results using each of the alternative specifications are consistent with those presented and afford equivalent support for the hypotheses, suggesting that the results are quite robust to the use of alternative methods, measures, and samples.

CONCLUSIONS

This paper analyzes the impact of structural reform on formal, informal, and total entrepreneurship. We argue that the two key elements of structural reform, economic liberalization and improvements in national governance (Fukuyama, 2004; Williamson, 1990, 2004), affect formal, informal, and total entrepreneurship in different ways. Economic liberalization tends to have a positive impact on the three types, because it provides incentives and increases opportunities for formal and informal enterprise creation. On the other hand, improvements in national governance have a positive impact on formal entrepreneurship, but a negative one on informal entrepreneurship, because strengthening the legal and regulatory economic environment reduces transaction costs, benefiting formal and constraining informal entrepreneurship. Furthermore, national governance improvements reduce total entrepreneurship, because better regulations incentivize not only the creation of more formal enterprises but also lead to better labor regulations, inducing many potential formal entrepreneurs to join the labor force instead. The statistical tests of the hypotheses, using various measures and methods, provide robust support for these arguments.

The arguments and findings have several important implications. First, for researchers, this paper provides a new avenue of potential research. It builds on institutional economics (North, 1990) to explain the impact of institutions on entrepreneurship. Specifically, the paper explains how structural reform – a type of institutional change – affects formal, informal, and total entrepreneurship differently. This complements previous studies of institutions on firms (e.g., Bevan *et al.*, 2004; Henisz, 2000; Peng, 2003) by discussing how the same set of institutions has a dissimilar impact on different types of firms. It provides a boundary condition on the theoretical argument that improvements in institutions support economic development by explaining that not all institutional improvements support all types of entrepreneurship. Moreover, the paper contributes to the entrepreneurship literature by providing a better understanding of how institutions impact entrepreneurship, an area that has received some recent attention (Bjørnskov and Foss, 2008; Freytag and Thurik, 2007; Klapper *et al.,* 2007; Nyström, 2008; Sobel *et al.*, 2007) but that is in need of additional analyses. Formal entrepreneurship has been the focus of most research on entrepreneurship because it is easier to measure and because most entrepreneurship research has focused on developed countries where informal entrepreneurship is not as prevalent. As such, the important topic of informal entrepreneurship and the analysis of entrepreneurship in developing countries has received relatively little attention (Ahlstrom and Bruton, 2006; Bruton, Ahlstrom, and Obloj, 2008; Busenitz, Gómez, and Spencer, 2000; Young *et al.*, 2008). We contribute to this literature by explaining the differential impact of institutions on different types of entrepreneurship. We also contribute by providing measures of informal entrepreneurship, which despite its difficulty in measuring, is an important component of entrepreneurship in developing countries.

Second, for policy-makers, the paper suggests that if they lead their countries towards economic liberalization and national governance improvements, total entrepreneurship may decrease. This may appear puzzling and may result in criticisms of structural reform, which is currently under debate as part of the broader discussion on the benefits of globalization (e.g., Bhagwati, 2004; Guillén, 2001; Henisz, Zelner, and Guillén, 2005; Mander and Goldsmith, 1996; Stiglitz, 2003). The paper explains that such criticisms may be misplaced. Economic liberalization and national governance improvements encourage formal entrepreneurship and discourage informal entrepreneurship, with some of the former informal entrepreneurs likely joining the labor market as employees. The findings provide some evidence to justify the reforms that government administrators may wish to institute to incentivize formal and discourage informal entrepreneurship. Increasing legal registration of entrepreneurial ventures formally expands the economy, provides accurate economic data, and increases the taxation base.

Third, for entrepreneurs, the paper provides a better understanding of the costs and benefits of structural reform. Economic liberalization is beneficial for both formal and informal entrepreneurship, while national governance improvements support formal while limiting informal and total entrepreneurship. This does not mean that these improvements are detrimental for entrepreneurship, but that those entrepreneurs who were induced towards informality because of the high transaction costs of inadequate national governance may either create formal enterprises or rejoin the workforce via formal employment as national governance improves.

In sum, the paper contributes to a better understanding of the impact of institutions on formal, informal, and total entrepreneurship, moving from single- to multi-country studies. This has some data limitations but nevertheless provides new insights that help advance theory and knowledge of this important and understudied phenomenon.

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Table 1. Variables, measures, and sources of data

Variable	Measure	Source
Formal entrepreneurship	Entry per capita: Registered firms in a given year as a percentage of the total population (in tens of thousands)	World Bank Group Entrepreneurship Survey (Klapper *et al.*, 2007)
Total entrepreneurship	Total entrepreneurial activity (TEA): Percentage of the working age population that is in the process of setting up a formal or informal business or owns one that is up to 3.5 years old	Global Entrepreneurship Monitor (GEM, 2008)
Informal entrepreneurship	Informal entrepreneurship index (IEI, estimate 1): Estimate of informal entrepreneurship as a percentage of the informal economy	Developed in this article (see appendix A)
Economic liberalization	Index of economic freedom	Heritage Foundation (Holmes *et al.*, 2008)
National governance	National governance composite measure	World Bank's Governance Matters VI (Kaufmann *et al.*, 2007)
GDP per capita	Gross domestic product in thousands of US$ divided by total population	World Development Indicators (World Bank, 2008b)
GDP growth	Percentage increase in gross domestic product from one year to the next	World Development Indicators (World Bank, 2008b)
Immigration	Immigration as a percentage of the total population	World Development Indicators (World Bank, 2008b)
Year	Indicator of the year of analysis	-

Table 2. Descriptive statistics and correlation matrix

Variable	Mean	s.d.	1	2	3	4	5	6	7
1. Formal entrepreneurship	21.72	29.41							
2. Total entrepreneurship	9.01	6.10	0.23						
3. Informal entrepreneurship	24.46	11.68	-0.32	0.29					
4. Economic liberalization	0.00	1.00	0.29	0.31	-0.11				
5. National governance	0.00	1.00	0.48	-0.26	-0.51	0.34			
6. GDP per capita	0.00	1.00	0.00	-0.04	-0.09	-0.12	0.05		
7. GDP growth	0.00	1.00	0.07	0.01	0.05	0.20	-0.10	0.06	
8. Immigration	0.00	1.00	0.10	0.03	-0.08	0.47	0.15	-0.31	0.16

Correlations greater than |0.21| are significant at alpha=0.05 (2-tailed).

Correlations for the year categorical variables are omitted in the interest of brevity.

The continuous independent variables are centered and standardized and thus show a mean of 0 and standard deviation of 1.

Table 3. Hypothesis tests: Results of the random-effects GLS analyses with correction for heteroskedasticity and panel-specific autocorrelation of the impact of economic liberalization and improvements in national governance on formal, informal, and total entrepreneurial activity

Variable	Formal Entrepreneurship		Total Entrepreneurship		Informal Entrepreneurship	
	Model 3a	Model 3b	Model 3c	Model 3d	Model 3e	Model 3f
Intercept	27.03 *** (0.70)	18.09 *** (0.54)	9.32 *** (0.34)	10.52 *** (0.41)	27.55 *** (0.44)	41.26 *** (1.35)
GDP per capita	0.52 (1.09)	-0.78 * (0.31)	1.04 (0.60)	-0.03 (0.06)	-2.15 *** (0.49)	-2.84 *** (0.54)
GDP growth	-0.38 (0.22)	0.50 (0.26)	0.17 (0.35)	0.03 (0.26)	1.90 (0.98)	1.29 ** (0.44)
Immigration	14.69 *** (0.72)	2.82 *** (0.62)	-2.25 *** (0.22)	-2.80 *** (0.35)	-4.33 *** (0.76)	-2.48 *** (0.74)
Year control[a]	Included	Included	Included	Included	Included	Included
Economic liberalization	---	3.28 *** (0.37)	---	2.68 *** (0.24)	---	2.71 *** (0.80)
National governance	---	13.30 *** (0.56)	---	-3.78 *** (0.19)	---	-10.80 *** (0.83)
Observations[b] (n)	296	296	256	256	74	74
Countries (groups)	77	77	47	47	27	27
Wald χ^2	980.85 ***	1215.37 ***	254.22 ***	7587.86 ***	124.02 ***	1813.70 ***

[a] Indicators for the year are included in the models but their coefficients are not reported for the sake of parsimony.

[b] The number of observations and countries covered varies depending on the availability of data for each dependent variable.

Standard errors appear in parentheses. Significance levels (2-tailed): *$p<0.05$, **$p<0.01$, ***$p<0.001$.

