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EXPLAINING VARIATIONS IN THE COMMONALITY OF INFORMAL SECTOR COMPETITION ACROSS LATIN AMERICAN AND THE CARIBBEAN COUNTRIES

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To advance understanding of the relationship between entrepreneurship and the informal sector, the aim of this paper is to evaluate and explain variations in the extent to which formal enterprises witness competition from unregistered or informal enterprises across Latin American & Caribbean countries. Reporting World Bank Enterprise Survey (WBES) data on 31 Latin American and Caribbean countries, this reveals that two-thirds (65.5 per cent) of formal enterprises witness competition from informal sector enterprise. To explain the cross-country variations, four competing theories are evaluated which variously view the prevalence of the informal sector to be determined by either: economic under-development (modernization theory); high taxes and state over-interference (neo-liberal theory); too little state intervention (political economy theory), or an asymmetry between the laws and regulations of formal institutions and the unwritten socially shared rules of informal institutions (institutional theory). A probit regression analysis confirms the modernization, political economy and institutional theories, but not neo-liberal theory. Beyond economic under-development, therefore, it is too little state intervention and whether the laws and regulations developed by governments are in symmetry with the norms, values and beliefs of entrepreneurs. The paper concludes by discussing the theoretical and policy implications of these findings.

Keywords: entrepreneurship; informal sector; economic development; development economics; Latin American & Caribbean.

1. Introduction

Do formal enterprises witness competition from informal sector enterprises? And why is informal sector competition more common in some countries than others? Finding answers to these questions is important. It is now known that informal sector enterprises which do not register with, and/or declare some or all production and/or sales to, the authorities for tax, benefit and/or labour law purposes when they should do so (Ketchen et al., 2014; Siqueira et al., 2016; Williams et al., 2017), are a common feature across the global

economy. Throughout the world, two-thirds of all enterprises are unregistered at start-up (Autio and Fu, 2015), over a half of all current enterprises operate unregistered (Acs et al., 2013), and if the un-estimated number of formal enterprises under-reporting sales is included, an even higher proportion can be designated as operating in the informal sector (Williams, 2018).

Reviewing the literature, four rival theories have been used to explain the varying prevalence of unfair competition from informal sector enterprises. Firstly, modernization theory has contested that informal sector competitors are more prevalent when there is economic under-development (La Porta and Schleifer, 2014), secondly, neo-liberal theory has argued that the level of informal sector competition is higher when there are high taxes and too much state interference (De Soto, 2001). Thirdly, and conversely, political economy theory views higher informal competition as resulting from inadequate state intervention (Castells and Portes, 1989), and fourth and finally, institutional theory depicts informal competition to be more common when the laws and regulations of formal institutions are not in symmetry with the unwritten socially shared rules of informal institutions (Windebank and Horodnic, 2017; Webb et al., 2009, 2013, 2014). The aim of this paper is to evaluate these rival explanations for the variations across countries in the prevalence of informal sector competition.

To commence, section 2 reviews the rival theories explaining the variations in the prevalence of informal sector competition. The outcome will be a set of propositions that can be evaluated. Section 3 then reports the data, variables and methods used to test these propositions, namely a probit regression analysis of World Bank Enterprise Survey (WBES) on Latin American & Caribbean countries, followed in section 4 by the findings. Section 5 then concludes by discussing the theoretical and policy implications along with the limitations of the current research and future research required.

The outcome will be to advance scholarship on the relationship between the informal sector and entrepreneurship in three ways. Theoretically, this paper advances explanations for the varying prevalence of informal sector competition. In stark contrast to current debates that adopt one or other theoretical perspective, this paper will tentatively show there is a need to synthesize the modernization, political economy and institutional theories to more fully understand the cross-country variations in the prevalence of informal sector competition. Empirically, meanwhile, this paper reports for the first time the cross-country variations in the prevalence of informal sector competition across Latin America and Caribbean countries. Third and finally, and from the perspective of policy, the practical contribution is to show the need for a shift in policy approach when tackling informal sector entrepreneurship and enterprises.

