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# Informal Entrepreneurship in Developing Economies: The Impacts of Starting Up Unregistered on Firm Performance

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**To advance understanding of the entrepreneurship process in developing economies, this article evaluates whether registered enterprises that initially avoid the cost of registration, and focus their resources on overcoming other liabilities of newness, lay a stronger foundation for subsequent growth. Analyzing World Bank Enterprise Survey data across 127 countries, and controlling for other firm performance determinants, registered enterprises that started up unregistered and spent longer operating unregistered are revealed to have significantly higher subsequent annual sales, employment, and productivity growth rates compared with those that registered from the outset. The theoretical and policy implications are then discussed.**

## Introduction

In recent years, a small but burgeoning body of entrepreneurship scholarship has begun to focus upon entrepreneurship in the informal sector, by which is here meant starting up and/or owning and managing a business venture which does not register with and/or declare some or all of its production and/or sales to the authorities for tax, benefit, and/or labor law purposes when it should do so (Ketchen, Ireland, & Webb, 2014; Siqueira, Webb, & Bruton, 2016; Williams & Martinez-Perez, 2014). This is an important development in entrepreneurship scholarship. With two-thirds of enterprises in the

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developing world estimated to start up unregistered (Autio & Fu, 2015), advancing comprehension of the reasons for, and impacts of, nonregistration is crucial if the entrepreneurship process in developing economies is to be more fully understood.

Conventionally, nonregistration has been viewed as deleterious to firm performance. In the long-standing liabilities of newness approach, registration provides new ventures with some level of legitimacy, and reduces their probability of failure (Stinchcombe, 1965). Here, however, we question the transferability of this widely accepted (developed world) view of the reasons for, and impacts of, registration to the developing world. The aim of this article is to analyze whether formal enterprises in developing countries that initially avoid the cost of registration, and instead concentrate their scarce resources on overcoming other liabilities of newness, subsequently outperform those which registered from the outset.

By analyzing the relationship between starting up unregistered and future firm performance, knowledge is advanced in three important ways. First, this article advances theory on not only venture creation and growth in developing countries but also develops a more contextualized understanding of liabilities of newness. Reading venture creation and liabilities of newness in the impoverished setting of the developing world through the lens of institutional theory, it will be asserted not only that unregistered enterprises may lack formal legality but possess a level of social legitimacy (Godfrey, 2015; Webb, Tihanyi, Ireland, & Sirmon, 2009) but also that the considerable formal market imperfections in the developing world result in registration having limited benefits but relatively substantial costs. Hence, rather than address their liabilities of newness by investing resources in seeking legality through registration, which in many developing economies is a significant cost but with few benefits, enterprises in the developing world that delay registration and its associated costs, and instead focus their scarce resources on overcoming other liabilities of newness (e.g., establishing stronger routines, relationships with suppliers and customers), are propounded to lay the foundations for stronger subsequent firm performance than those that register from the outset. The original empirical contribution of this article, using World Bank Enterprise Survey (WBES) data on 127 developing countries, is to reveal that registered enterprises that start up unregistered and spend longer operating unregistered do indeed outperform those registering from the outset. This is the case for econometric estimations using imputed and nonimputed data, with and without outlying observations, and with correction for potential sample selection bias, given that registration at start up is an endogenous choice. Finally, and from a policy perspective, we demonstrate the need for governments in developing countries when tackling informal entrepreneurship to put less emphasis on pursuing a punitive approach that does not deal with the causes of nonregistration, and to place more emphasis on the institutional conditions that significantly disadvantage enterprises registering from the outset relative to those delaying registration, due to the costs of registration outweighing the benefits.

To advance understanding of the entrepreneurship process in developing countries, therefore, the first section frames the contributions of this article by reviewing how institutional theory explains nonregistration in developing countries. This will reveal that despite institutional scholars recognizing that unregistered enterprises often possess social legitimacy in the developing world, and that they prevail due to formal institutional imperfections and institutional incongruence, little attention has been given to evaluating the impacts of starting up unregistered on subsequent firm performance. Consequently, to develop theory and hypotheses, the second section reviews the conventional (developed world) liabilities of newness approach that views registration as providing some level of legality and as positively affecting firm performance, followed by the need for a

rethinking of nonregistration in developing world contexts along with the rationales for viewing enterprises in developing countries that initially avoid the cost of firm registration as achieving higher subsequent firm performance than those that register from the outset. To evaluate the resultant propositions, the third section introduces the data and methods, namely World Bank Enterprise Survey (WBES) harmonized data on 95,522 enterprises in 127 developing countries and multilevel modeling techniques (random constant and random slope models). In the fourth section, we present the results to explore the main impacts of starting up unregistered and the duration of nonregistration. To control for sample selection bias, we use a Heckman two-step estimator, while robustness checks on the results are conducted by removing outliers from both ends of the distribution of suspected variables. Finding that registered enterprises that started up unregistered and spent longer unregistered have significantly higher subsequent annual sales, employment and productivity growth rates than enterprises registered from the outset, the fifth and final section discusses the resultant theoretical and policy advances along with the limitations of the research and future research required.

## Informal Entrepreneurship in Developing Countries: An Institutional Perspective

For much of the twentieth century, the informal sector in developing countries was largely deemed unimportant and unworthy of scholarly attention. A modernization theory prevailed that depicted the informal sector as some minor and declining remnant of an earlier mode of production, and its continuing persistence in countries as signaling their "underdevelopment" and "backwardness" (Geertz, 1963; Gilbert, 1998; Lewis, 1959). The widespread belief was that such endeavor would naturally and inevitably disappear with economic advancement and modernization. Over the past few decades however, the informal sector has been recognized as an extensive and persistent feature of the developing world, equivalent to some 40–60% of GDP (Schneider & Williams, 2013), with 60% of the workforce having their main employment in the informal economy (Jütting & Laiglesia, 2009), of which 70% are self-employed (ILO, 2013). Indeed, although there is a lack of robust comprehensive data on the number of unregistered businesses, a conservative lower-bound estimate is that at least half of all enterprises are unregistered (Acs, Desai, Stenholm, & Wuebker, 2013), and that some two-thirds of all enterprises are unregistered at start up (Autio & Fu, 2015).

Recently, significant advances have been made in understanding the prevalence of informal entrepreneurship in developing countries by scholars adopting an institutional perspective. Entrepreneurship is viewed as a socially constructed behavior (Sine & David, 2010; Webb & Ireland, 2015), and institutions as "the rules of the game" which prescribe, monitor, enforce, and support what is socially acceptable (Baumol & Blinder, 2008; Denzau & North 1994; Mathias, Lux, Crook, Autry, & Zaretzki, 2014; North, 1990; Webb et al., 2009). All societies have both formal institutions (i.e., codified laws and regulations) that set out the legal rules of the game, as well as informal institutions which are the "socially shared rules, usually unwritten, that are created, communicated and enforced outside of officially sanctioned channels" (Helmke & Levitsky, 2004, p. 727). Informal entrepreneurship is viewed as an endeavor occurring outside of formal institutional prescriptions but within the norms, values, and beliefs of informal institutions (Godfrey, 2011; Kistruck, Webb, Sutter, & Bailey, 2015; Siqueira et al., 2016; Webb et al.; Welter, Smallbone, & Pobol, 2015). For example, although avoiding registration laws is formally illegal, in many developing economies registration requirements are seen as overly

burdensome, due to the formal institutional imperfections, and their circumvention thus deemed socially legitimate (De Soto, 1989; Webb, Bruton, Tihanyi, & Ireland, 2013).