Table 4. Robustness tests (sources appear in parentheses)

	Alternate methods: RCM growth model & time-series GEE						Only countries covered by the three DVs		
	Formal Entrepreneurship		Total Entrepreneurship		Informal Entrepreneurship		Formal Entrep.	Total Entrep.	Informal Entrep.
	Model 4a	Model 4b	Model 4c	Model 4d	Model 4e	Model 4f	Model 4g	Model 4h	Model 4i
Variable	RCM Growth Model	Time-series GEE	RCM Growth Model	Time-series GEE	RCM Growth Model	Time-series GEE	Time-series GLS	Time-series GLS	Time-series GLS
Intercept	19.32 *** (2.35)	18.80 *** (3.42)	16.05 *** (0.89)	16.15 *** (1.38)	35.24 *** (2.71)	36.94 *** (3.07)	11.04 *** (3.00)	7.06 *** (0.74)	41.26 *** (1.35)
GDP per capita	-1.30 (3.85)	1.17 (4.08)	0.84 (0.99)	0.26 (0.31)	-1.42 (3.42)	-1.91 (2.61)	-0.07 (3.98)	1.66 * (0.71)	-2.84 *** (0.54)
GDP growth	0.11 (2.42)	-0.44 (0.68)	-0.89 (0.76)	-0.66 * (0.32)	0.82 (2.94)	1.24 (0.84)	0.06 (1.31)	-1.12 * (0.46)	1.29 ** (0.44)
Immigration rate	8.82 * (3.84)	3.40 (5.23)	-1.39 (1.00)	-1.37 * (0.60)	-0.21 (3.36)	-4.70 (2.73)	-4.00 (2.05)	-0.49 (0.61)	-2.48 *** (0.74)
Year control[a]	Included	Included	Included	Included	Included	Included	Included	Included	Included
Economic freedom	5.31 * (2.49)	2.95 * (1.51)	2.34 *** (0.76)	2.04 * (0.90)	6.21 * (2.85)	6.90 ** (2.30)	7.57 *** (2.14)	2.94 *** (0.47)	2.71 *** (0.80)
National governance	12.49 *** (2.19)	11.95 ** (4.59)	-5.56 *** (0.74)	-5.10 *** (1.04)	-7.56 *** (1.93)	-9.82 *** (2.21)	10.58 *** (2.06)	-1.72 *** (0.47)	-10.80 *** (0.83)
Observations[b] (n)	300	300	266	266	80	74	74	74	74
Countries (groups)	81	81	57	57	33	27	27	27	27
Wald χ^2	101.58 ***	57.38 ***	109.96 ***	153.39 ***	23.07 ***	99.05 ***	102.97 ***	70.42 ***	1813.70 ***

[a] Indicators for the year are included in the models but their coefficients are not reported for the sake of parsimony.

[b] The number of observations and countries covered varies depending on the availability of data for each dependent variable.

All models are random-effects GLS analyses with correction for heteroskedasticity and panel-specific autocorrelation, except models 4a-4f.

Standard errors appear in parentheses. Significance levels (2-tailed): *p<0.05, **p<0.01, ***p<0.001.

Table 4 (continued). Robustness tests (sources appear in parentheses)

	Alternate dependent variables							
	Alternate measures of Formal Entrepreneurship				Alternate measures of Total Entrepreneurship		Alternate measures of Informal Entrep.	
	Model 4j	Model 4k	Model 4l	Model 4m	Model 4n	Model 4o	Model 4p	Model 4q
Variable	New registered firms as percent of working population (World Bank)	New registered firms as percent of total registered firms (World Bank)	New registered firms as percent of total population (IBE)	New registered firms as percent of total registered firms (IBE)	Percent of working age population in the process of setting up a formal or informal business (GEM)	Total formal and informal business owners as percent of labor force (COMPENDIA)	Informal entrepreneurship index, estimate 2 (appendix 1)	Informal economy index, estimate (appendix 1)
Intercept	40.85 *** (1.06)	8.35 *** (0.12)	-25.14 (13.26)	6.24 *** (1.40)	6.18 *** (0.33)	27.84 *** (0.64)	39.52 *** (1.63)	46.64 *** (0.90)
GDP per capita	-2.26 *** (0.52)	-0.36 *** (0.05)	28.48 *** (5.49)	-0.61 (0.34)	-0.14 (0.08)	-2.63 *** (0.34)	-3.14 *** (0.53)	5.25 *** (0.79)
GDP growth	0.73 (0.47)	0.42 *** (0.12)	6.48 * (2.56)	1.38 *** (0.42)	-0.08 (0.24)	0.48 * (0.22)	0.50 (0.52)	-0.38 (0.26)
Immigration rate	8.26 *** (1.40)	-0.63 *** (0.17)	13.76 * (6.43)	1.80 (1.28)	-1.24 *** (0.24)	-1.54 *** (0.37)	-2.40 ** (0.79)	-6.31 *** (1.13)
Year control[a]	Included	Included	Included	Included	Included	Included	Included	Included
Economic freedom	7.37 *** (0.74)	0.52 *** (0.13)	9.04 *** (2.34)	1.35 *** (0.35)	1.20 *** (0.20)	1.21 *** (0.22)	2.62 *** (0.71)	4.29 *** (0.49)
National governance	24.71 *** (1.03)	1.66 *** (0.11)	10.08 * (5.01)	2.32 *** (0.90)	-2.39 *** (0.19)	-9.29 *** (0.39)	-10.46 *** (1.04)	-18.86 *** (0.72)
Observations[b] (n)	296	204	97	94	229	184	74	926
Countries (groups)	77	69	11	11	46	23	27	105
Wald χ^2	1910.33 ***	720.99 ***	217.36 ***	153.45 ***	526.51 ***	1265.88 ***	1085.29 ***	2351.02 ***

[a] Indicators for the year are included in the models but their coefficients are not reported for the sake of parsimony.

[b] The number of observations and countries covered varies depending on the availability of data for each dependent variable.

All models are random-effects GLS analyses with correction for heteroskedasticity and panel-specific autocorrelation, except models 4a-4f.

Standard errors appear in parentheses. Significance levels (2-tailed): *$p<0.05$, **$p<0.01$, ***$p<0.001$.

Table 4 (continued). Robustness tests (sources appear in parentheses)

Variable	Formal Entrepreneurship			Total Entrepreneurship			Informal Entrepreneurship		
	Model 4r	Model 4s	Model 4t	Model 4u	Model 4v	Model 4w	Model 4x	Model 4y	Model 4z
	Economic Freedom of the World, full measure (Fraser)	Economic Freedom of the World, partial measure (Fraser)	Index of Economic Freedom, full measure (Heritage)	Economic Freedom of the World, full measure (Fraser)	Economic Freedom of the World, partial measure (Fraser)	Index of Economic Freedom, full measure (Heritage)	Economic Freedom of the World, full measure (Fraser)	Economic Freedom of the World, partial measure (Fraser)	Index of Economic Freedom, full measure (Heritage)
Intercept	13.14 *** (0.45)	17.06 *** (0.54)	18.14 *** (0.52)	12.25 *** (0.29)	11.62 *** (0.27)	14.37 *** (0.37)	41.22 *** (1.45)	36.16 *** (1.47)	36.29 *** (1.46)
GDP per capita	-0.31 (0.80)	-0.21 (0.75)	-0.74 ** (0.27)	-0.02 (0.41)	-0.06 (0.26)	-0.15 * (0.06)	-1.67 * (0.69)	-2.21 ** (0.71)	-2.03 ** (0.76)
GDP growth	0.21 (0.28)	0.26 (0.28)	0.45 (0.25)	-0.14 (0.28)	-0.01 (0.29)	0.00 (0.25)	1.47 *** (0.41)	1.32 *** (0.40)	1.40 *** (0.42)
Immigration rate	3.63 *** (0.81)	3.76 *** (0.81)	2.27 *** (0.62)	-1.98 *** (0.20)	-2.04 *** (0.23)	-2.95 *** (0.31)	-1.89 *** (0.44)	-1.77 *** (0.53)	-2.12 ** (0.69)
Year control[a]	Included	Included	Included	Included	Included	Included	Included	Included	Included
Economic freedom	0.94 * (0.44)	0.68 * (0.34)	5.25 *** (0.50)	3.79 *** (0.30)	3.01 *** (0.25)	4.08 *** (0.25)	3.01 *** (0.62)	1.84 *** (0.53)	2.82 ** (1.09)
National governance	13.47 *** (0.63)	13.90 *** (0.56)	10.50 *** (0.54)	-5.94 *** (0.17)	-4.66 *** (0.11)	-5.57 *** (0.16)	-11.58 *** (0.80)	-10.46 *** (0.85)	-11.42 *** (0.97)
Observations[b] (n)	270	270	296	197	197	256	74	74	74
Countries (groups)	70	70	77	43	43	47	27	27	27
Wald χ^2	1532.76 ***	1481.90 ***	1021.45 ***	5758.84 ***	5865.39 ***	7763.67 ***	832.52 ***	666.45 ***	638.40 ***

[a] Indicators for the year are included in the models but their coefficients are not reported for the sake of parsimony.

[b] The number of observations and countries covered varies depending on the availability of data for each dependent variable.

All models are random-effects GLS analyses with correction for heteroskedasticity and panel-specific autocorrelation, except models 4a-4f.

Standard errors appear in parentheses. Significance levels (2-tailed): *p<0.05, **p<0.01, ***p<0.001.