2. Explaining Informal Sector Competition: theories and hypotheses

Over the past decade, a new sub-field of entrepreneurship scholarship has emerged that focuses upon understanding and explaining the relationship between entrepreneurship and

the informal sector (Aidis et al., 2006; Bureau and Fendt, 2011; Coletto and Bisschop, 2017; Kus, 2014; Mróz, 2012; Ram et al., 2017; Webb et al., 2009, 2013; Williams, 2018). This new sub-field has variously studied who participates in informal sector entrepreneurship (Thai and Turkina, 2014; Williams and Martinez-Perez, 2014) and whether they are necessity- and/or opportunity-driven (Adom and Williams, 2014; Maloney, 2004; Perry and Maloney, 2007), its variable prevalence (Autio and Fu, 2015; Williams and Kedir 2016, 2017a) and how this can be explained (Dau and Cuervo-Cazurra, 2014; Siqueira et al., 2016). Here, firstly, the emergent scholarship on the prevalence of entrepreneurship in the informal sector is briefly reviewed and secondly, the rival theories that explain cross-country variations in its prevalence.

2.1. Commonality of informal sector competition

A range of studies have estimated the prevalence of entrepreneurship in the informal sector in specific countries (e.g., Chepurensko, 2016; Godfrey and Dyer, 2015; London et al., 2014; Williams et al., 2016; Yu and Bruton, 2015). There are also a range of small cross-country studies of its prevalence. For example, comparing England, Russia and Ukraine, Williams (2008) finds that 23 per cent, 96 per cent and 51 per cent of entrepreneurs operate in the informal sector respectively. This study, nevertheless, is based on a survey of just 130 entrepreneurs in England, 331 in Ukraine and 81 in Moscow.

To provide a more comprehensive analysis of the cross-country variations, three data sets are available. Firstly, there is an International Labour Organization (ILO) dataset (ILO, 2011, 2012). Analyzing 38 countries, Williams (2018) reveals that 16.6 percent of the non-agricultural workforce engage in entrepreneurship in the informal sector as their main job. When those employed by these informal entrepreneurs are included, 31.5 per cent of the workforce in these 38 countries are either informal entrepreneurs or have their main job in informal enterprises. However, this varies from 38.8 per cent in sub-Saharan Africa to 20.6 per cent in Europe and Central Asia. In 16 (42 per cent) of the 38 countries, informal enterprises employ the majority of the (non-agricultural) labour force. Entrepreneurs operating in the informal sector, and the employment they create, in consequence, is not a minor aspect of these economies. However, marked cross-country variations exist in the share of the non-agricultural workforce with their main job in informal enterprises either as informal entrepreneurs or waged employees. This ranges from 73 per cent in Pakistan and 71.4 per cent in Mali through to 7.0 per cent in Moldova and 3.5 per cent in Serbia.

Secondly, the Global Entrepreneurship Monitor (GEM) can be analyzed. Examining 51 countries, Dau and Cuervo-Cazurra (2014) reveal that 3.37 informal enterprises are created annually for every 100 people. Using a similar measure, Autio and Fu (2015) find that two-thirds of enterprises start-up unregistered in emerging and transition economies (where 0.62 informal enterprises compared with 0.37 formal enterprises are created annually for every 100 people) as well as in OECD countries (where 0.62 informal enterprises compared with 0.43 formal enterprises are created annually for every 100 people). These studies derive such estimates by subtracting World Bank estimates of the

number of registered businesses from the GEM estimates of the total number of new enterprises in each country. Such estimates, therefore, must be viewed as tentative.

Third and finally, there is the World Bank Enterprise Survey (WBES). This collects data on whether formal enterprises started-up unregistered and whether they compete with the informal sector and if informal sector competition constrains their operations. Until now, this data-set has been rarely used when studying the relationship between entrepreneurship and the informal sector. One exception is a study of whether formal businesses started-up unregistered (Williams et al., 2017), but this does not analyse the reasons for the cross-country variations. Williams and Kedir (2018a) do so and reveal the importance of the modernization, political economy and institutional theories in explaining cross-country variations. Meanwhile, the WBES data on whether formal sector enterprises witness informal sector competition has been subject to little or no analysis. This dataset therefore represents an untapped resource.

2.2. Theorizations of the variable commonality of informal sector competition

Turning to rival theories for the cross-country variations in the prevalence of informal sector entrepreneurship, four competing explanations exist. These explain greater levels of informal entrepreneurship to result from either: economic under-development (modernization theory); high taxes and state over-interference (neo-liberal theory); inadequate state intervention (political economy theory), or the asymmetry between the laws and regulations of formal institutions and the unwritten socially shared rules of informal institutions (institutionalist theory).