This institutional perspective, therefore, has explained informal entrepreneurship in developing countries as resulting from either formal institutional imperfections and/or the incongruence between formal and informal institutions. As Webb and Ireland (2015) outline, these formal institutional imperfections are of four types. First, there are formal institutional voids, including the lack of, or poorly defined, property rights, lack of basic utilities, and poor social protection which forces citizens into necessity-driven informal entrepreneurship as a survival strategy (Kistruck, Webb, Sutter, & Ireland, 2011; Webb, Kistruck, Ireland, & Ketchen, 2010). Second, there are formal institutional inefficiencies, or resource misallocations by formal institutions (Qian & Strahan, 2007), such as when formal institutions seek to protect or maximize economic rents for elites (Acemoglu & Robinson, 2012), manifested in overly burdensome taxes, and registration and licensing regulations and costs, which act as an entry barrier to formality for new entrepreneurs (De Soto, 1989; Siqueira et al., 2016; Williams, Shahid, & Martinez, 2016). Third, there is formal institutional uncertainty when technology and sociocultural changes outpace changes in the ability of formal institutions to accommodate new domains of activity and fourth, there is formal institutional weakness and instability, manifested in a lack of capacity to enforce policies (Webb et al., 2009) and continuous changes in laws and regulations (Levitsky & Murillo, 2009; Williams & Vorley, 2015).

When explaining informal entrepreneurship, however, focusing upon solely formal institutional imperfections ignores the role played by cognitive and normative institutions, which can be joined within the broad category of informal institutions (Godfrey, 2015; North, 1990; Scott, 2008). Indeed, informal entrepreneurship has been increasingly viewed as arising "because of the incongruence between what is defined as legitimate by formal and informal institutions" (Webb et al., 2009, p. 495). Given that developing economies are so defined precisely because they have under-developed formal institutions, entrepreneurs draw upon existing norms, values, and beliefs to facilitate, govern, and structure their economic activities instead of relying on formal codified laws and regulations (London, Esper, Grogan-Kaylor, & Kistruck, 2014; Mair, Marti, & Ventresca, 2012). When these formal and informal institutions do not align, as is common in many developing countries, the result is informal entrepreneurship which, although formally illegal, is deemed socially legitimate (De Castro, Khavul, & Bruton, 2014; Kistruck et al., 2015; Siqueira et al., 2016; Webb et al., 2013; Webb, Ireland, & Ketchen, 2014). Indeed, the greater the degree of incongruence (i.e., nonalignment) between formal and informal institutions, the higher the level of informal entrepreneurship (Williams & Shahid, 2016). Informal entrepreneurship is therefore more extensive in developing than developed economies due to not only the greater formal institutional imperfections, but also the greater incongruence between formal and informal institutions, resulting in the use of informal institutions as an alternative guiding framework (Mair et al., 2012; Godfrey, 2015).

Turning to the impacts of entrepreneurs deciding to operate informally, the widespread finding has been that enterprises operating under the guiding framework of the informal institutional environment are less efficient and poorer performing than those operating in formal institutional environments (Benjamin & Mbaye, 2012; La Porta & Schleifer, 2008, 2014). Indeed, not only do new ventures operating legitimately show higher levels of revenue and profits, use more workers, and are more capital intensive than their informal counterparts (Fajnzylber, Maloney, & Montes-Rojas, 2011; McKenzie & Sakho, 2010) but there is also evidence that registration by informal firms leads to higher firm performance than if they remained unregistered (Demenet, Razafindrakoto, & Roubaud, 2015; Fajnzylber et al.; Rand & Torm, 2012). What has been seldom evaluated,

however, is whether enterprises that start up unregistered and register later, not least to avoid the cost of registration during their start up phase, subsequently witness higher firm performance than those registered from the outset. This empirical focus, as will now be shown, is important because it enables new theoretical insights to be generated regarding the longstanding liabilities of newness approach.

## Starting Up Unregistered and Firm Performance

### Impacts of Delaying Registration on Future Firm Performance

The concept of liabilities of newness (Stinchcombe, 1965) has been a key element in scholars' understanding of the emergence and growth of new ventures for the past half century. Recognizing that new ventures have higher mortality rates than older more established ventures (Barron, West, & Hannan, 1994; Wiklund, Baker, & Shepherd, 2010), new ventures are asserted to lack a track record of past performance on which to base claims of legitimacy, reliability, and accountability (Choi & Shepherd, 2005; Delmar & Shane, 2004) and to be perceived as competent, effective, and worthy (Zimmerman & Zeitz, 2002). Registering is, thus, a way of enhancing legitimacy because registering suggests that a business complies with other laws and regulations, such as paying taxes and has the appropriate licenses and certifications, and thereby generally contributes to the overall societal good (Kistruck et al., 2015; Webb et al., 2009), signaling stability, quality, and/or prestige (Bitektine, 2011; Suchman, 1995) and reducing liabilities of newness. Nonregistration, conversely, is seen to lead to a lack of legitimacy which negatively affects nascent firm performance (Fajnzylber, Maloney, & Montes Rojas, 2009; Farrell, 2004; ILO, 2007; La Porta & Schleifer, 2008; Palmer, 2007).

Ventures starting up unregistered should therefore have worse subsequent performance levels than those registered from the outset, all other things being equal. However, although a positive relationship has been identified between newness and mortality rates (Dobrev & Gotsopoulos, 2010; Le Mens, Hannan, & Pólos, 2011), with the exception of Henderson (1999) who examines sales growth, the impact of newness has not been evaluated using other firm performance measures, and neither has there been any evaluation of whether formal enterprises delaying registration suffer worse future firm performance than those registered from the outset. Although studies by McKenzie and Sakho (2010) in Bolivia and McCulloch, Schulze, and Voss (2010) in rural Indonesia evaluate the benefits of registration, they do not consider the benefits of nonregistration. Neither has there been any comparison of the firm performance of registered firms delaying registration at start up with those registered from the outset. The exception is a study by Perry et al. (2007). Analyzing World Bank survey data on 355 formal enterprises that delayed registration across seven Latin American countries (104 in Colombia, 72 in Argentina, 72 in Bolivia, 66 in Mexico, 20 in Peru, 12 in Uruguay, and 9 in Panama), the finding is that they "at least initially, exhibit on average, much lower levels of output per worker, after controlling for firm size, time in business, sector and region" (Perry et al., p. 173). However, this is a small sample, the productivity gap is statistically significant in only four of the seven countries, and the average national figure of 29% lower productivity for those delaying registration is skewed by the Peru figure where the productivity gap is over 50%, which is not statistically significant, and only 20 unregistered start ups were surveyed.

It is not only the weak evidence base that intimates a need to analyze this relationship between delaying registration and firm performance. There are strong theoretical rationales for doing so. For entrepreneurs to survive and grow, they must gain legitimacy (Scott,

2008), which refers to "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions" (Suchman, 1995, p. 574). From an institutional perspective, the conventional liabilities of newness view that nonregistered start ups lack legitimacy fails to recognize that although lacking legality in relation to the codified laws and regulations of formal institutions, informal entrepreneurs are often socially legitimate in relation to the norms, values, and beliefs that constitute the informal institutions (Siqueira et al., 2016; Webb et al., 2009) and thus have legitimacy with their stakeholders (e.g., consumers, suppliers, and employees). This is especially so in developing countries where, as discussed above, both formal institutional imperfections and/or institutional incongruence are greater (Kistruck et al., 2015; Webb et al., 2013, 2014).

By achieving some level of legitimacy with their stakeholders without having to register, enterprises that delay registering can at least initially avoid the formal institutional costs of registration (e.g., paying direct and indirect taxes, burdensome regulations) and the additional ancillary costs imposed on formal enterprises by corrupt public sector officials (Tonoyan, Strohmeyer, Habib, & Perlitz, 2010). Moreover, it can be argued that the benefits of registration (e.g., access to credit, opportunities to engage with large firms and procure government contracts, reduced harassment by officials, and access to broader training and support programs) in developing countries might be insufficient to outweigh the benefits of nonregistration, especially in the early stages. McKenzie and Sakho (2010) in Bolivia and McCulloch, Schulze, and Voss (2010) in rural Indonesia find that registration only increases firm profitability and sales growth for mid-sized firms, suggesting that delaying registration until firms reach a certain size may be optimal. Meanwhile, McKenzie and Woodruff (2006) find in Mexico that microbusinesses often view the added value of registration as limited, not least because they are often run by individuals waiting to enter salaried jobs or doing so to supplement the income from their formal job, so for them, business expansion may not be a central motivation and registration is thus irrelevant and potentially costly. Registration, therefore, can be portrayed as simply another significant cost imposed by the formal institutional environment that comes with little benefit in many developing countries. Initial nonregistration, in consequence, may enable new ventures to outperform those registered from the outset since they have the prerequisite of legitimacy but without suffering the costs of registration (Kistruck et al., 2015; La Porta & Schleifer, 2014).