Table 4 (continued). Robustness tests (sources appear in parentheses)

	Alternate independent variables: Alternate measures of improvements in national governance								
	Formal Entrepreneurship			Total Entrepreneurship			Informal Entrepreneurship		
	Model 4aa	Model 4ab	Model 4ac	Model 4ad	Model 4ae	Model 4af	Model 4ag	Model 4ah	Model 4ai
Variable	Property rights protection (Fraser)	Property rights protection (Heritage)	Corruption (Heritage)	Property rights protection (Fraser)	Property rights protection (Heritage)	Corruption (Heritage)	Property rights protection (Fraser)	Property rights protection (Heritage)	Corruption (Heritage)
Intercept	20.11 *** (0.68)	18.18 *** (0.73)	19.46 *** (0.38)	7.94 *** (0.43)	12.94 *** (0.46)	8.78 *** (0.54)	32.13 *** (0.42)	35.88 *** (0.88)	37.60 *** (1.11)
GDP per capita	-0.75 (0.61)	6.20 *** (0.85)	-0.29 (0.31)	-0.05 (0.06)	-2.49 *** (0.33)	-0.01 (0.15)	-4.87 *** (0.40)	-4.94 *** (0.59)	-2.39 * (1.21)
GDP growth	1.07 ** (0.41)	0.37 (0.28)	0.89 ** (0.30)	-0.21 (0.31)	0.10 (0.27)	0.18 (0.37)	0.19 (0.30)	-0.18 (0.27)	-0.98 *** (0.21)
Immigration rate	7.43 *** (0.95)	1.01 * (0.49)	4.36 *** (0.65)	-2.59 *** (0.37)	-2.01 *** (0.45)	-2.69 *** (0.47)	0.77 (0.51)	-0.11 (0.73)	-1.87 (1.26)
Year control[a]	Included	Included	Included	Included	Included	Included	Included	Included	Included
Economic freedom	4.54 *** (0.55)	2.89 *** (0.39)	3.12 *** (0.41)	2.31 *** (0.26)	2.81 *** (0.19)	2.42 *** (0.32)	1.34 *** (0.36)	2.75 *** (0.59)	4.75 *** (1.31)
National governance	8.40 *** (0.58)	7.46 *** (0.82)	10.89 *** (0.42)	-2.42 *** (0.21)	-0.80 * (0.32)	-2.14 *** (0.26)	-3.31 *** (0.23)	-3.41 *** (0.54)	-10.22 *** (0.85)
Observations[b] (n)	270	296	296	197	256	256	74	74	74
Countries (groups)	70	77	77	43	47	47	27	27	27
Wald χ^2	825.97 ***	834.06 ***	1012.31 ***	1349.71 ***	1752.71 ***	362.61 ***	8535.50 ***	382.81 ***	646.97 ***

[a] Indicators for the year are included in the models but their coefficients are not reported for the sake of parsimony.

[b] The number of observations and countries covered varies depending on the availability of data for each dependent variable.

All models are random-effects GLS analyses with correction for heteroskedasticity and panel-specific autocorrelation, except models 4a-4f.

Standard errors appear in parentheses. Significance levels (2-tailed): *p<0.05, **p<0.01, ***p<0.001.

APPENDIX A
GENERATING LONGITUDINAL MEASURES OF THE INFORMAL ECONOMY AND OF INFORMAL ENTREPRENEURSHIP

This appendix describes how we generate the measures of the informal economy and informal entrepreneurship. First, we explain how we create an informal economy index - which covers 102 countries and the period 1990-2005 – following the guidelines of Schneider and Enste (2000) and data from Kaufmann and Kaliberda (1996). Second, we describe how we produce a first estimate of the informal entrepreneurship index (IEI), based on the informal economy index and data from GEM (2008) and Klapper *et al.* (2007). Third, we discuss how we create a second estimate of IEI solely using data from GEM (2008) and Klapper *et al.* (2007). Both estimates of IEI cover 33 countries for the years 2003-2005.

Informal Economy Index

We first generate a measure of the informal economy in order to then use it to estimate informal entrepreneurship. We generate the measure of the informal economy following the guidelines of Kaufmann and Kaliberda (1996). In that article, the authors produce an informal economy index, but only for a single country (Ukraine) and for the years 1989-1994. We extend their informal economy index to cover a larger number of countries and years.

Kaufmann and Kaliberda (1996) use the electricity consumption method to generate their estimate of the informal economy. Although there are a number of different methods that have been used to estimate the informal economy (for a review, see Schneider and Enste, 2000), the electricity consumption method has the advantage of providing a good estimate of the informal economy while being easily generalizable across countries and time-periods. This method is based on the notion that official GDP only captures formal economic activity, whereas electricity consumption captures the total economic activity of a country[9]. Hence, the size of the informal economy may be calculated by subtracting the total economic activity from the formal one.

The following are the steps to calculate the size of the informal economy: First, we collect data for total electricity consumption and official GDP (World Bank, 2008b). We do so for all the years since 1990 and all the countries available. With this data, we calculate the annual growth rate in electricity consumption and the annual growth rate in GDP.

Second, we create a total economy index, which captures the growth in total economic activity from one year to the next[10]. This index equals 100 for 1990 and for each subsequent year is the sum between the annual growth rate in electricity consumption in that year and the index for the previous year. For example, in 1991 and 1992 Argentina had a 4.8% and 6.1% growth in electricity consumption, respectively. Therefore, the total economy index for Argentina is 100 for 1990, 104.8 (i.e., 100+4.8) for 1991, and 110.9 (i.e., 104.8+6.1) for 1992.

Third, in order to calculate the informal and formal economy indices, we require a baseline estimate of the informal economy for a given year. For the Ukraine, Kaufmann and Kaliberda (1996) use the average of several estimates provided by previous literature for the year 1989. They therefore use the year 1989 as their baseline year and settle on 12% as their baseline estimation of the informal economy for that year. In order to imitate this approach, we obtain our

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[9] Based on empirical observations throughout the globe, electricity consumption and total economic activity typically move in lockstep with an elasticity of electricity to GDP close to one (Kaufmann and Kaliberda, 1996: 10; Schneider and Enste, 2000: 34).

[10] We do not provide a table with the data for the total economy index because it is the sum of the formal economy index and the informal economy index, which we provide in tables 4 and 5, respectively.

baseline year from Schneider and Enste (2000), who provide various estimates for the year 1990 for 76 countries. We use the average of the estimates provided for each country as our baseline estimates of the informal economy for 1990. For the countries that are not included in Schneider and Enste (2000) but are covered by our independent variables of interest, we use the average of the estimates for the region or group of countries as categorized by those authors. For example, Schneider and Enste (2000) do not provide an estimate of the size of the informal economy for El Salvador and Dominican Republic, so we use the average of the estimated size of the informal economy for all Latin-American countries[11].

Fourth, we calculate the formal economy index, which represents the growth in formal economic activity from one year to the next. We begin by calculating the baseline year, which is the value for the total economy index for 1990 (i.e., 100) minus the baseline estimate of the informal economy for 1990. For example, the 1990 baseline estimate for the informal economy in Argentina is 21.8. Therefore, the difference between 100 and 21.8 (78.2) represents the formal economy index for that year. For the subsequent years, the formal economy index is calculated as the sum of the official GDP growth in that year and the index for the previous year. For example, in 1991 and 1992 Argentina had a 12.7% and 11.9% official GDP growth in official GDP, respectively. Therefore, the formal economy index for Argentina is 78.2 for 1990, 90.9 (i.e., 78.2+12.7) for 1991, and 102.8 (i.e., 90.9+11.9) for 1992. Table A provides the estimates for the formal economy index.

*** Insert Table A about here ***

Fifth, we calculate the informal economy index, which represents the growth in informal economic activity from one year to the next. This index is simply the difference between the total economy index and the formal economy index for a given year. For example, the informal economy index for Argentina is 21.8 (i.e., the baseline estimate) for 1990, 13.9 (i.e., 104.8-90.9) for 1991, and 8.1 (i.e., 110.9-102.8) for 1992. Table B provides the estimates for the informal economy index.

*** Insert Table B about here ***

From the formal and informal economy indices, we can then easily calculate the share of the economy that is formal and the share that is informal in any given year (Kaufmann and Kaliberda, 1996). In this case, the sum of the formal and informal shares of the economy should add to 100 for each year. For example, the share of the informal and formal economy for Argentina for 1991 is 21.8 and 78.2 (respectively) and for 1992 is 13.3 and 86.7 (respectively). These measures therefore do not capture the growth in each of the variables over time, but the change of the relative share of formal and informal economic activity. As such, we do not use these measures directly in our analyses, but we do use them to calculate the IEI measure below because they are directly comparable across countries.