Most studies explaining informal sector entrepreneurship have done so using just one or other of these rival theories, such as modernization theory (e.g., La Porta and Shleifer, 2008, 2014), neo-liberal theory (e.g., De Soto, 1989), political economy theory (e.g., Castells and Portes, 1989; Davis, 2006; Slavnic, 2010), or institutional theory (e.g., Webb et al., 2009). Recently, however, scholarship has emerged that asserts how these are not mutually exclusive theories. Analyzing the bivariate correlations between the structural conditions deemed important in each theory and the scale of the informal sector across the European Union (Williams, 2014a,b; Williams and Windebank, 2015), Central and Eastern Europe (Williams, 2015a,c), Latin America (Williams and Youssef, 2013, 2014) and the wider developing world (Williams, 2015b,d), the modernization, political economy and institutional theories have been confirmed and neo-liberal theory refuted. Multivariate regression analyses at the level of Central and Eastern Europe (Williams and Horodnic, 2015a), the Baltics (Williams and Horodnic, 2015b,c) and South-East Europe (Williams and Horodnic, 2015d) have reached the same conclusion. These studies, nevertheless, evaluate these theories in relation to the size of the informal sector, rather than the level of entrepreneurship in the informal sector.

There have also been studies evaluating these rival explanations for the cross-country variations in the prevalence of informal sector entrepreneurship. Using bivariate

correlations, these again confirm the modernization, political economy and institutional theories but not neo-liberal theory (Williams, 2014c,d). Multivariate regression analyses conducted, albeit confined to the European Union and only examining either the tendency of small businesses to pay their formal employees an additional undeclared (envelope) wage (Williams and Horodnic, 2016) or whether the self-employed conduct some of their transactions in the informal sector (Williams and Martinez-Perez, 2014), again conclude the same as the above studies.

Studies evaluating the varying level informal sector competition across countries have so far been confined to a study of 142 countries which again reveals the same finding that modernization, political economy and institutional theories apply but not neo-liberal theory (Williams and Kedir, 2018a), and a study of three South-Eastern European countries which shows that informal sector competition leads to poorer firm performance (Williams and Bezeredi, 2018b). To further advance understanding of the prevalence of informal sector competition, this paper will focus upon Latin America and the Caribbean countries to evaluate which, if any, of these theories are valid in this global region. To do so, each theory is now briefly reviewed to formulate hypotheses that can be tested.

Modernization theory, which dominated how the informal sector was conceptualized during the twentieth century, holds that the modern formal sector is becoming hegemonic and the informal sector fading from view. Informal enterprises, such as street hawkers, are portrayed as a leftover from an earlier pre-modern system of production and in demise. The persistence of informal and unregistered enterprises thus displays the level of “under-development” of a country (Geertz, 1963; Gilbert, 1998; Lewis, 1959). Formal enterprises are therefore more likely to witness informal sector competition in less economically developed countries, measured in terms of GDP per capita, and in countries where household consumption expenditure per capita is lower (ILO, 2012). The following hypothesis can be therefore tested:

Modernization hypothesis (H1): Formal enterprises are more likely to witness informal sector competition in less developed Latin American and Caribbean economies.

H1a: Formal enterprises are more likely to witness informal sector competition in less developed Latin American and Caribbean economies, measured in terms of GDP per capita.

H1b: Formal enterprises are more likely to witness informal sector competition in less developed Latin American and Caribbean economies, measured in terms of household consumption expenditure per capita.

Neo-liberal theory, meanwhile, asserts that informal and unregistered enterprise prevails due to high taxes and too much state interference in the market, which leads entrepreneurs to make the rational economic decision to exit the formal sector to avoid the costs, time and effort of operating formally (e.g., London and Hart, 2004; Nwabuzor, 2005; Small Business Council, 2004). For such neo-liberals, the informal sector arises due to

entrepreneurs being constrained by high taxes and state-imposed institutional constraints (De Soto, 1989, 2001; Perry and Maloney, 2007). In consequence, formal enterprises will be more likely to witness informal sector competitors in countries with higher taxes and greater state interference. To evaluate this neo-liberal explanation, the following hypothesis can be tested:

Neo-liberal hypothesis (H2): Formal enterprises are more likely to witness informal sector competition in countries with higher tax rates, and higher levels of state interference in the free market.