By avoiding this cost, those delaying registration may also lay a stronger foundation by being able to focus their scarce resources on overcoming other internal and external liabilities of newness (Stinchcombe, 1965). Internally, a new venture may lack operational routines, as well as camaraderie, trust, and cohesion, resulting in significant competitive (e.g., cost) disadvantages relative to more established competitors. Members must therefore learn unfamiliar roles, which requires significant time and other resources and in turn, may lead to internal inefficiencies and missed opportunities. Externally, new ventures' lack of a track record makes it difficult for them to convince potential stakeholders (e.g., investors, customers, suppliers) to conduct business with them. Without these external resources (e.g., capital, sales, raw materials) however, a new venture cannot survive. By avoiding the costs of registration, resources can be potentially devoted to overcoming these other liabilities of newness, thus enabling them to outperform those devoting resources to registration, which may reap few benefits in developing countries. It can be consequently proposed that delaying registration may give new ventures a head start that enables them to forge ahead of those registered from the outset in terms of firm performance.

Until now, nevertheless, with the exception of the small study by Perry et al. (2007) discussed above, no studies have evaluated whether delaying registration until later results in higher subsequent firm performance. Therefore, the following hypothesis can be tested:

**Hypothesis 1**: Enterprises starting up unregistered and then registering display higher subsequent levels of firm performance than those starting up registered.

## Impacts of Length of Nonregistration on Firm Performance

Competing views also exist on how the length of time spent unregistered before registering influences future firm performance. From the conventional liabilities of newness perspective that unregistered enterprises lack legality and are worse performing, increasing the length of time spent lacking legality would further heighten the deleterious impacts of nonregistration on future firm performance. Unable to grow and expand due to their lack of legality, reliability, and accountability, and ability to be perceived as competent, effective, and worthy, the longer they remain unregistered the worse would be their future firm performance relative to enterprises registered from the outset (Farrell, 2004; Palmer, 2007).

However, from an institutional perspective that recognizes that nonregistration does not automatically result in a lack of social legitimacy in the developing world, the longer they spend unregistered, the higher might be their future firm performance. First, this is because the longer they delay registration, the longer they avoid the high ongoing costs of registration (e.g., burdensome regulations, paying direct and indirect taxes, and bribes to corrupt public officials), and second, because they have longer to lay a stronger foundation by focusing their resources on overcoming other liabilities of newness. This will be particularly beneficial in contexts where "weak" formal institutions fail to provide sufficient benefits to warrant formalization (Kistruck et al., 2015; Wunsch-Vincent, de Beer, & Fu, 2015) and the costs of registration thus outweigh the benefits.

Although in the developed world, therefore, the point where the benefits of registration outweigh the costs of continuing unregistered may be quickly reached, this is less likely and may be much longer in developing countries where entrepreneurs live in transient poverty (fluctuating between different degrees of poverty) and the costs of registration may lead to major financial difficulties (Hulme & Shepherd, 2003), while the weak formal institutions result in fewer benefits from registration (De Mel, McKenzie, & Woodruff, 2012; Thai & Turkina, 2014). As such, the following hypothesis can be tested:

**Hypothesis 2**: The longer start ups spend unregistered before registering, the higher is their future firm performance.

# Methods

## Data and Variables

***Data.*** To evaluate these hypotheses, WBES data is analyzed from 127 developing countries, including 41 in Africa, 13 in East Asia and the Pacific region, 29 in Europe and

Central Asia, 31 in Latin America and Caribbean, 7 in the Middle East and North Africa, and 6 in South Asia. Of these, 25 are low income countries, 42 lower middle income countries, 36 middle income countries, 4 upper middle income countries, and 20 high income countries. All world regions and development levels are thus covered.

In each country, the WBES collects data using a stratified random sample of nonagricultural formal private sector businesses with five or more employees, which is stratified by firm size, business sector, and geographic region. The firm size strata in the WBES are 5–19 (small), 20–99 (medium), and 100+ employees (large-sized firms), while sector is broken down into manufacturing, services, transportation, and construction. Public utilities, government services, health care, and financial service sectors are not included, and in larger economies, manufacturing subsectors are selected as additional strata on the basis of employment, value-added, and total number of establishments. Geographical regions within a country are selected based on which cities/regions collectively contain the majority of economic activity. The sampling frame is derived from the universe of eligible firms, normally obtained from the country's statistical office or another government agency such as the tax or business licensing authorities. Since 2006, all national surveys explain the source of the sample frame. To deal with nonresponse, the sampling strategy factors in a 25% nonresponse rate per stratum, so that there are sufficient valid responses to compute performance indicators with the required precision level.

To collect data, a harmonized questionnaire is used across all countries, answered by some 1200–1800 business owners and top managers in larger economies, 360 in medium-sized economies and 150 in smaller economies. Although 135 countries are covered by the WBES and data is available from 2002 to 2014, the sample here is restricted to the 127 countries that since 2006 have used the harmonized questionnaire and common methodology, which assures that data is comparable across countries and over time.

***Dependent Variables.*** To evaluate the relationship between delaying registration and future firm performance, the dependent variables are the three key firm performance measures on which the WBES collects data, namely: (1) *Real annual sales growth* (using GDP deflators) (%): this is a derived variable in the WBES measuring the change in sales reported in this fiscal year from a previous period. For most countries the difference between the two fiscal year periods is 2 years. However, for some countries the interval is 3 years. Hence, an annualized measure is used. All values for sales are converted to USD using the exchange rate in the corresponding fiscal year of the survey. Sales are deflated to 2009 using the USD deflator, (2) *Annual employment growth* (%): this is a derived variable in the WBES measuring the annualized growth of permanent full-time workers expressed as a percentage. Annual employment growth is the change in full-time employment reported in the current fiscal year from a previous period. For most countries the difference between the two fiscal year periods is 2 years. However, for some countries the interval is 3 years. Hence, an annualized measure is used. And (3) *Annual productivity growth* (%): this is a derived variable that measures annualized growth in labor productivity where labor productivity is real sales (using GDP deflators) divided by full-time permanent workers. Annual productivity growth is the change in labor productivity reported in the current fiscal year from a previous period. For most countries the interval is 2 years. However, for some countries it is 3 years. Hence, an annualized measure is used.

***Key Independent Variables.*** To evaluate the influence of these formal enterprises starting up unregistered on future firm performance, two indicators are used: (1) *Started unregistered*: A firm-level measure that examines responses to the question, "*Was this*

*establishment formally registered when it began operations*?" This is a dummy variable with value 1 indicating that the firm started operations in the country without formal registration and 0 when the firm was formally registered, and (2) *Years unregistered*: A continuous variable counting the number of years the firm operated without formal registration. This variable has value 0 for firms that were registered from the outset. It is computed by analyzing the responses to three questions: "*In what year did this establishment begin operations*?", "*Was this establishment formally registered when it began operations*?", and "*In what year was this establishment formally registered*?", The average number of years operating without registration is computed only for firms stating they were not formally registered when starting operations in the country.

***Control Variables.*** To measure whether formal enterprises starting up and spending varying amounts of time unregistered witness different levels of firm performance than enterprises registered from the outset, it is necessary to control for other key determinants of firm performance. Here, nine characteristics are controlled for which previous studies reveal significantly influence firm performance, namely firm age, firm size, legal status, ownership structure, sector, access to finance, the level of technological innovation, human capital factors, and other business environment factors.

Firm age is controlled for since the long-standing liabilities of newness perspective, as discussed, views nascent enterprises as poorer performing (Stinchcombe, 1965). Firm age is a continuous variable for the number of years since the firm was established. Firm size, meanwhile, is controlled for since larger firms perform better than smaller ones (Hsieh & Olken, 2014; La Porta & Schleifer, 2014), not least due to the lower average unit costs in larger firms. Firm size is a categorical variable with value 1 for small firms with less than 20 employees, value 2 for medium size firms between 20 and 99 employees, and value 3 for large firms with more than 100 employees.