Informal Entrepreneurship Index (IEI)

In order to estimate the IEI for a given country and year, we need to calculate the share of the informal economy that represents entrepreneurship. One way to do so is to first remove from the estimate of the total economy the portion that does not represent entrepreneurship, then to remove from the estimate of the formal economy the portion that does not represent entrepreneurship, and finally to subtract the former from the latter. For example, let us say that the share of the total economy for a given country is 100 and the share of the formal economy for

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[11] Note that in our robustness tests, we use the informal economy measure both with and without the countries for which we use the average of the region and obtain very similar results and equivalent support for the hypotheses.

that country is 80. Furthermore, let us say that the percentage of the total economy that represents entrepreneurship is 10%, while the share of the formal economy that represents entrepreneurship is 5%. We would therefore multiply 100 x 0.10 and subtract from it 80 x 0.05. 100 x 0.10, which equals 10, gives us the total entrepreneurship as a percentage of the total economy. 80 times 0.05, which equals 4, gives us the formal entrepreneurship as a percentage of the formal economy. The difference between them (10-4=6) is therefore the informal entrepreneurship as a percentage of the informal economy.

These are the steps we follow to calculate this measure: First, we calculate the ratio of the total economy that represents entrepreneurship by using data from GEM (2008). GEM provides data on nascent entrepreneurial activity (NEA) and total business activity (TBA). We divide NEA by TBA and obtain an estimate of total entrepreneurship as a percentage of the total economy; we refer to this measure as total entrepreneurship entry rate. Although the GEM measures are provided in terms of population, by calculating the ratio of new to established business activity, we are able to convert it to a form that is comparable to the measure below. Second, we use Klapper *et al.*'s (2007) measure of entry rate to capture the ratio of the formal economy that represents entrepreneurship. This measure captures the new registered firms in a given year as a percentage of the total extant firms in the previous year. It therefore provides an estimate of the formal entrepreneurship as a percentage of the formal business activity; we refer to this measure as formal entrepreneurial entry rate. Once again, although this measure is provided in terms of firms, by converting it to the ratio of new to extant formal entrepreneurship, it becomes comparable to the measure above. Third, we estimate the percentage of the total economy that represents entrepreneurship. We do so by multiplying the total economy share (100) by the total entrepreneurial entry rate. Fourth, we calculate the percentage of the formal economy that represents entrepreneurship. We do so by multiplying the formal economy share by the formal entrepreneurial entry rate. Fifth, we compute the IEI (estimate 1) by subtracting the percentage of the total economy that represents entrepreneurship from the percentage of the formal economy that represents entrepreneurship. We do so for all of the countries and years for which data is available. Table C provides the estimates for IEI.

*** Insert Table C about here ***

Furthermore, we calculate a second estimate of IEI by simply subtracting the total entrepreneurial entry rate from the formal entrepreneurial entry rate. This measure therefore is solely constructed using data from GEM (2008) and Klapper *et al.* (2007). That is, we do not use the informal economy measures we generated in the previous section for this index. However, the two measures are quite similar and are highly correlated, suggesting that they indeed capture the same construct.

Table A. Formal economy index [a]

	Country[b]	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
1	Albania*	82.4	54.9	47.7	57.3	66.7	75.6	84.7	74.5	87.2	97.3	104.6	111.6	114.5	120.2	126.1	131.6
2	Algeria*	60.6	59.4	61.2	59.1	58.2	62.0	66.1	67.2	72.3	75.5	77.7	80.3	85.0	91.9	97.1	102.2
3	Angola*	60.6	59.4	52.5	27.8	31.3	41.7	52.9	60.8	67.6	70.8	73.9	77.0	91.5	94.8	106.0	126.6
4	Argentina	78.2	90.9	102.8	108.7	114.6	111.7	117.2	125.3	129.2	125.8	125.0	120.6	109.7	118.6	127.6	136.8
5	Australia	86.3	85.7	85.8	89.4	93.5	98.0	102.1	106.0	110.5	115.7	119.7	121.6	125.4	128.5	132.6	135.3
6	Austria	89.4	93.0	95.4	95.7	98.4	100.3	102.9	104.7	108.3	111.6	115.0	115.8	116.7	117.8	120.2	122.2