H2a: Formal enterprises are more likely to witness informal sector competition in Informal sector competition in countries with higher tax rates, measured by the tax revenue to GDP ratio.

H2b: Formal enterprises are more likely to witness informal sector competition in countries where state interference is greater, measured by the expense of government as a percentage of GDP.

In political economy theory, the informal sector is caused by an increasingly de-regulated open world economy in which outsourcing and subcontracting are used to bring informal entrepreneurship into contemporary capitalism, resulting in downward pressures on wages as well as incomes, welfare services and benefits (Aliyev, 2015; Dibben and Williams, 2012; Dibben et al., 2015; Harriss-White, 2014; Meagher, 2010; Portes, 1994). Such endeavor is seen as unregulated, precarious and low paid survival-driven activity conducted by those excluded from the formal labour market and unprotected by social protection systems; they are necessity-driven entrepreneurs (Castells and Portes 1989; Gallin, 2001; Sassen, 1996; Taiwo, 2013). As such, formal enterprises will be more likely to witness informal sector competition in countries with inadequate state intervention (Davis, 2006; Slavnic, 2010). To evaluate this political economy explanation, therefore, the following hypothesis can be tested:

Political economy hypothesis (H3): Formal enterprises are more likely to witness informal sector competition in countries with lower levels of state intervention.

H3a: Formal enterprises are more likely to witness informal sector competition in countries with lower tax to GDP ratios.

H3b: Formal enterprises are more likely to witness informal sector competition in countries where the expense of government as a percentage of GDP is lower.

For those adopting institutional theory, all the above theories do not explain why some entrepreneurs in a country engage in the informal sector and others do not. Institutional theorists have started to answer this (Baumol and Blinder, 2008; North, 1990). Institutions are the rules of the game that govern and prescribe behavior, and all societies possess on the one hand, formal institutions (i.e., laws and regulations) that set out the legal rules of the game, and on the other hand, informal institutions which are the unwritten socially

shared rules that exist outside of officially sanctioned channels (Helmke and Levitsky, 2004), and are expressed in norms, values and beliefs regarding what is right and acceptable (Denzau and North 1994). Formal sector entrepreneurship therefore takes place within the formal institutional prescriptions of the codified laws and regulations, whilst informal entrepreneurship takes place outside of formal institutional prescriptions but within the norms, values and beliefs of informal institutions (Godfrey, 2011; Kistruck et al., 2015; Siqueira et al., 2016; Webb et al., 2009, 2013, 2014; Welter et al., 2015; Williams and Bezeredi, 2018a; Williams and Gurtoo, 2017; Williams and Krasniqi, 2018).

For such institutional theorists, cross-country variations in the prevalence of informal sector enterprise result from the asymmetry between the laws and regulations of formal institutions and the norms, values and beliefs of informal institutions (Dau and Cuervo-Cazurra, 2014; Godfrey, 2015; Sutter et al., 2017; Thai and Turkina, 2014; Vu, 2014; Webb and Ireland, 2015; Williams and Shahid, 2016; Williams et al., 2017). The assertion is that the greater the degree of non-alignment between formal and informal institutions, the higher is the likelihood that formal sector enterprises will witness informal sector competition (Williams and Kadir, 2018a,b). To test institutional theory, therefore, proxy indicators of the level of institutional asymmetry are required. One such proxy indicator is the level of trust in formal institutions since the level of such “vertical trust” is a direct proxy of the level asymmetry between informal and formal institutions. Another proxy indicator is the perceived level of public sector corruption. When corruption is perceived to predominate, the greater is the level of institutional symmetry (Torgler, 2012). To evaluate institutional theory, therefore, the following hypothesis can be tested:

Institutional asymmetry hypothesis (H4): Formal enterprises are more likely to witness informal sector competition in countries where there is greater asymmetry between formal and informal institutions.

H4a: Formal enterprises are more likely to witness informal sector competition in countries where there is greater asymmetry between formal and informal institutions, measured in terms of trust in state institutions.