Different types of ownership structure and legal status are also strongly correlated with firm performance, including whether a firm is state-owned or privately owned, foreign- or domestic-owned and an open- or closed-shareholding, partnership, or sole proprietorship (Barbera & Moores, 2013; Baghdasaryan & la Cour, 2013). Given that unregistered start ups may have different ownership structures and legal statuses than registered start ups, controlling for this is important. Here, legal status is a categorical variable indicating whether the enterprise is an open- or closed-shareholding, a sole proprietorship, a partnership, a limited partnership, or any other form. In addition, whether the organization is foreign- or domestic-owned is examined using a dummy variable with value 1 indicating if the share of the firm's ownership held by foreign individuals or enterprises is larger than 49% and 0 otherwise. Given that export-oriented firms display higher levels of firm performance (La Porta & Schleifer, 2008), export-orientation is also included as a control using a dummy variable with value 1 for firms exporting directly at least 1% of sales and 0 for those who sell only domestically.

Firm performance also varies across economic sectors (Nabar & Yan, 2013; Siqueira et al., 2016). Given that those delaying registration may be concentrated in labor-intensive sectors with fewer returns to scale (Perry et al., 2007), controlling for sector is important. Sector is here a categorical variable indicating the sector of the firm (i.e., textiles, leather, garments, food, metals and machinery, electronics, chemicals and pharmaceuticals, wood and furniture, nonmetallic and plastic materials, auto and auto components, other manufacturing, retail and wholesale trade, hotels and restaurants, and others).

Access to finance is strongly correlated with firm performance, and given a burgeoning literature on how unregistered start ups lack access to finance from formal lenders, this may well influence firm performance because they scale down operations and the

high cost of informal loans and limited financing available lead them to substitute (low skilled) labor for physical capital (Amaral & Quintin, 2006). Access to bank loans or credit is a dummy variable with value 1 indicating the firm has access to bank loans or to a line of credit to finance its activities and 0 otherwise.

Firm performance is also often associated with the level of technological innovation (Mansury & Love, 2008). Given the lower innovation and adoption of new technologies in informal enterprises, and that which does exist is more adaptation and imitation (Wunsch-Vincent et al., 2015), controlling for this is important, especially given that some view this as the key reason for the productivity gap between developed and developing economies (Farrell, 2004; Palmade, 2005). Here, three variables available in the WBES are used: quality certification, a dummy variable with value 1 indicating the firm has an internationally recognized certification and 0 otherwise; presence of a website, a dummy variable with value 1 when the firm uses a website for business-related activities and 0 otherwise; and the use of e-mail, a dummy variable with value 1 when a firm uses e-mail to interact with clients and suppliers and 0 otherwise.

Human capital factors, such as the educational level, skills, and experience of the owners, managers, and the workforce; the level of professionalism; and whether there is numerical flexibility in the workforce, impact on firm performance (Black & Lynch, 1996; Gennaiolo, La Porta, Lopez-de-Silanes, & Shleifer, 2013; La Porta & Schleifer, 2014; Van der Sluis, Van Praag, & Vijverberg, 2005). Controlling for human capital factors is thus important, especially given that informality is associated with less productive workers due to more productive workers self-selecting formal over informal enterprises (Amaral & Quintin, 2006). Here, six control variables in the WBES are used: top manager's experience, a continuous variable of the years of experience the top manager has in the sector; temporary workers, a variable measuring the average number of temporary workers in the firm; permanent full-time workers, a continuous variable of the average number of permanent full-time workers in the firm; female full-time workers, examining the share of permanent full-time workers that are female; female involvement in ownership, a dummy variable with value 1 indicating whether women are involved in the ownership of the firm and 0 otherwise; and as a signal of professionalism, a dummy variable with value 1 indicating the firm has its annual financial statement reviewed by an external auditor and 0 otherwise.

So too does the wider business environment determine firm performance. To control for this, two variables are used, namely: transport, a dummy variable with value 1 indicating that transportation is a major constraint for the firm's activity and 0 otherwise, and electricity, a dummy variable with value 1 indicating that electricity supply is a major constraint for the firm's activity and 0 otherwise.

***Multiple Imputation of Missing Values.*** The method of multiple imputation of missing values is used to solve the missing data problem in survey data. Its objective is to substitute the missing values with the values computed using the observed variables. As cross-country datasets like WBES suffer from missing information, this is addressed by applying multiple imputation methods (through a system of chained equations) to the sample used in the estimation. In this dataset, the average number of imputed missing values across variables with missing information is 6,611 (with a maximum of 30,122 and a minimum of 231). Based on the classical methodological literature on multiple imputations (Collins, Schafer, & Kam, 2001; Rubin, 1987; Schafer & Graham, 2002), 10 imputations are used. This increases the reliability of the imputed dataset compared with the original

one. However, we also here conduct analysis without imputation to demonstrate the robustness of the findings.

***Multilevel Modeling.*** To evaluate the impact of delaying registration on firm performance across the 127 countries in the WBES for the period 2006 to 2014, we apply multilevel techniques. Given that the surveyed enterprises in the WBES are clustered across country-year subsamples, multilevel modelling is the optimal technique to elicit unbiased standard errors as well as reliable statistical comparisons. In the standard regression model, a single random residual adjusts the prediction to the observed value for each individual observation.

$$y_i = \beta_0 + \beta_1 x_1 + \cdots + \beta_n x_n + \varepsilon_i \tag{1}$$

In contrast, the *random intercept model* decomposes the residual into two random terms, one for the individual and the other for the aggregate level (Snijders & Bosker, 2012):

$$y_{ij} = \gamma_{00} + u_{0j} + \varepsilon_{ij} \tag{2}$$

where $\varepsilon_{ij}$ remains the individual-level (in our case firm-level) error term and $\gamma_{00}$ the average intercept for all countries. Here, the constant term ($\beta_{0j}$) is the result of two separate components; $u_{0j}$ is the random noise correcting the average intercept to each country observation. This second random term is a type of latent variable capturing the specificity of each cluster that can eventually be explained by modelling the variation existing within and across clusters under a full model specification. The decomposition of the regression error into $u_{0j}$ and $\varepsilon_{ij}$ allows for a proper quantification of the effect of the clustering of individual observations and a reliable estimation of the effect of the individual variables (that can be placed at either Level 1, Level 2, or both). Random effects can be added to the slope of individual-level independent variables. This relaxes the assumption that the effect of a given predictor is equal across aggregate level units of analysis. In this case, the slope of a given predictor $\beta_{1j}$ is decomposed into an average impact ($\gamma_{10}$) and a group-specific one ($u_{ij}$). The complete model specification is thus the following:

$$y_{ij} = \gamma_{00} + u_{0j} + y_{10} x_{1j} + u_{1j} + \cdots + \beta_n x_n + \varepsilon_{ij} \tag{3}$$

Here, we use random slope and random constant models to estimate the average impact of delaying registration on firm performance across countries and years unregistered, accounting for how the size of informal economy and years unregistered varies between countries (La Porta & Schleifer, 2014; Schneider & Williams, 2013). The number of countries analyzed is not drawn from a random sample to infer regularities in the broader population, but represents the universe, namely 127 countries. This means that we do not need to treat combinations of country-years as the Level 2 units but that the average effect of years unregistered can be estimated. That is, our Level 2 only considers the clustering of firms at the country level while, as mentioned above, the multilevel regressions include year dummies to control for time fixed effects at the firm level. Finally, as is customary in multilevel modeling, to interpret the results we center all control variables around each country at the aggregate level (group mean centering). While centering independent variables is advisable in random intercept models to interpret the average constant in the model, it is of key importance in the random slopes models used here to give a substantive interpretation to the intercept and the random components of the constant (Cebolla, 2013). The only explanatory variables not centered around the group mean are the two indicators of

informal entrepreneurship, as in both cases the value 0 has a substantive interpretation for this article (started business registered in one case, and spent 0 years unregistered in the other).