7	Bahrain*	66.1	77.3	84.0	96.9	96.6	100.6	104.7	107.8	112.6	116.9	122.2	126.8	132.0	139.2	144.8	152.6
8	Bangladesh*	66.1	69.4	74.5	79.1	83.1	88.1	92.7	98.1	103.3	108.2	114.1	119.4	123.8	129.1	135.3	141.3
9	Belgium	80.9	82.7	84.2	83.3	86.5	88.9	90.1	93.6	95.3	98.7	102.4	103.2	104.7	105.7	108.7	109.7
10	Benin*	60.6	65.3	69.3	72.9	77.2	81.8	87.4	93.5	98.1	102.8	108.6	113.6	118.1	122.0	125.1	128.0
11	Bolivia	34.4	39.7	41.3	45.6	50.2	54.9	59.3	64.2	69.3	69.7	72.2	73.9	76.4	79.1	83.3	87.7
12	Botswana	73.0	80.5	83.4	85.3	88.9	93.3	98.9	109.0	119.6	126.8	135.1	140.3	146.0	152.0	158.1	163.0
13	Brazil	66.6	67.5	67.2	71.8	77.2	81.6	83.7	87.0	87.0	87.3	91.6	92.9	95.5	96.8	102.5	105.4
14	Bulgaria	75.0	66.5	59.2	57.8	59.6	62.4	53.0	47.4	51.4	53.7	59.1	63.2	67.7	72.7	79.3	85.5
15	Cameroon*	60.6	56.8	53.7	50.5	48.0	51.3	56.3	61.4	66.4	70.8	75.0	79.5	83.5	87.6	91.3	93.6
16	Canada	88.1	86.0	86.9	89.2	94.0	96.8	98.5	102.7	106.8	112.3	117.5	119.3	122.3	124.1	127.4	130.3
17	Chile	72.4	80.4	92.6	99.6	105.3	116.0	123.4	130.0	133.2	132.5	136.9	140.3	142.5	146.4	152.5	158.0
18	China*	66.1	75.3	89.5	103.5	116.6	127.5	137.5	146.8	154.6	162.2	170.6	178.9	188.0	198.0	208.1	218.5
19	Colombia	70.0	72.2	77.3	79.6	85.5	90.7	92.7	96.1	96.7	92.5	95.4	96.9	98.8	102.7	107.6	112.3
20	Congo, Dem. Rep.*	60.6	52.2	41.7	28.2	24.3	25.0	24.0	18.4	16.7	12.5	5.6	3.5	6.9	12.7	19.4	25.8
21	Congo, Rep.*	60.6	63.0	65.6	64.6	59.1	63.1	67.4	66.8	70.5	67.9	75.5	79.3	84.1	85.8	89.4	97.1
22	Costa Rica	71.4	74.0	83.1	90.5	95.3	99.2	100.1	105.7	114.1	122.3	124.1	125.2	128.0	134.4	138.7	144.7
23	Croatia	77.2	56.1	44.4	36.4	42.3	49.1	55.0	61.8	64.3	63.5	66.3	70.8	76.3	81.7	85.9	90.2
24	Cyprus	79.0	79.7	89.1	89.8	95.7	101.8	103.7	106.0	111.1	115.9	121.0	125.0	127.1	129.0	133.2	137.1
25	Czech Republic	85.3	73.7	73.2	73.2	75.5	81.4	85.4	84.7	83.9	85.3	88.9	91.4	93.3	96.9	101.5	107.9
26	Denmark	85.7	87.0	89.0	88.9	94.4	97.5	100.3	103.5	105.7	108.2	111.7	112.4	112.9	113.3	115.4	118.5
27	Dominican Republic*	61.8	62.7	70.7	73.7	78.0	82.7	89.8	98.0	105.4	113.6	121.7	125.3	129.8	127.9	129.9	139.1
28	Ecuador	68.8	74.0	75.5	75.8	80.5	82.3	84.7	88.7	90.8	84.5	87.3	92.7	96.9	100.5	108.5	114.5
29	Egypt, Arab Rep.	32.0	33.1	37.5	40.3	44.4	49.0	54.0	59.5	63.5	69.6	75.0	78.5	81.7	84.9	89.0	93.5
30	El Salvador*	61.8	65.4	72.9	80.3	86.3	92.7	94.4	98.7	102.4	105.9	108.0	109.7	112.1	114.4	116.2	119.3
31	Ethiopia*	60.6	53.5	44.8	57.9	61.1	67.3	79.7	82.8	79.4	84.5	90.6	98.9	100.4	98.2	111.8	123.6
32	Finland	86.7	80.5	76.7	75.8	79.4	83.3	87.0	93.1	98.3	102.2	107.2	109.8	111.5	113.2	117.0	119.9
33	France	88.3	89.3	90.7	89.8	92.0	94.1	95.2	97.5	101.0	104.3	108.2	110.0	111.1	112.1	114.6	116.3
34	Gabon*	60.6	66.7	63.6	67.6	71.3	76.3	79.9	85.6	89.1	80.2	78.3	80.4	80.1	82.6	84.0	87.0
35	Germany	86.9	92.0	94.2	93.4	96.1	98.0	99.0	100.8	102.8	104.8	108.0	109.3	109.3	109.1	110.3	111.2
36	Ghana*	60.6	65.9	69.8	74.6	77.9	82.0	86.6	90.8	95.5	99.9	103.6	107.6	112.1	117.3	122.9	128.8
37	Greece	75.5	78.6	79.3	77.7	79.7	81.8	84.2	87.8	91.2	94.6	99.1	103.5	107.4	112.3	117.0	120.7
38	Guatemala	44.3	48.0	52.8	56.7	60.8	65.7	68.7	73.0	78.0	81.9	85.5	87.8	91.7	94.2	97.4	100.8
39	Haiti*	61.8	66.0	52.9	50.4	42.1	38.2	42.3	45.0	47.2	49.9	50.3	49.3	49.0	49.4	45.8	47.6
40	Honduras	53.3	56.6	62.2	68.4	67.1	71.2	74.8	79.8	82.7	80.8	86.5	89.2	93.0	97.5	103.8	109.8
41	Hong Kong, China	87.0	92.7	98.8	104.8	110.8	113.1	117.3	122.4	116.4	118.9	126.9	127.4	129.2	132.2	140.7	147.8
42	Hungary	73.7	61.8	58.7	58.2	61.1	62.6	63.9	68.5	73.4	77.5	82.7	86.8	91.2	95.4	100.2	104.3
43	Iceland*	86.3	86.1	82.7	84.0	87.6	87.7	92.5	97.4	103.8	107.9	112.2	116.2	116.1	118.8	126.4	133.6
44	India	77.6	78.7	84.1	88.9	95.6	103.1	110.7	114.7	120.9	128.3	132.4	137.6	141.3	149.7	158.0	167.2
45	Indonesia*	66.1	75.0	82.2	89.5	97.0	105.4	113.1	117.8	104.7	105.4	110.4	114.0	118.5	123.3	128.3	134.0
46	Iran, Islamic Rep.*	66.1	78.7	82.9	81.4	81.0	83.7	90.8	94.2	96.9	98.8	104.0	107.6	115.2	122.3	127.4	132.0
47	Ireland	84.2	86.1	89.5	92.2	97.9	107.6	115.8	127.5	136.0	146.7	156.1	162.0	168.0	172.3	176.6	182.1
48	Israel	71.0	78.7	84.3	89.9	96.8	103.5	109.1	111.9	116.0	119.0	127.7	127.1	126.1	127.6	132.4	138.9
49	Italy	79.0	80.5	81.3	80.4	82.6	85.4	86.1	88.0	89.4	91.4	94.9	96.7	97.1	97.1	98.3	98.4
50	Jamaica*	61.8	66.6	68.6	78.0	79.4	81.7	81.6	80.5	80.3	81.0	81.6	83.1	84.6	87.3	88.4	90.2
51	Japan	89.2	92.5	93.5	93.7	94.8	96.8	99.5	101.1	99.0	98.9	101.8	101.9	102.2	103.6	106.4	108.3
52	Jordan*	66.1	67.9	86.6	91.2	96.2	102.4	104.5	107.8	110.8	114.2	118.4	123.7	129.5	133.7	142.2	149.3
53	Kenya*	60.6	62.0	61.2	61.6	64.2	68.6	72.8	73.0	76.4	78.5	79.0	83.5	84.0	87.0	92.0	97.8