H4b: Formal enterprises are more likely to witness informal sector competition in countries where there is greater asymmetry between formal and informal institutions, measured in terms of the level of public sector corruption.

3. Data, Variables and Methods

3.1. Data

To evaluate the rival theories that variously explain the varying prevalence of informal sector competition, World Bank Enterprise Survey (WBES) data on 31 Latin American & Caribbean countries is here reported. Table 1 outlines the Latin American and Caribbean countries covered in this survey.

Table 1. Latin American & Caribbean countries list in the WEBS

Country	Survey year	Country	Survey year
Antigua & Barbuda	2010	Guyana	2010
Argentina	2006,2010	Honduras	2006,2010
Bahamas	2010	Jamaica	2010
Barbados	2010	Mexico	2006,2010
Belize	2010	Nicaragua	2006,2010
Bolivia	2006,2010	Panama	2006,2010
Brazil	2009	Paraguay	2006,2010
Chile	2006,2010	Peru	2006,2010
Colombia	2006,2010	St Kitts and Nevis	2010
Costa Rica	2010	St Lucia	2010
Dominica	2010	St Vincent & the Grenadines	2010
Dominican Republic	2010	Suriname	2010
Ecuador	2006,2010	Trinidad & Tobago	2010
El Salvador	2006,2010	Uruguay	2006,2010
Grenada	2010	Venezuela	2006,2010
Guatemala	2006,2010		

In each of these countries, the WBES collects data from non-agricultural formal private sector businesses with five or more employees using a stratified random sample. The sample 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 services sectors are excluded, and in larger economies, manufacturing sub-sectors are used as additional strata based on employment, value-added, and total number of establishments. Geographical regions within a country are stratified based on the cities/regions collectively containing 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.

The sample here is restricted to Latin American & Caribbean countries surveyed from 2006 to 2010, which have used the harmonized questionnaire and common sampling methodology, assuring that data is comparable across countries and over time.

3.2. Dependent variable

Past cross-country studies of informal entrepreneurship and enterprise have analyzed either the percentage of unregistered enterprises in a country or the percentage of formal enterprises that started-up unregistered (Dau and Cuervo-Cazurra, 2014; Kistruck et al., 2014; Siqueira et al. 2014; Thai and Turkina, 2014; Williams et al., 2017). Such measures

exclude formal enterprises that under-report a portion of their sales. Neither are these measures informative of whether these informal sector enterprises have a deleterious impact on the operation of formal enterprises. Here, therefore, to measure more fully the prevalence of informal sector entrepreneurship on formal entrepreneurship and enterprises, an analysis is undertaken of whether formal enterprises report that they witness informal sector competition. To do so, a WBES question is used that examines responses to the question, “Does this establishment compete against unregistered or informal firms? (yes, no)”. This is a dummy variable with a value of 1 if formal enterprises declare Yes and a value of 0 otherwise.

3.3. Key independent variables

To test the various theories that variously explain cross-country variations in the prevalence of informal sector competition, firm-level variables are used as controls and country-level variables that capture the tenets of the modernization, neo-liberal, political economy and institutional perspectives.

To analyse hypotheses H1-H4 regarding the key determinants, while holding constant the firm-level control variables, variables are employed that have been used in previous studies evaluating these hypotheses in relation to the informal sector (discussed in the previous section). To evaluate the modernization hypothesis (H1), the indicators used are:

- the current GDP per capita expressed in purchasing power parity in international dollars terms, transformed into natural logs. The IMF World Economic Outlook Database for the relevant year in which the survey was conducted in each country was used.
- Household consumption expenditure per capita, retrieved from the same source in the same manner, also transformed into natural logs.

Meanwhile, to test both neo-liberal theory (H2) and political economy theory (H3) that too much or too little state interference increases informal sector competition respectively, two indicators of the level of state intervention are employed, namely:

- Tax revenue to GDP ratio, from the IMF World Economic Outlook database.
- Expense of government as a % of GDP, which measures the size of government and is therefore a proxy of the level of state intervention. The expense of government is the level of cash payments for the operating activities of government in providing goods and services. It includes compensation of employees (e.g., wages and salaries), interest and subsidies, grants, social benefits, and other expenses such as rent and dividends, data from the IMF World Economic Outlook database.