### Sample Selection Bias Correction: The Heckman Method

Using imputed data and the multilevel modelling framework, but without accounting for sample selection bias, any findings for hypothesis 2 may conflate the effect of being unregistered at start up with the effect of years spent unregistered. To address this, we apply Heckman's two-step estimator on the nonimputed dataset by estimating a first-stage model that predicts the likelihood of registration at start up and including the correction factor in the second-stage model that predicts firm performance. Registration is an endogenous choice of firms. As such, the sample of firms available for analysis cannot be taken as random. Rather, the sample is a sample of firms with a systematic pattern of registration. In the Heckman selection model, firm performance can be modeled, controlling for this sample selection bias problem.

The Heckman two-stage modeling helps address the endogeneity issue (i.e., unobserved heterogeneity between registered and unregistered firms) but does not necessarily remove the need to control for the main effect of "started unregistered" when estimating the impact of "years unregistered." Therefore, in all three regression equations (i.e., sales, employment, and productivity), we account for the "started unregistered" status of the firms under consideration.

With regard to the identification strategy, we argue that institutional circumstances are critical in affecting the endogenous decision of firms to register or not. In the WBES data, a variable captures the level of trust and confidence that firms have in government/public institutions such as the courts and dealing with regulatory bodies. After defining a binary variable which assumes a value of 1 if firms have trust and confidence in the impartiality or fairness of public institutions that they deal with and a value of 0 otherwise, we include it in the first stage and exclude it in the primary equation (i.e., the second-stage sales, employment, and productivity equations) for identification. We believe that this trust and confidence variable affects the registration decision but not performance directly. In other words, trust is indicative of the confidence of entrepreneurs while interacting with public officials, which is potentially one of the significant factors affecting firms' registration status but unlikely to affect annual growth rate of sales, employment, and productivity of firms directly.

## Results

Means, standard deviations, and correlations of the dependent and key explanatory variables are provided in Table 1. The correlation statistics suggest no problem of multicollinearity.

Of the 95,522 formal private sector businesses with five or more employees surveyed in the WBES between 2006 and 2014 across 127 developing economies, 10.2% had not been registered at the commencement of operations. To analyze whether delaying registration and the length of time they remained unregistered impacts subsequent firm performance, when other key firm-level determinants of firm performance are introduced and held constant (e.g., firm size, firm age, technology, and sector across countries), Table 2 reports the results of the random intercept and random slopes multilevel models for the

Table 1

Descriptive Statistics and Correlations for the Dependent and Key Explanatory Variables (Combined Multiple Imputation Descriptive Statistics and Correlations After 10 Imputations)

| Variables | Mean | Min | Max | SD | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|---|
| 1 Sales | 7.47 | −100 | 100 | 29.70 | 1 | | | | |
| 2 Employment | 5.45 | −100 | 100 | 17.37 | 0.20* | 1 | | | |
| 3 Productivity | 2.58 | −100 | 100 | 31.42 | 0.85* | −0.32* | 1 | | |
| 4 Started unregistered | 0.10 | 0 | 1 | 0.30 | −0.01* | 0.03* | −0.02* | 1 | |
| 5 Years unregistered | 0.88 | 0 | 195 | 5.07 | −0.01* | −0.02* | 0.00* | 0.36* | 1 |

*$p < .01$ (N = 95,522)
*Source*: WBES 2006-2014 data set; own calculations.

three measures of firm performance. The random intercept specification to recall, takes into account country-level specific differences on firm performance whereas the introduction of random slopes for the key independent variables allows for the varying impact of these determinants on firm performance due to country-specific differences.[1]

Evaluating hypothesis 1 regarding whether formal enterprises starting up unregistered display higher levels of firm performance than those starting up registered, model 1 in Table 2 reveals that once other firm-level determinants of firm performance are controlled for, formal enterprises that started up unregistered have an annual average sales growth rate 1.4 percentage points greater (i.e., 8.6% compared with 7.2%) and thus 19.4% higher than firms starting up registered, model 2 that they have an annual average employment growth rate 1.7 percentage points greater (i.e., 6.6% compared with 4.9%) and thus 34.7% higher than enterprises starting up registered, and model 3 that starting up unregistered has no significant deleterious impact on their annual productivity growth rate, which is 0.09 percentage points lower than those registered from the outset. For these formal enterprises, delaying registration thus resulted in a significant boost to their average annual sales and employment growth rates, and did not affect annual productivity growth rates.

Models 4 to 6 in Table 2, meanwhile, evaluate whether the longer formal enterprises spend unregistered before registering, the higher is their future firm performance. These partially confirm H2. For each year a firm remains unregistered before registering, annual sales growth rates are 0.15 percentage points higher (in model 4) and annual employment growth rates are 0.18 percentage points higher (in model 5) than for firms that started-up registered. As model 6 shows however, there is no such significant premium from remaining unregistered for longer for annual productivity growth rates.

These findings in Table 2 on the relationship between length of nonregistration and firm performance, however, may conflate the effects of being unregistered at start up with the effect of years spent unregistered. To control for sample selection bias and in order to

1. The intraclass correlation parameter estimated across the models (between 12 and 21%) suggests that country-level characteristics play an important role in firm performance. The introduction of random intercepts and random slope in our multilevel specifications aims to partially account for these differences.

Table 2

Linear Multilevel Regression for the Impact of Informal Entrepreneurship on Firm Performance (Combined Multiple Imputation Results After 10 Imputations)

| | Sales | Employment | Productivity | Sales | Employment | Productivity |
|---|---|---|---|---|---|---|
| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
| Informal entrepreneurship | | | | | | |
| Started unregistered | 1.41*** (0.49) | 1.76*** (0.28) | −0.09 (0.47) | | | |
| Years unregistered | | | | 0.15*** (0.05) | 0.18*** (0.02) | −0.01 (0.05) |
| Firm age | −0.28***(0.02) | −0.31*** (0.01) | −0.00 (0.02) | −0.28*** (0.02) | −0.32*** (0.01) | 0.01 (0.02) |
| Exporter | −0.18 (0.18) | −0.04 (0.06) | −0.13 (0.19) | −0.20 (0.19) | −0.04 (0.06) | −0.15 (0.19) |
| Foreign ownership | 0.06 (0.12) | 0.02 (0.04) | 0.07 (0.12) | 0.08 (0.12) | 0.01 (0.04) | 0.08 (0.12) |
| Workforce | | | | | | |
| Top manager's experience | −0.04*** (0.01) | −0.06*** (0.01) | 0.01 (0.01) | −0.04*** (0.01) | −0.06*** (0.01) | 0.01 (0.01) |
| Temporary workers | 0.01*** (0.00) | 0.01*** (0.00) | 0.01** (0.00) | 0.01*** (0.00) | 0.01** (0.00) | 0.01** (0.00) |
| Permanent full-time workers | 0.01*** (0.00) | 0.01*** (0.00) | 0.00 (0.00) | 0.01*** (0.00) | 0.01*** (0.00) | 0.00 (0.00) |
| Female full-time workers | −0.01*** (0.00) | −0.03*** (0.00) | 0.02*** (0.00) | −0.01*** (0.00) | −0.03*** (0.00) | 0.02*** (0.01) |
| Female participation ownership | 0.05 (0.07) | 0.00 (0.02) | 0.07 (0.07) | 0.05 (0.07) | −0.01 (0.02) | 0.07 (0.07) |
| Bank loan/credit | −0.11 (0.08) | 0.03 (0.03) | −0.15* (0.08) | −0.11 (0.08) | 0.03 (0.03) | −0.14* (0.08) |
| Major constraints | | | | | | |
| Transport | 0.03 (0.10) | 0.07** (0.04) | −0.03 (0.11) | 0.02 (0.10) | 0.08*** (0.03) | −0.04 (0.11) |
| Electricity | −0.10* (0.06) | −0.02 (0.02) | −0.08 (0.06) | −0.09 (0.06) | −0.03 (0.02) | −0.06 (0.06) |
| Innovation & technology | | | | | | |
| Quality certification | −0.06 (0.11) | −0.01 (0.04) | −0.06 (0.12) | −0.07 (0.11) | −0.00 (0.04) | −0.07 (0.12) |
| External auditor | 0.01 (0.05) | −0.00 (0.02) | 0.00 (0.06) | 0.02 (0.06) | 0.00 (0.02) | 0.00 (0.06) |
| Website | 0.17 (0.11) | 0.02 (0.04) | 0.15 (0.12) | 0.17 (0.11) | 0.03 (0.04) | 0.15 (0.12) |
| E-mail | −0.01 (0.10) | 0.02 (0.03) | −0.03 (0.11) | −0.03 (0.10) | 0.00 (0.03) | −0.03 (0.11) |
| Firm size (R.C.: Small) | | | | | | |
| Medium | −0.10 (0.17) | −0.03 (0.06) | −0.08 (0.18) | −0.10 (0.17) | −0.02 (0.05) | −0.08 (0.18) |
| Large | 0.06 (0.17) | −0.01 (0.06) | 0.06 (0.17) | 0.06 (0.17) | −0.01 (0.05) | 0.06 (0.18) |
| Legal status (R.C.: Open shareholding) | | | | | | |
| Closed shareholding | −0.01 (0.19) | 0.14** (0.06) | −0.16 (0.20) | −0.05 (0.19) | 0.11* (0.06) | −0.16 (0.20) |
| Sole proprietorship | −0.03 (0.19) | 0.16** (0.06) | −0.20 (0.20) | −0.06 (0.19) | 0.14** (0.06) | −0.21 (0.20) |
| Partnership | −0.17 (0.20) | 0.15** (0.07) | −0.31 (0.20) | −0.21 (0.20) | 0.12* (0.06) | −0.32 (0.21) |
| Limited partnership | 0.03 (0.19) | 0.12* (0.06) | −0.11 (0.20) | −0.02 (0.19) | 0.08 (0.06) | −0.12 (0.20) |
| Other form | −0.60** (0.27) | 0.06 (0.09) | −0.68** (0.28) | −0.65** (0.27) | 0.03 (0.08) | −0.70** (0.28) |
| Industry Sector (R.C.: Textile) | | | | | | |
| Leather | −0.00 (0.23) | 0.06 (0.084) | −0.09 (0.25) | −0.01 (0.24) | 0.07 (0.08) | −0.09 (0.25) |
| Garments | 0.41 (0.26) | 0.04 (0.09) | 0.34 (0.27) | 0.41 (0.26) | 0.04 (0.08) | 0.34 (0.27) |