[a] Values represent the change (growth or decline) in the size of the formal economy of a country, relative to the previous year.

[b] We include all countries that are covered by our independent variables.

* Countries for which Schneider and Enste (2000) do not provide an estimate. For the base year of these countries, we thus use the average of the estimates provided for their respective region.

Table A (continued). Formal economy index [a]

Country[b]	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
54 Korea, Rep.	70.9	80.2	86.1	92.3	100.8	110.0	117.0	121.6	114.8	124.2	132.7	136.6	143.5	146.6	151.4	155.6
55 Latvia	84.4	71.8	39.7	34.7	36.9	35.9	39.7	48.0	52.7	57.4	64.4	72.4	78.9	86.1	94.7	105.3
56 Lebanon*	66.1	104.3	108.8	115.8	123.8	130.3	135.5	140.0	142.9	141.8	143.3	148.0	151.1	155.2	162.7	163.7
57 Luxembourg*	86.3	94.9	96.8	101.0	104.8	106.2	107.7	113.7	120.2	128.6	137.0	139.5	143.4	144.7	148.4	152.3
58 Malaysia	61.0	70.5	79.4	89.3	98.5	108.4	118.4	125.7	118.3	124.5	133.3	133.6	137.8	143.5	150.3	155.3
59 Malta*	86.3	92.6	97.3	101.8	107.5	113.7	117.7	122.5	126.0	130.0	136.3	134.7	137.3	137.0	137.2	140.4
60 Mexico	62.3	66.5	70.2	72.1	76.6	70.3	75.5	82.3	87.2	91.0	97.6	97.5	98.3	99.7	103.8	106.6
61 Morocco	61.0	67.9	63.9	62.9	73.2	66.6	78.9	76.6	84.3	84.8	86.6	94.2	97.5	103.6	108.8	111.2
62 Mozambique*	60.6	65.5	56.9	63.7	70.7	74.0	81.4	91.6	102.4	110.5	111.6	123.5	132.3	138.3	146.2	154.6
63 Myanmar*	66.1	65.4	75.1	81.1	88.6	95.6	102.0	107.7	113.5	124.5	134.3	145.6	157.6	171.4	174.4	179.4
64 Nepal*	66.1	72.5	76.6	80.4	88.6	92.1	97.4	102.5	105.5	109.9	116.1	120.9	121.0	125.0	129.7	132.8
65 Netherlands	87.2	89.7	91.4	92.6	95.6	98.7	102.1	106.4	110.3	115.0	118.9	120.9	120.9	121.3	123.2	124.8
66 New Zealand	90.9	89.6	90.7	97.2	102.5	106.7	110.2	111.7	112.2	117.4	119.6	123.2	127.7	131.1	134.8	136.8
67 Nicaragua*	61.8	61.6	62.0	61.6	64.9	70.9	77.2	81.2	84.9	91.9	96.0	99.0	99.7	102.2	107.6	111.9
68 Nigeria	24.0	28.8	31.7	33.9	34.0	36.5	40.8	43.5	45.4	46.5	51.9	55.0	56.5	66.8	77.4	82.8
69 Norway	89.1	92.2	95.7	98.5	103.6	107.8	112.9	118.3	120.9	123.0	126.2	128.2	129.7	130.7	134.6	137.3
70 Oman*	66.1	72.2	80.6	86.6	90.5	95.5	98.5	104.6	107.2	107.1	112.5	120.0	122.6	124.6	129.9	135.7
71 Pakistan*	66.1	71.2	78.9	80.6	84.4	89.3	94.2	95.2	97.7	101.4	105.7	107.6	110.9	115.7	123.1	130.7
72 Panama	49.0	58.4	66.6	72.0	74.9	76.6	79.4	85.9	93.2	97.2	99.9	100.4	102.7	106.9	114.4	121.6
73 Paraguay	73.0	75.5	78.9	82.8	86.5	92.0	92.4	95.4	96.0	94.5	91.1	93.2	93.1	97.0	101.1	104.1
74 Peru	49.3	51.5	51.0	55.8	68.6	77.2	79.8	86.6	86.0	86.9	89.8	90.0	95.1	99.1	104.2	110.9
75 Philippines	50.0	49.4	49.8	51.9	56.3	60.9	66.8	72.0	71.4	74.8	80.8	82.5	87.0	91.9	98.3	103.1
76 Poland	77.6	70.6	73.1	76.9	82.1	89.1	95.4	102.5	107.5	112.0	116.2	117.5	119.0	122.8	128.2	131.8
77 Portugal	83.8	88.2	89.3	87.2	88.2	92.5	96.1	100.3	105.0	109.0	112.9	114.9	115.7	114.9	116.3	116.7
78 Romania	80.6	67.6	58.8	60.3	64.3	71.5	75.5	69.4	64.6	63.4	65.5	71.2	76.3	81.5	89.9	94.0
79 Saudi Arabia*	66.1	75.2	79.8	79.9	80.5	80.7	84.1	86.7	89.5	88.8	93.7	94.2	94.3	102.0	107.3	112.8
80 Senegal*	60.6	63.2	64.4	65.7	65.7	71.0	73.1	76.2	82.1	88.4	91.6	96.2	96.9	103.5	109.4	115.1
81 Singapore	87.0	93.6	99.9	111.6	123.2	131.3	139.1	147.5	146.1	153.3	163.4	161.0	165.1	168.2	177.0	183.7
82 Slovak Republic	85.1	70.5	63.8	60.1	66.3	72.1	80.1	85.9	89.6	89.9	90.6	93.8	97.9	102.1	107.5	113.6
83 Slovenia	73.2	64.3	58.8	61.7	67.0	70.6	74.3	79.2	82.8	88.1	92.2	95.3	99.0	101.8	106.2	110.4
84 South Africa	91.0	90.0	87.8	89.1	92.3	95.4	99.7	102.4	102.9	105.3	109.4	112.1	115.8	118.9	123.8	128.9
85 Spain	80.3	82.8	83.8	82.7	85.1	87.9	90.3	94.2	98.6	103.4	108.4	112.1	114.8	117.8	121.1	124.6
86 Sri Lanka	60.0	64.6	69.0	75.9	81.5	87.0	90.8	97.2	101.9	106.2	112.2	110.7	114.6	120.6	126.0	132.3
87 Sudan*	60.6	68.1	74.7	79.3	80.3	86.3	92.2	102.8	107.1	110.2	118.6	124.8	130.2	137.3	142.4	148.7
88 Sweden	87.3	86.2	85.0	83.0	86.9	90.8	92.2	94.5	98.2	102.7	107.0	108.1	110.1	111.8	115.9	118.8
89 Switzerland	91.5	90.7	90.7	90.5	91.5	91.9	92.4	94.3	97.1	98.4	102.0	103.1	103.4	103.2	105.5	107.4
90 Syrian Arab Republic*	66.1	74.0	87.5	92.7	100.3	106.1	110.5	112.3	118.6	115.0	117.8	123.0	126.9	128.6	134.4	138.9
91 Tanzania	69.0	71.1	71.7	72.9	74.4	78.0	82.5	86.1	89.8	93.3	98.4	104.6	111.9	117.6	124.3	131.7
92 Thailand	29.0	37.6	45.6	53.9	62.9	72.1	78.0	76.6	66.1	70.6	75.3	77.5	82.8	90.0	96.3	100.8
93 Togo*	60.6	59.9	55.9	40.8	55.8	63.7	72.5	86.9	84.6	87.0	86.3	86.1	90.2	92.9	95.9	97.2
94 Trinidad and Tobago*	61.8	64.5	62.8	61.4	64.9	68.9	72.8	75.6	83.3	87.7	93.8	97.9	106.0	120.4	129.2	137.1
95 Tunisia	55.0	58.9	66.7	68.9	72.1	74.4	81.6	87.0	91.8	97.9	102.6	107.5	109.1	114.7	120.7	124.7
96 Turkey*	66.1	66.8	71.9	79.5	74.8	82.7	90.1	97.7	100.0	96.6	103.4	97.7	103.9	109.1	118.5	126.9
97 United Arab Emirates*	66.1	66.3	69.0	68.1	75.4	83.4	89.5	96.2	100.5	104.4	109.3	117.3	119.9	131.8	141.5	150.0
98 United Kingdom	88.8	87.4	87.7	89.9	94.2	97.2	99.9	103.0	106.3	109.3	113.1	115.5	117.5	120.2	123.5	125.4
99 United States	90.0	89.8	93.1	95.8	99.8	102.4	106.1	110.7	114.9	119.4	123.1	123.8	125.4	128.0	131.9	135.1
100 Uruguay	64.8	68.3	76.3	78.9	86.2	84.8	90.3	95.4	99.9	97.1	95.6	92.3	81.2	83.4	95.2	101.8
101 Venezuela, RB	69.6	79.3	85.4	85.7	83.3	87.3	87.1	93.4	93.7	87.8	91.5	94.8	86.0	78.2	96.5	106.8
102 Vietnam*	66.1	72.1	80.7	88.8	97.6	107.2	116.5	124.7	130.4	135.2	142.0	148.9	156.0	163.3	171.1	179.5
103 Yemen, Rep.*	66.1	68.1	76.4	80.5	82.6	94.3	100.3	108.3	114.7	117.5	121.9	126.5	130.4	133.5	137.4	143.0
104 Zambia*	60.6	60.6	58.8	65.6	57.0	54.2	61.1	64.4	62.6	64.8	68.4	73.3	76.0	81.6	87.1	92.3
105 Zimbabwe*	60.6	66.1	57.1	58.2	67.4	67.6	77.9	80.6	83.5	79.9	72.0	69.3	64.9	54.5	50.7	45.4