To test institutional theory (H4), two proxy indicators of the level of asymmetry between the formal and informal institutions are used, namely:

- Trust in the court system, measured by the percentage of firms believing that the court system is fair, impartial and uncorrupted. This is based on the response to the following question: “I am going to read some statements that describe the courts system and how it could affect business. For each statement, please tell me if you strongly disagree, tend to disagree, tend to agree, or strongly agree”. This is a dummy variable with a value of 1

given to those firms who agree and strongly agree that “the court system is fair, impartial and uncorrupted” and a value of 0 for those who disagree or strongly disagree.

- **Corruption composite index:** a dummy variable which indicates whether the entrepreneur asserts that an informal gift or payment was expected or requested to “get things done” in relation to customs, taxes, licenses, permits, regulations and services. It takes a value of 1 if the responding entrepreneur reported that this was expected or requested in one or more cases, and value 0 otherwise.

3.4. Other control variables

To control for other key explanatory variables that may also affect whether a formal enterprise witnesses informal sector competition, a series of mostly firm-level variables are used. These are derived from past studies of the WBES data (Hudson et al. 2012; Williams and Kedir 2017b; Williams et al. 2017) and other studies of entrepreneurship and enterprise in the informal sector (Dau and Cuervo-Cazurra, 2014; Hodosi, 2015; Khan and Quaddus, 2015; Vu, 2014). These firm-level control variables are:

- **Firm age:** a continuous variable indicating the number of years since the firm was established.
- **Foreign-owned:** 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 per cent.
- **Export-orientation:** a dummy variable with value 1 indicating the proportion of firm’s sales which are for the export market and 0 for the share of sales for the domestic market.
- *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, and
- **Female involvement in ownership**, a dummy variable with value 1 indicating whether women are involved in the ownership of the firm and 0 otherwise.
- **Quality certification**, a dummy variable with value 1 indicating the firm has an internationally-recognized certification and 0 otherwise;
- **External auditor**, a dummy variable with value 1 indicating the firm has its annual financial statement reviewed by an external auditor 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
- **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.
- **Firm size:** a categorical variable with value 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.

- Legal status: a categorical variable indicating whether the legal form of the firm is an open shareholding, a closed shareholding, a sole proprietorship, a partnership, a limited partnership, or any other form.

Table 2 summarizes the variables described above.

Table 2. Summary statistics

Variables	Obs	Mean	Std	Min	Max
Informal competition	16445	65.47	47.55	0	100
Ln (GDP per capita)	25587	9.15	0.45	8.15	10.30
Ln (Household consumption expenditure per capita)	21598	7.97	0.57	6.54	9.45
Expense of government as a percentage of GDP	25587	26.06	6.74	14.53	39.43
Tax revenue to GDP ratio	16170	16.01	4.07	10.44	28.26
Corruption	21696	14.73	10.35	0	58.11
Trust	25587	0.25	0.44	0	1
Firm age	25243	23.53	18.99	0	195
Exporter	25587	15.05	35.76	0	100
Foreign ownership	25072	11.43	31.82	0	100
Top manager experience	24811	21.49	11.99	0	60
Temporary worker	24856	8.87	32.22	0	900
Permanent full-time worker	25319	88.22	217.42	0	4585
Female full-time worker	20443	34.46	26.29	0	100
Female ownership share	23991	36.52	48.15	0	100
Quality certification	24716	20.95	40.70	0	100
External auditor	25238	55.82	49.66	0	100
Website	25508	54.02	49.84	0	100
E-mail	25544	85.82	34.88	0	100

3.5. Methods

To evaluate the determinants of whether formal enterprises witness informal sector competition across the Latin American & Caribbean countries, probit estimate techniques are employed. To test the four hypotheses H1-H4, the probit equation used here is:

$$I_i = \alpha_0 + \beta_0 H + \mathbf{X}_i \boldsymbol{\beta}_i + \varepsilon_i$$

where I_i represents whether formal enterprises state that they witness informal sector competition, α_0 denotes the constant term, H represents the variables in terms of different hypotheses H1-H4, \mathbf{X}_i denotes a vector of exogenous variables capturing firm-level characteristics and, the error term ε_i is normally distributed with zero mean and constant variance.