Table 2

Continued

| | Sales | Employment | Productivity | Sales | Employment | Productivity |
|---|---|---|---|---|---|---|
| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
| Food | −0.14 (0.25) | −0.06 (0.09) | −0.04 (0.26) | −0.15 (0.25) | −0.08 (0.08) | −0.03 (0.26) |
| Metals and machinery | 0.33 (0.29) | 0.12 (0.10) | 0.26 (0.31) | 0.38 (0.30) | 0.08 (0.09) | 0.31 (0.31) |
| Electronics | 0.79 (0.76) | 0.18 (0.25) | 0.68 (0.80) | 0.69 (0.77) | 0.17 (0.23) | 0.60 (0.80) |
| Chemicals, pharmaceutical | −0.17 (0.55) | 0.14 (0.18) | −0.28 (0.57) | −0.10 (0.55) | 0.22 (0.17) | −0.28 (0.57) |
| Wood, furniture | −0.03 (0.34) | 0.23** (0.11) | −0.26 (0.35) | −0.06 (0.34) | 0.22** (0.11) | −0.28 (0.36) |
| Nonmetallic, plastic materials | −1.44*** (0.37) | −0.23* (0.13) | −1.29*** (0.39) | −1.41*** (0.38) | −0.19 (0.12) | −1.29*** (0.38) |
| Auto, auto components | 2.03 (1.25) | 0.44 (0.42) | 1.59 (1.32) | 2.03 (1.26) | 0.57 (0.39) | 1.50 (1.31) |
| Other manufacturing | −0.02 (0.23) | 0.04 (0.08) | −0.05 (0.24) | −0.02 (0.23) | 0.02 (0.07) | −0.04 (0.24) |
| Retail and wholesale trade | −0.03 (0.18) | −0.01 (0.06) | −0.01 (0.19) | −0.02 (0.18) | −0.01 (0.06) | −0.01 (0.19) |
| Hotels and restaurants | −0.09 (0.29) | 0.12 (0.10) | −−0.21 (0.30) | −0.13 (0.29) | 0.12 (0.09) | −0.24 (0.30) |
| Other services | 0.19 (0.22) | 0.08 (0.07) | 0.11 (0.23) | 0.18 (0.22) | 0.06 (0.07) | 0.12 (0.23) |
| Other unclassified | −0.22 (0.21) | 0.17** (0.07) | −0.39* (0.22) | −0.21 (0.21) | 0.17** (0.07) | −0.38* (0.22) |
| Year dummies | YES | YES | YES | YES | YES | YES |
| *Constant (fixed)* | 11.24***(0.90) | 9.60***(0.30) | 2.66***(0.95) | 11.41***(0.92) | 9.82*** (0.29) | 2.63*** (0.96) |
| Random disturbance | | | | | | |
| *Constant* | 7.36 | 2.32 | 7.73 | 7.34 | 2.21 | 7.86 |
| *Slope*: Started unregistered | 2.01 | 1.46 | 1.90 | | | |
| *Slope*: Years unregistered | | | | 2.11 | 1.23 | 1.34 |
| ICC (%) | 21 | 12 | 21 | 21 | 12 | 21 |
| Observations | 95,522 | 95,522 | 95,522 | 95,522 | 95,522 | 95,522 |
| Countries | 127 | 127 | 127 | 127 | 127 | 127 |
| Model F test | 12.44 | 37.34 | 2.83 | 11.95 | 60.51 | 3.24 |
| Prob > F | .000 | .000 | .000 | .000 | .000 | .000 |

Significant at *$p < .1$; ** $p < .05$; and *** $p < .01$
Standard errors in parentheses.
*Source*: WBES 2006 − 2014; own calculations.

check the robustness of our findings, therefore, Table 3 reports the results of Heckman-based two-step estimations using the nonimputed dataset and a truncated sample that examines only firms that have been established in the last 45 years (given the difficulty of owners knowing whether or not a business started up unregistered or not beyond this time period). The results are similar to the ones we obtain if the overall sample is not truncated,[2] pointing to the robustness of our results.

2. Results based on the overall sample without truncation can be obtained from authors upon request.

Table 3

Heckman Two-Step Estimator for the Impact of Years Spent Unregistered and Unregistered Status at Start Up on Firm Performance (Second Stage or Primary Equation Estimates With Sample Selection Bias Correction and Truncated Sample)