[a] Values represent the change (growth or decline) in the size of the informal economy of a country, relative to the previous year. Values may therefore be negative.

[b] We include all countries that are covered by our independent variables.

* Countries for which Schneider and Enste (2000) do not provide an estimate. For the base year of these countries, we thus use the average of the estimates provided for their respective region.

Table B. Informal economy index [a]

	Country[b]	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
1	Albania*	17.6	20.9	38.4	46.1	48.1	48.8	103.6	88.0	67.3	111.1	107.3	97.3	120.8	105.3	91.5	84.6
2	Algeria*	39.4	43.3	49.1	51.3	54.8	54.6	54.4	55.3	59.2	63.5	67.4	69.9	69.6	71.7	70.1	77.3
3	Angola*	39.4	46.5	54.9	80.0	77.1	67.1	63.1	95.3	97.7	95.8	100.9	111.2	104.4	114.3	115.5	113.2
4	Argentina	21.8	13.9	8.1	9.7	7.2	19.3	23.0	24.0	21.6	31.8	36.5	43.5	50.4	51.0	48.3	45.2
5	Australia	13.7	15.8	17.5	16.6	14.8	13.6	12.1	11.5	13.5	11.2	9.7	12.2	13.6	11.1	12.6	14.1
6	Austria	10.6	12.0	8.8	8.4	7.1	7.9	8.1	10.1	8.5	5.1	4.8	7.4	8.5	11.4	11.2	10.9
7	Bahrain*	33.9	20.3	30.6	27.0	35.7	35.5	36.9	37.0	39.5	39.9	37.8	41.2	44.6	48.2	50.1	45.3
8	Bangladesh*	33.9	34.2	51.7	60.8	64.8	72.3	74.7	73.7	76.7	83.5	87.3	94.2	98.6	100.4	105.5	106.5
9	Belgium	19.1	22.0	23.8	25.6	27.0	27.7	29.1	24.9	30.7	26.4	26.8	26.5	26.0	26.7	26.1	24.8
10	Benin*	39.4	43.3	48.8	49.6	49.4	54.6	66.9	54.2	82.7	73.6	83.1	87.2	97.2	90.8	99.9	105.1
11	Bolivia	65.6	68.0	71.9	77.7	81.8	84.9	88.0	90.1	91.5	96.3	95.2	93.5	95.4	94.7	95.7	103.4
12	Botswana	27.0	33.8	42.4	42.8	46.2	41.3	50.3	36.1	39.9	32.7	16.6	38.4	37.7	36.6	41.3	41.0
13	Brazil	33.4	36.0	38.6	38.6	36.8	38.5	42.7	43.6	48.4	50.7	50.9	43.3	45.6	49.7	49.2	50.6
14	Bulgaria	25.1	24.2	16.2	18.9	17.2	23.9	33.2	31.5	29.9	16.0	11.7	10.6	3.8	1.8	-6.2	-8.4
15	Cameroon*	39.4	42.7	47.0	54.3	46.8	41.9	43.2	46.8	42.7	43.9	41.1	33.4	25.8	32.4	47.0	49.8
16	Canada	11.9	15.3	15.5	15.3	12.0	11.1	11.7	9.6	3.3	0.3	-1.8	-3.7	-4.8	-4.2	-6.2	-7.9
17	Chile	27.6	27.6	28.0	26.7	27.5	28.4	33.0	35.9	38.6	50.7	51.8	54.8	57.6	61.0	63.2	58.4
18	China*	33.9	33.6	30.9	27.7	25.6	21.8	19.5	15.1	10.3	8.7	9.8	10.0	12.4	19.5	25.1	27.8
19	Colombia	30.1	29.7	15.8	27.7	28.2	25.9	30.3	26.6	24.3	24.9	25.6	25.7	26.9	25.4	26.3	22.6
20	Congo, Dem. Rep.*	39.4	47.3	53.3	59.3	65.6	75.9	75.9	75.1	75.8	85.6	95.6	95.7	95.7	95.5	95.2	92.7
21	Congo, Rep.*	39.4	46.3	42.3	36.3	34.3	38.2	24.6	48.3	30.2	-13.4	59.1	64.5	76.6	69.3	76.9	82.3
22	Costa Rica	28.6	33.4	29.8	30.1	32.9	32.1	29.0	37.5	26.0	31.7	36.9	39.6	39.3	42.4	40.1	39.1
23	Croatia	22.8	29.6	24.5	32.4	27.2	24.7	27.3	15.4	13.7	26.7	24.8	22.1	23.5	20.3	21.5	22.0
24	Cyprus	21.0	24.6	32.1	39.7	37.8	24.8	26.2	27.7	32.8	32.5	35.6	35.9	42.9	48.6	46.8	48.5
25	Czech Republic	14.7	19.9	17.2	16.3	17.2	16.7	17.6	15.6	17.4	13.0	12.9	13.3	11.3	10.7	8.7	4.4
26	Denmark	14.3	17.9	16.5	18.1	15.4	12.0	13.5	8.6	11.6	4.8	1.2	1.0	1.5	2.5	0.8	-1.3
27	Dominican Republic*	38.2	41.8	72.1	65.1	66.2	57.6	80.1	74.2	74.4	65.8	70.0	74.9	84.7	104.6	105.2	96.8
28	Ecuador	31.2	34.4	37.9	38.9	42.9	43.8	54.6	59.8	65.0	65.4	64.5	62.9	59.0	59.3	53.8	52.4
29	Egypt, Arab Rep.	68.0	71.7	70.0	71.6	71.4	71.4	76.4	77.9	81.1	83.5	83.8	87.6	91.3	96.5	98.0	96.3
30	El Salvador*	38.2	41.2	39.2	46.7	50.0	52.7	55.9	57.1	70.8	61.4	73.4	63.4	67.6	69.8	71.0	72.2
31	Ethiopia*	39.4	47.1	58.4	56.7	58.5	57.5	50.1	47.7	53.6	47.9	43.6	55.5	55.6	70.1	67.1	68.3
32	Finland	13.3	20.0	24.6	30.0	31.4	27.8	29.4	27.0	25.1	20.7	17.3	17.5	18.9	19.3	18.0	11.4
33	France	11.7	17.8	18.8	19.8	19.1	18.7	22.5	19.5	19.0	18.1	16.1	16.5	15.6	18.4	18.3	17.3
34	Gabon*	39.4	34.7	38.1	34.7	21.7	20.1	29.3	27.1	33.5	43.2	44.9	47.9	53.6	54.4	55.2	54.2
35	Germany	13.1	7.6	4.3	3.3	0.3	0.0	0.6	-0.7	-1.5	-3.9	-3.9	-2.4	-3.8	-1.2	-0.6	-0.4
36	Ghana*	39.4	40.3	43.8	43.1	35.4	45.2	58.0	27.4	4.9	13.1	39.2	48.2	32.2	13.5	9.8	15.8
37	Greece	24.5	23.6	28.2	32.2	34.7	36.2	38.5	37.3	38.8	40.8	43.0	42.0	42.5	41.6	39.3	37.7
38	Guatemala	55.7	57.7	65.7	70.2	73.9	75.9	77.1	79.8	86.5	94.8	84.2	92.7	92.7	123.5	127.3	128.8
39	Haiti*	38.2	12.0	16.5	-8.9	-33.9	34.8	44.8	68.7	55.9	61.1	53.7	54.7	43.4	38.6	42.1	74.3
40	Honduras	46.7	41.8	32.3	33.1	26.0	41.5	57.8	52.0	67.2	60.5	78.8	81.1	85.8	85.9	87.3	84.9
41	Hong Kong, China	13.0	13.5	10.7	10.7	10.0	10.0	12.1	8.3	28.8	20.8	17.2	19.3	19.7	17.7	11.2	6.2
42	Hungary	26.3	32.3	32.0	28.6	26.5	26.2	30.8	20.8	23.1	18.9	13.1	12.3	11.1	9.2	5.4	3.5
43	Iceland*	13.7	13.7	19.4	23.1	22.4	24.8	20.3	25.6	32.8	45.1	49.1	49.4	54.0	51.1	46.3	40.0
44	India	22.4	30.5	31.5	34.2	36.0	35.5	30.0	32.3	30.9	26.6	25.1	21.7	22.9	20.5	18.9	16.2
45	Indonesia*	33.9	37.1	41.6	45.2	50.9	57.5	64.3	73.3	87.6	95.7	101.5	104.7	103.1	102.4	109.5	109.9
46	Iran, Islamic Rep.*	33.9	29.5	34.4	41.8	47.7	48.8	50.9	52.7	55.2	61.5	63.2	66.6	66.6	68.4	70.7	73.1
47	Ireland	15.8	17.9	20.6	20.4	19.0	13.9	12.4	6.1	3.5	-2.4	-3.6	-6.1	-8.1	-9.8	-10.9	-13.2
48	Israel	29.0	22.5	33.4	33.7	36.0	36.5	37.9	40.4	44.7	47.1	47.9	51.0	55.6	57.7	56.3	52.4
49	Italy	21.0	21.5	22.8	23.6	24.6	25.3	26.6	27.7	29.3	29.6	30.4	30.7	33.0	35.4	35.5	36.6
50	Jamaica*	38.2	16.2	118.9	115.9	126.8	146.6	150.3	155.0	159.9	161.2	161.5	161.4	163.5	164.2	162.5	161.9
51	Japan	10.9	11.0	10.7	11.7	17.1	17.8	17.4	18.2	20.8	22.7	22.0	20.2	21.4	18.9	19.2	19.3
52	Jordan*	33.9	33.8	32.3	35.8	38.9	42.4	47.7	47.3	51.8	52.5	53.2	52.3	54.6	55.5	56.4	55.1
53	Kenya*	39.4	42.5	46.5	51.5	60.2	59.7	60.2	60.7	61.1	53.8	45.6	52.9	59.7	63.8	64.9	64.4

[a] Values represent the change (growth or decline) in the size of the informal economy of a country, relative to the previous year. Values may therefore be negative.

[b] We include all countries that are covered by our independent variables.

* Countries for which Schneider and Enste (2000) do not provide an estimate. For the base year of these countries, we thus use the average of the estimates provided for their respective region. As we discuss in the robustness test section, we run analyses with this measure both with and without these countries.

Table B (continued). Informal economy index [a]