4. Findings: Explaining Cross-Country Variations in Informal Sector Competition

The finding is that 65.5 per cent of the formal enterprises surveyed in these Latin American & Caribbean countries report that they witness informal sector competition. And the extent varies from different countries. Table 3 provides an analysis of the varying extent to which formal sector enterprises witness informal sector competition across these 31 Latin American & Caribbean countries. This reveals that the proportion of formal enterprises reporting that they witness informal sector competition ranges from 86 per cent in Suriname and 82 per cent in Bolivia to 11 per cent in Dominica and 23 per cent in St Lucia.

Table 3. Cross-national variations in the prevalence of informal sector competition

Country	Percentage	Country	Percentage
Suriname	86	Jamaica	65
Bolivia	82	Ecuador	65
Antigua & Barbuda	77	Belize	64
Uruguay	75	Mexico	64
Paraguay	75	St Kitts and Nevis	62
Costa Rica	73	Honduras	61
Dominican Republic	73	Guyana	60
Grenada	73	St Vincent & the Grenadines	59
Colombia	72	Bahamas	56
Peru	72	Barbados	53
Guatemala	71	Panama	52
Argentina	69	Chile	51
El Salvador	69	Venezuela	36
Trinidad & Tobago	67	St Lucia	23
Nicaragua	66	Dominica	11
Brazil	66	Average	66

How, therefore, can such marked cross-country variations be explained? Is it the case as the modernization thesis suggests that cross-country variations are associated with the level of economic development, or is the case that these cross-country variations are associated with too much or too little state intervention as the neo-liberal and political economy theories respectively assert? Or alternatively is it the case that cross-country variations are associated with the differing degrees of asymmetry between formal and informal institutions across countries?

Table 4 below evaluates the likelihood of a formal enterprise stating that it witnesses informal sector competition across the Latin American and Caribbean countries. Model 1 reports the basic probit coefficient estimates of the probability of a formal enterprise witnessing informal sector competition using only the firm-level variables. This reveals that the effect of firm age is significant and positive, with older firms being more likely to witness informal sector competition than younger firms. Meanwhile, formal enterprises that are export-oriented and foreign-owned are significantly less likely to witness informal sector competition than non-exporting and domestic-owned enterprises. This is doubtless because the former is more likely to operate in relatively different market segments to informal sector enterprises. Examining workforce characteristics, if the top manager has greater experience of working in the sector, this is positively and significantly associated with informal sector competition, perhaps indicating that they are in a relatively advantageous position of detecting and dealing with such competition. Enterprises more

likely to employ permanent full-time and female workers, furthermore, are more likely to witness informal sector competition, as are enterprises where women are involved in the ownership of the formal enterprise. Analyzing technology, formal enterprises with quality certification are less likely to witness informal sector competition. Akin to other studies (Galiani and Weinschelbaum, 2012; Kanbur, 2015), firm size is negatively associated with the likelihood of witnessing informal sector competition. The operations of small firms are more likely to be constrained by informal sector competitors than medium- and larger-sized enterprises. Finally, with respect to the legal status of firms, no association is identified with whether enterprises witness informal sector competition.

Table 4 Probit model of informal sector competition, Latin American & Caribbean

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Ln (GDP per capita)		-0.168*** (0.030)				
Household consumption expenditure per capita			-0.195*** (0.029)			
Tax revenue to GDP ratio				-0.034*** (0.003)		
Expense of government as a percentage of GDP					-0.012*** (0.002)	
Corruption						0.439*** (0.140)
Trust	-0.209*** (0.027)	-0.179*** (0.028)	-0.194*** (0.028)	-0.145*** (0.032)	-0.195*** (0.027)	-0.197*** (0.029)
Firm characteristics						
Firm age	0.003*** (0.000)	0.003*** (0.000)	0.003*** (0.000)	0.003*** (0.000)	0.003*** (0.000)	0.003*** (0.000)
Exporter	-0.003*** (0.000)	-0.003*** (0.000)	-0.003*** (0.000)	-0.004*** (0.000)	-0.003*** (0.000)	-0.003*** (0.000)
Foreign ownership	-0.003*** (0.000)	-0.003*** (0.000)	-0.003*** (0.000)	-0.003*** (0.000)	-0.003*** (0.000)	-0.003*** (0.000)
Workforce						
Top manager experience	0.004*** (0.001)	0.004*** (0.001)	0.001 (0.001)	0.002* (0.001)	0.003*** (0.001)	0.003*** (0.001)
Temporary worker	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)
Permanent full-time worker	0.000* (0.000)	0.000*** (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000* (0.000)	0.000 (0.000)
Female full-time worker	0.003*** (0.000)	0.000 (0.000)	0.003*** (0.000)	0.003*** (0.000)	0.003*** (0.000)	0.000*** (0.000)
Female ownership share	0.000 (0.000)	0.000** (0.000)	0.000** (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Technology						
Quality certification	-0.003*** (0.000)	-0.003*** (0.000)	-0.004*** (0.000)	-0.002*** (0.000)	-0.003*** (0.000)	-0.001*** (0.000)
External auditor	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
Website	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)
E-mail	0.000	0.001	0.001	0.000	0.001	0.000