| | Sales | Employment | Productivity |
|---|---|---|---|
| | Model 1 | Model 2 | Model 3 |
| Years spent unregistered | 0.09** (0.05) | 0.11** (0.02) | 0.10** (0.05) |
| Started unregistered | 1.05**(0.55) | 1.56***(0.20) | 1.62***(0.31) |
| Firm age | −0.17*** (0.01) | −0.17*** (0.01) | −0.01 (0.01) |
| Exporter | −0.00 (0.00) | −0.01*** (0.00) | 0.00 (0.00) |
| Foreign ownership | −0.00 (0.45) | −1.05*** (0.26) | 1.07** (0.47) |
| Workforce | | | |
| Top manager's experience | 0.03*** (0.01) | −0.06*** (0.01) | 0.04*** (0.01) |
| Temporary workers | 0.01 (0.01) | 0.01** (0.00) | 0.00 (0.00) |
| Permanent full-time workers | 0.00 (0.00) | 0.01*** (0.00) | −0.00** (0.00) |
| Female full-time workers | 0.00 (0.00) | −0.04*** (0.01) | 0.04*** (0.01) |
| Female participation ownership | 0.01*** (0.00) | 0.00 (0.00) | 0.01*** (0.00) |
| Bank loan/credit | 0.01*** (0.00) | 0.01*** (0.00) | 0.00 (0.00) |
| Major constraints | | | |
| Transport | 0.00 (0.00) | 0.00 (0.00) | −0.00 (0.00) |
| Electricity | −0.01*** (0.00) | 0.00 (0.00) | −0.02*** (0.00) |
| Innovation & technology | | | |
| Quality certification | 0.02*** (0.00) | −0.00 (0.00) | 0.02*** (0.00) |
| External auditor | −0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) |
| Website | 0.01*** (0.00) | 0.01*** (0.00) | −0.00 (0.00) |
| E-mail | 0.01** (0.00) | 0.015*** (0.00) | −0.00 (0.00) |
| Firm size (R.C.: Small) | | | |
| Medium | 1.69*** (0.31) | 2.88*** (0.17) | −0.93*** (0.32) |
| Large | 2.20*** (0.48) | 3.90*** (0.28) | −1.53*** (0.50) |
| Legal status (R.C.: Open shareholding) | | | |
| Closed shareholding | 1.82*** (0.60) | 2.08*** (0.34) | −0.24 (0.62) |
| Sole proprietorship | 1.04* (0.65) | 3.98*** (0.36) | −2.78*** (0.67) |
| Partnership | 1.79** (0.79) | 2.86*** (0.44) | −1.21 (0.81) |
| Limited partnership | 0.22 (0.75) | 2.24*** (0.42) | −2.78*** (0.77) |
| Other form | 3.19*** (1.07) | 3.16*** (0.60) | 0.47 (1.10) |
| Industry Sector (R.C.: Textile) | | | |
| Leather | 11.88*** (1.78) | 3.37*** (0.99) | 9.11*** (1.85) |
| Garments | −0.16 (0.71) | −0.29 (0.41) | −0.13 (0.73) |
| Food | 0.45 (0.66) | 0.58* (0.38) | −0.19 (0.68) |
| Metals and machinery | 1.08 (0.70) | −0.40 (0.41) | 1.47** (0.71) |
| Electronics | −0.78 (1.18) | −1.92*** (0.68) | 1.17 (1.21) |
| Chemicals, pharmaceuticals | 0.67 (0.77) | 1.74*** (0.45) | −1.08 (0.78) |
| Wood, furniture | −2.01** (1.01) | −0.25 (0.58) | −1.06 (1.04) |
| Nonmetallic, plastic materials | −2.47*** (0.74) | −1.08** (0.43) | −1.49** (0.77) |
| Auto, auto components | 0.19 (1.71) | 1.25 (0.99) | −0.64 (1.74) |
| Other manufacturing | −0.01 (0.68) | −0.95** (0.39) | 0.45 (0.70) |
| Retail and wholesale trade | 1.07* (0.62) | 2.18*** (0.35) | −1.19* (0.64) |
| Hotels and restaurants | −0.83 (0.84) | 0.26 (0.47) | −1.09 (0.87) |
| Other services | 1.88** (0.72) | 0.80** (0.41) | 1.11 (0.74) |
| Other unclassified | 2.41*** (0.80) | 0.11 (0.46) | 2.39*** (0.82) |
| Year dummies | YES | YES | YES |
| *Constant* | 7.91*** (1.20) | 4.67*** (0.59) | 2.87*** (1.27) |

Table 3

Continued

| | Sales | Employment | Productivity |
|---|---|---|---|
| | Model 1 | Model 2 | Model 3 |
| *Lambda* | 0.16 | 6.32*** | −0.01 |
| *S.E. of Lambda* | (0.99) | (0.48) | (1.09) |
| Observations | 60,693 | 60,367 | 60,755 |
| Countries | 127 | 127 | 127 |
| Model Wald Chi-square statistic | 2624.3*** | 2301.5*** | 2244.7*** |
| *p*-value of Wald | .000 | .000 | .000 |

Significant at *$p < .1$; ** $p < .05$; and *** $p < .01$
Standard errors in parentheses.
*Source*: WBES 2006–2014; own calculations.

Analyzing this truncated sample, and once other firm-level determinants of firm performance are controlled for, model 1 reveals that formal enterprises which started up unregistered have an annual average sales growth rate 1.05 percentage points greater (i.e., 8.3% compared with 7.25%) and thus 14.5% higher than firms starting up registered, model 2 that they have an annual average employment growth rate 1.56 percentage points greater (i.e., 6.5% compared with 4.94%) and thus 31.6% higher than enterprises starting up registered, and model 3 that they have an annual average productivity rate 1.62 percentage points higher (i.e., 3.9% compared with 2.28%) and thus 71% higher than enterprises registered from the outset. These findings thus support hypothesis 1. For each year a firm remains unregistered at start up, moreover, annual sales growth rates are 0.09 percentage points higher (in model 1), annual employment growth rates are 0.11 percentage points higher (in model 2), and annual productivity growth rates are 0.10 percentage points higher (in model 3) than for firms that started up registered, with the average firm remaining unregistered for 0.88 years. These results thus support hypothesis 2. The findings of the multivariate analysis based on the Heckman method with the truncated sample (Table 3) are thus consistent with the findings from the multilevel model (Table 2). Enterprises that spend longer unregistered outperform enterprises registered from the outset, with or without sample selection bias correction, as well as with or without imputation of the data, and whether or not the sample is truncated, pointing to the robustness of the parameter estimates.

Further robustness tests have checked whether the results are sensitive to potential outlying observations of our independent variables and also the three performance indicators (the dependent variables). These tests analyzed the kernel density of our dependent variables to evaluate the appropriateness of the normal distributional assumption underlying our estimation techniques and to identify the presence of any outliers. For the independent variables, we trimmed the top 1% (highest) and the bottom 1% (lowest) observations. The results of doing so had no effect on the sign and statistical significance of the estimates. For instance, the respective annual sales, employment, and productivity growth rates are 0.09, 0.11, and 0.10 percentage points higher for each year of

nonregistration, compared well with the respective figures of 0.10, 0.10, and 0.08 percentage points higher when the sample excluded the outlying observations.[3]

## Discussion

This analysis of WBES data from 127 countries reveals that 1 in 10 (10.2%) of the formal private sector businesses with five employees or more surveyed started up unregistered. These formal enterprises delaying registration subsequently outperformed those which started up registered, witnessing 14.5% higher average annual sales growth (i.e., 8.3% compared with 7.25%), 31.6% higher annual employment growth (i.e., 6.5% compared with 4.94%), and 71% higher annual productivity growth (i.e., 3.9% compared with 2.28%). Moreover, the longer they delayed registration, the significantly better are their annual sales, employment, and productivity growth rates, namely 0.09, 0.11, and 0.10 percentage points higher, respectively, for each year of nonregistration. Both hypotheses 1 and 2 are therefore supported.

These findings have important theoretical implications. Conventionally, registration has been viewed as enhancing legitimacy and reducing liabilities of newness (Bitektine, 2011; Suchman, 1995). This study reveals the need to rethink this relationship in developing countries. Institutional theory recognizes that when incongruence exists between formal and informal institutions, social legitimacy with stakeholders (e.g., consumers, suppliers, and employees) can be achieved without registration, and this study has shown that by delaying registration, enterprises appear to lay a stronger foundation for subsequent growth, perhaps due to being able to focus their resources on overcoming other liabilities of newness. These include the internal development of stronger operational routines, as well as camaraderie, trust, and cohesion, which reduces inefficiencies, as well as the external development of market acceptance and stable links with stakeholders (e.g., suppliers, customers, and investors), thus, enabling them to outperform those who devote resources to registration.

However, this is here propounded to be only the case with those enterprises who reduce their external liabilities of newness by establishing market acceptance and stable links with stakeholders (suppliers, investors, and/or customers) that are retained when they register. No advantages will be gained by delaying registration with regard to external liabilities of newness if the external networks are not relevant when they cross institutional boundaries and register. If enterprises delaying registration serve discrete and separate "bottom of the pyramid" markets with low-quality products using little capital (La Porta & Schleifer, 2014), then the external customer segments and broader relationships with suppliers and investors are unlikely to be transferable if they register. Indeed, it is precisely these unregistered enterprises operating in separate markets which find the costs of registration in terms of searching for and switching to a new network too costly (Demenet et al., 2015; Lyon, 2000; Rivera-Santos & Rufin, 2010; Webb et al., 2009), particularly with regard to suppliers and investors (Skousen & Mahoney, 2015), which perhaps helps explain the low proportion of unregistered enterprises transitioning to registration in developing economies (La Porta & Schleifer).