	Country[b]	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
54	Korea, Rep.	29.2	29.9	34.4	38.7	44.4	47.4	51.7	56.8	59.7	61.0	61.3	64.6	77.6	79.5	81.2	82.7
55	Latvia	15.6	24.5	35.8	16.9	9.4	10.2	-27.5	-11.1	50.7	18.7	11.3	8.2	4.8	4.6	-0.6	-5.9
56	Lebanon*	33.9	95.7	111.6	122.2	124.0	125.0	162.0	178.4	172.9	171.0	172.8	170.0	175.1	174.5	165.8	166.4
57	Luxembourg*	13.7	9.5	0.7	-4.5	2.2	10.7	13.8	12.1	2.4	-5.8	-9.5	-12.6	-13.5	-11.2	-10.9	-17.0
58	Malaysia	39.0	41.9	47.9	49.0	57.7	63.0	64.2	73.5	89.5	85.1	83.5	91.6	90.4	89.8	88.3	89.5
59	Malta*	13.7	38.3	38.3	34.5	30.2	29.7	23.1	20.0	19.6	23.3	20.4	22.3	25.3	34.6	33.5	33.3
60	Mexico	37.7	36.5	35.4	39.6	43.1	52.8	55.2	56.8	50.6	51.6	52.9	54.8	56.6	55.2	53.3	54.8
61	Morocco	39.0	37.4	51.6	54.4	50.5	61.0	50.8	63.5	65.8	52.0	61.5	59.6	61.2	62.9	64.7	71.3
62	Mozambique*	39.4	70.1	79.2	69.9	53.8	58.5	65.7	23.5	11.1	120.9	206.1	321.4	311.2	350.3	365.9	361.0
63	Myanmar*	33.9	28.5	28.3	38.2	38.5	38.7	34.3	42.0	38.1	33.4	35.3	15.9	18.4	14.9	13.5	3.0
64	Nepal*	33.9	36.1	34.2	37.1	39.1	44.6	53.0	47.6	50.4	59.9	62.7	69.4	75.6	77.6	76.5	76.2
65	Netherlands	12.8	13.2	14.4	14.9	15.2	14.6	17.1	13.2	24.8	12.7	12.0	12.4	13.6	14.4	15.4	15.1
66	New Zealand	9.1	13.4	9.8	9.6	6.6	2.6	2.5	2.2	4.9	3.2	1.1	-3.9	-5.1	-5.0	-0.4	-2.6
67	Nicaragua*	38.2	40.3	41.8	40.6	34.4	35.7	48.0	37.9	47.5	41.2	41.3	39.8	47.3	45.6	52.3	54.0
68	Nigeria	76.0	76.8	76.9	89.6	86.6	82.3	74.2	69.4	63.8	63.6	59.0	59.9	99.3	89.3	102.8	105.1
69	Norway	10.9	10.2	7.2	5.7	2.4	-0.1	-11.0	-10.6	-8.6	-10.3	-13.2	-12.3	-17.1	-23.3	-22.2	-20.3
70	Oman*	33.9	30.8	32.2	40.5	42.2	41.6	42.3	43.3	50.6	54.5	54.5	55.6	57.3	58.4	63.4	54.6
71	Pakistan*	33.9	39.1	46.7	47.9	50.0	51.3	49.4	51.9	46.5	48.8	51.5	53.3	54.0	57.9	57.3	59.6
72	Panama	51.1	49.3	47.0	48.9	53.9	59.3	64.6	61.4	55.9	61.4	64.7	66.6	68.6	70.9	70.0	66.9
73	Paraguay	27.0	31.2	37.0	48.0	58.9	67.9	71.2	75.3	77.7	83.6	92.3	90.6	93.8	86.6	82.8	85.8
74	Peru	50.7	56.7	41.0	48.2	39.4	35.0	42.1	39.9	48.0	50.5	52.9	57.8	59.1	59.6	60.8	59.6
75	Philippines	50.0	52.5	49.2	52.1	60.2	63.7	67.7	71.2	69.7	74.5	79.2	83.6	81.9	85.4	84.8	82.0
76	Poland	22.5	24.2	17.7	14.8	10.3	5.7	3.2	-3.4	-8.6	-13.3	-16.0	-17.2	-20.3	-20.6	-23.2	-26.3
77	Portugal	16.2	16.9	20.9	22.6	24.4	27.6	32.3	25.4	30.4	35.2	37.1	39.1	42.6	46.1	48.7	51.7
78	Romania	19.5	17.8	17.8	14.1	8.4	5.2	2.5	3.4	2.4	-5.4	-4.9	-8.1	-14.4	-12.7	-19.2	-20.4
79	Saudi Arabia*	33.9	30.8	36.1	47.0	50.8	54.9	54.4	57.1	63.0	68.5	66.9	74.1	78.6	81.6	78.7	78.5
80	Senegal*	39.4	38.9	47.3	44.4	52.8	49.5	50.7	57.0	57.5	50.3	35.9	55.7	76.2	58.3	65.3	76.8
81	Singapore	13.0	12.6	13.9	9.9	7.9	6.8	7.4	10.9	17.8	15.0	11.8	16.1	16.1	16.1	11.0	9.2
82	Slovak Republic	15.0	21.9	20.5	21.8	16.3	18.3	18.5	-0.3	-5.0	5.0	2.6	0.7	-3.0	-7.8	-11.7	-21.0
83	Slovenia	26.8	31.8	35.3	32.5	33.0	30.7	27.8	25.9	23.8	20.5	20.4	21.4	24.1	24.5	23.9	21.2
84	South Africa	9.0	11.0	11.1	13.1	13.9	15.4	15.4	17.8	17.8	14.2	13.1	11.2	12.7	15.4	14.4	9.7
85	Spain	19.7	19.4	21.3	21.4	22.8	24.8	23.7	32.4	31.1	32.6	35.3	37.3	38.9	39.5	41.9	43.8
86	Sri Lanka	40.0	40.8	42.9	47.1	51.9	55.3	47.0	53.6	57.9	59.7	67.4	66.5	68.7	74.5	76.5	77.3
87	Sudan*	39.4	30.5	26.4	19.9	24.7	19.9	17.8	3.4	-1.2	47.3	39.9	38.2	45.8	54.3	64.9	64.8
88	Sweden	12.7	15.1	14.4	16.8	12.2	10.0	4.4	3.1	5.2	-1.3	-4.1	-2.7	-6.3	-9.9	-13.2	-15.6
89	Switzerland	8.5	11.9	11.6	10.2	9.6	11.5	7.1	15.2	5.6	12.4	10.4	12.4	12.4	15.8	14.3	14.2
90	Syrian Arab Republic*	33.9	30.7	20.4	15.9	20.7	28.8	34.8	38.3	39.7	51.8	56.8	61.3	67.2	72.5	75.3	79.7
91	Tanzania	31.0	38.5	38.8	39.1	35.6	51.0	58.3	48.7	54.7	46.0	47.1	47.2	46.7	31.4	23.8	33.4
92	Thailand	71.0	75.4	81.2	86.9	88.6	93.3	95.9	104.9	112.7	108.6	111.6	114.3	117.4	117.0	118.0	119.0
93	Togo*	39.4	35.7	53.1	44.0	43.2	67.7	91.9	36.6	93.0	95.0	81.8	89.8	82.4	93.2	96.7	95.8
94	Trinidad and Tobago*	38.2	34.9	44.7	45.5	45.1	48.9	50.1	59.5	55.3	52.4	51.2	50.2	42.2	45.2	35.4	37.4
95	Tunisia	45.0	45.2	45.1	48.2	54.6	55.3	51.0	52.1	53.9	58.4	59.5	61.5	63.7	62.6	61.1	61.3
96	Turkey*	33.9	38.8	43.7	44.6	53.6	54.6	60.3	60.8	63.7	72.1	73.1	77.9	76.7	79.2	78.1	77.6
97	United Arab Emirates*	33.9	35.3	40.3	57.5	59.4	56.6	56.7	59.9	74.8	85.6	87.1	83.0	89.3	83.2	79.5	85.9
98	United Kingdom	11.2	14.7	14.7	13.4	7.3	8.3	10.1	6.5	6.4	4.9	3.2	1.7	0.1	-1.6	-4.7	-4.5
99	United States	10.1	15.2	12.3	13.0	11.8	12.1	11.0	7.9	7.2	4.7	5.1	0.7	2.0	0.4	-2.0	-2.0
100	Uruguay	35.2	40.5	34.9	39.5	35.2	43.5	41.6	40.3	56.0	55.2	60.3	62.9	70.1	65.0	58.7	55.4
101	Venezuela, RB	30.4	26.0	27.8	30.1	33.4	31.1	34.2	30.9	32.8	36.7	37.5	38.5	46.7	56.7	43.8	38.5
102	Vietnam*	33.9	33.9	30.5	34.6	43.3	54.2	64.1	70.4	80.9	86.2	93.8	102.0	111.7	120.1	127.9	135.0
103	Yemen, Rep.*	33.9	43.4	41.1	44.1	36.0	33.4	27.3	34.1	28.2	27.1	32.8	34.2	38.8	45.7	49.5	53.0
104	Zambia*	39.4	38.7	42.7	39.0	48.9	51.3	43.4	35.8	31.5	32.6	33.8	35.2	39.3	39.5	40.3	39.3
105	Zimbabwe*	39.4	35.2	38.0	32.3	30.1	37.2	42.6	44.9	35.3	41.8	47.1	47.2	52.6	63.4	64.8	91.7

[a] Values represent the change (growth or decline) in the size of the informal economy of a country, relative to the previous year. Values may therefore be negative.

[b] We include all countries that are covered by our independent variables.

* Countries for which Schneider and Enste (2000) do not provide an estimate. For the base year of these countries, we thus use the average of the estimates provided for their respective region. As we discuss in the robustness test section, we run analyses with this measure both with and without these countries.

Table C. Informal entrepreneurship index (IEI) [a]

	Country	Estimate 1			Estimate 2		
		2003	2004	2005	2003	2004	2005
1	Argentina	33.5	26.8	28.0	37.0	31.4	31.2
2	Australia	22.5	25.5	.	23.3	26.4	.
3	Austria	.	.	24.3	.	.	25.4
4	Belgium	39.4	21.4	22.5	40.9	23.0	23.9
5	Canada	35.1	31.5	33.4	34.9	31.1	33.0
6	Chile	29.7	.	22.3	35.5	.	28.0
7	Croatia	27.3	38.6	33.7	28.7	40.0	35.3
8	Denmark	17.4	13.5	11.2	17.8	13.8	11.4
9	Finland	.	15.9	16.3	.	16.8	16.9
10	France	25.1	52.8	49.1	26.7	54.5	50.7
11	Germany	20.1	21.1	18.2	20.2	21.3	18.4
12	Greece	.	23.2	23.1	.	24.8	24.8
13	Hungary	.	29.9	18.0	.	30.7	18.5
14	Iceland	26.3	24.4	34.1	30.3	27.8	37.3
15	Ireland	25.2	20.5	20.7	24.9	20.1	20.2
16	Israel	.	37.0	.	.	38.2	.
17	Italy	31.3	21.6	19.5	32.8	23.1	21.2
18	Japan	.	3.5	9.5	.	4.3	10.3
19	Jordan	.	18.5	.	.	20.5	.
20	Latvia	.	.	29.8	.	.	29.3
21	Netherlands	14.1	16.1	13.6	15.2	17.3	14.9
22	New Zealand	17.6	14.3	15.0	16.9	14.2	14.6
23	Norway	15.2	15.2	10.2	11.9	12.1	7.1
24	Peru	.	51.6	.	.	53.5	.
25	Poland	.	18.1	.	.	16.8	.
26	Singapore	29.1	13.2	12.5	30.4	14.3	13.5
27	Slovenia	23.3	19.1	19.3	24.9	20.7	20.7
28	South Africa	45.2	50.8	47.5	45.8	51.4	48.1
29	Spain	31.3	9.4	11.2	33.1	11.3	13.0
30	Sweden	16.0	10.5	9.2	15.3	9.5	7.9
31	Switzerland	19.9	.	10.1	21.3	.	11.0
32	United Kingdom	8.4	8.2	13.9	8.5	7.7	13.5
33	United States	34.1	31.4	38.0	34.2	31.2	37.8

[a] Note that panel GLS models require at least two years of data for a country to be included in the analysis. Therefore, only the 27 countries (and their 74 observations) that meet this criteria are included in the GLS models presented in the paper.