However, the outperformance of these enterprises delaying registration may not only be because they are able to devote resources to overcoming some of their other internal and external liabilities of newness, but also because the formal institutional imperfections

3. The detailed results of these sensitivity/robustness checks are available from the authors upon request.

in the developing world mean that the benefits of registration are insufficient to enable those registered from the outset to outweigh the benefits achieved by delaying registration (Scott & Haskei, 2015). Possible benefits of registration might include access to credit markets, property rights, training from formal institutions (for which informal institutions cannot act as an efficient substitute), belonging to business associations, contracts with large firms, and the ability to become more capital-intensive (Fajnzylber et al., 2011; Skousen & Mahoney, 2015). In many developing countries, however, registration appears from the results of this study to provide additional costs but insufficient benefits to outweigh the benefits gained by delaying registration. In future research, evaluation is thus required of whether the significant outperformance of those delaying registration is mostly due to them being able to devote more resources to overcoming other external and internal liabilities of newness, or largely due to the benefits of registration being insufficient to compensate those registering from the outset, as well as how the weight accorded to these factors varies across different developing economy contexts.

This has important policy implications. Given that the prevalence of unregistered enterprises in developing economies has a deleterious impact on economic development and growth (La Porta & Schleifer, 2014), governments have encouraged registration and formalization. To achieve this, the conventional policy approach, drawing on the Allingham and Sandmo (1972) rational economic actor model, has been to change the cost/benefit ratio regarding the costs of operating unregistered and benefits of registration, predominantly by increasing the penalties, and perceived and actual risks of detection (e.g., by increasing inspections) so as to increase the costs of operating unregistered. Viewed through the lens of institutional theory, however, this deals only with the effects of nonregistration, rather than the formal institutional imperfections and institutional incongruence that lead enterprises to operate unregistered, and disadvantage those registering from the outset.

To tackle the formal institutional imperfections, two changes are required in developing countries. Conversely, the cost/benefit ratio of registration needs to be improved to outweigh the cost/benefit ratio of nonregistration. First, this requires a simplification and reduction in the costs of registration, which studies in Kenya (Devas & Kelly, 2001), Uganda (Sander, 2003), Bolivia (Garcia-Bolivar, 2006), and Peru (Jaramillo, 2009) reveal lead to an increase in registration. Second, the benefits of registration need to be enhanced, although De Mel et al. (2012) in Sri Lanka find that even a financial offer equivalent to 2 months' profits led to only 50% of firms registering. This is perhaps because the mistrust in governments and fear of the high recurrent costs of registration need to be addressed (Maloney, 2004; McKenzie & Woodruff, 2006), along with the provision of higher levels of property rights protection (Marcoullier & Young, 1995; Nwabuzor, 2005; Thomas & Mueller, 2000), and improvements in the quality of governance, decreases in public sector corruption, and increases in the level of government intervention, such as social protection, which have been shown to reduce nonregistration and informality (Autio & Fu, 2015; Dau & Cuervo-Cazzurra, 2014; Klapper, Amit, Guillen, & Quesdada, 2007; Thai & Turkina, 2014).

Conversely, improvements in formal institutions in terms of tax fairness, redistributive justice, and procedural justice are also required. Fairness here refers to the extent to which entrepreneurs believe they are paying their fair share compared with others (Wenzel, 2004), redistributive justice to whether they receive the goods and services they feel that they deserve given the taxes they pay (Richardson & Sawyer, 2001) and procedural justice to the degree to which they believe that the tax authority has treated them in a respectful, impartial, and responsible manner (Braithwaite & Reinhart, 2000; Murphy, 2005).

Besides improvements in the formal institutional environment, measures are also required to alter the social legitimacy of operating unregistered so as to reduce institutional incongruence (and thus nonregistration). Once formal institutional improvements are in situ, this can be achieved by governments using advertising campaigns regarding the benefits of registration and costs of nonregistration, and providing information on the public goods and services they will receive from registration and formalization (Saeed & Shah, 2011).

These policy measures to improve formal institutions and reduce institutional incongruence should not perhaps be seen as a substitute for the conventional policy approach of increasing the costs of nonregistration by raising the perceived or actual risk of detection and/or penalties for nonregistration. Indeed, there are at least two ways of combining them. First, a "responsive regulation" approach starts out by facilitating entrepreneurs to self-regulate themselves in a manner consistent with the law (e.g., by reducing formal institutional imperfections and institutional incongruence). This facilitating of voluntary compliance is then followed by persuasion through enhancing the benefits of registration, and only as a last resort for the small minority still refusing to be compliant does it use punitive measures based on increasing the costs of nonregistration (Braithwaite, 2009; Job, Stout, & Smith, 2007). A second approach is the "slippery slope framework" (Kirchler, Hoelzl, & Wahl, 2008), which pursues both voluntary and enforced compliance concurrently by developing both greater trust in authorities (e.g., by reducing formal institutional imperfections and institutional incongruence) and the greater power of authorities by improving the benefits of registration and costs of nonregistration (Kogler, Muelbacher, & Kirchler, 2015; Muehlbacher, Kirchler, & Schwarzenberger, 2011; Wahl, Kastlunger, & Kirchler, 2010). Until now however, there has been no comparative evaluation of which sequencing and/or combination of measures is the most appropriate and/or effective means of fostering registration in different contexts.

## Limitations and Future Research

Although formal enterprises delaying registration and spending longer unregistered are shown to significantly outperform those registered from the outset of operations, there are nevertheless limitations to what can be concluded and caveats required. First, how the WBES measures both registration and firm performance could be considerably improved in future research. When measuring registration, the WBES simply asks "*Was this establishment formally registered when it began operations*?" Only if the respondent asks does the interviewer explain that this means registered with the most important institution for tax purposes (defined on a country by country basis). However, respondents may interpret registration in multifarious ways (e.g., possessing a local trading license, being registered under factories' or commercial acts, registered under professional groups' regulatory acts). The firm performance indicators analyzed in WBES, meanwhile, are also limited. Not only are there known difficulties with estimating the sales of the self-employed (Moock, Musgrove, & Stelcner, 1990; Vijverberg, 1995), but employment growth is only measured per full-time worker, rather than full-time equivalent worker, as is productivity, and solely labor productivity measured rather than total factor productivity, which would account for sources of productivity beyond labor, such as management quality, technological progress, and systems of government.

Neither has this analysis been able to identify either the reasons entrepreneurs initially operate unregistered (e.g., whether they are simply awaiting registration, deliberately test-trading on an unregistered basis to determine the venture's viability before registering, or

have no initial intention of registering) or the reasons enterprises register (e.g., better access to financing or markets, fewer bribes, better opportunities with formal firms, more access to government programs). Hence, analyzing whether different reasons for both being initially unregistered as well as registering influence subsequent firm performance is not possible. Future research needs to do this, both to explain the registration decision as well as to tailor policy measures. Nor does this dataset allow an examination of whether registered enterprises that delay registration outperform those registered from the outset in advanced economies, and thus whether a retheorization of liabilities of newness is also required in the rather different institutional environment of developed countries.

In sum, formal enterprises delaying registration and spending longer unregistered outperform those starting up registered, calling into question in the developing world the view that nonregistration leads to a lack of legitimacy, which acts as a liability of newness. If this now stimulates wider research on how the different reasons for being both initially unregistered and registering influence subsequent firm performance, as well as whether it is similarly the case in developed countries that enterprises initially avoiding the cost of firm registration, and focusing their resources on overcoming other liabilities of newness, lay a stronger foundation for subsequent growth, then one of its intentions will have been fulfilled. If this then leads to questions being raised about what policy approaches should be pursued toward nonregistration, this article will have achieved its fuller intention. What is certain, however, is that the currently dominant view of starting up unregistered as reducing legitimacy and representing a liability of newness has little or no evidence base in the developing world, and a policy approach of increasing the costs of nonregistration deals largely with the effects rather than causes, and should henceforth be complemented with measures to reduce formal institutional imperfections and institutional incongruence.

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