	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Firm size						
Medium	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000* (0.018)	-0.000 (0.000)	-0.000 (0.013)
Large	-0.001*** (0.000)	-0.002*** (0.000)	-0.001*** (0.000)	-0.002*** (0.000)	-0.002*** (0.000)	-0.002*** (0.000)
Legal status						
Closed shareholding	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Sole proprietor	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Partnership	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Limited partnership	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Other legal status	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.00 (0.045)
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.298*** (0.070)	1.817*** (0.285)	1.856*** (0.239)	0.878*** (0.106)	0.579*** (0.086)	0.235*** (0.077)
Pseudo R-squared	0.04	0.04	0.04	0.05	0.04	0.04
N	11,790	11,790	8,966	8,305	11,790	11,031

Source: authors' calculations from World Bank Enterprise Survey (WBES) dataset

The remaining models then add the key country-level variables to these firm-level variables in a staged manner to examine their influence. To evaluate the validity of modernization theory, model 2 adds the country-level indicator of the log of GDP per capita and shows a significant negative association. The higher the log of GDP per capita, the lower is the probability that formal enterprises will witness informal sector competition (confirming H1a). Similarly, model 3 evaluates log of household consumption expenditure per capita and finds that the higher is the household consumption expenditure per capita, the lower is the probability of formal enterprises witnessing informal sector competition (confirming H1b). These two models therefore confirm the modernization thesis (H1). Importantly, moreover, the significances and signs of all the firm-level variables in model 1 remain the same when these country-level variables are added in models 2 and 3. This also applies in the case of all remaining models that add country-level variables associated with the remaining theoretical explanations.

Testing the neo-liberal thesis (H2) and political economy thesis (H3) that the operations of formal enterprises are more likely to witness informal sector competition when there is too much or too little state intervention respectively, model 4 examines tax revenue to GDP ratio and model 5 the expense of government as a percentage of GDP. The finding in model 4 is that there is a negative association between tax revenue to GDP ratio and the likelihood of formal enterprises witnessing informal sector competition (refuting H2a but confirming H3a). Model 5 similarly finds a negative association between the expense of government as a percentage of GDP and the likelihood of formal enterprises witnessing informal sector competition (refuting H2b but confirming H3b). The outcome is that an association

between too little state intervention and the probability for formal enterprises witnessing informal sector competitors in Latin American and Caribbean countries (refuting H2 but confirming H3).

Meanwhile, as a test of whether formal enterprises are more likely to witness informal sector competition when there is asymmetry between the laws and regulations of formal institutions and the norms, values and beliefs of entrepreneurs, all models examine the level of trust of entrepreneurs in institutions, measured by whether they perceive the court system as fair, impartial and uncorrupted. There is strong significant negative association between trust in formal institutions (measured by whether the court system is viewed as fair, impartial and uncorrupted) and the likelihood of formal enterprises witnessing informal sector competition; the lower the trust in formal institutions, the greater is the probability that formal enterprises will witness informal sector competition (confirming H4a). It is similarly the case that when corruption is taken as a further proxy indicator of the existence of vertical trust (i.e., symmetry between the formal and informal institutions), model 6 again reveals a significant correlation between corruption and the likelihood of formal enterprises witnessing informal sector competition. The greater the likelihood of an entrepreneur asserting that an informal gift or payment is expected or requested to get things done, the greater is the likelihood of a formal enterprise asserting that they witness informal sector competition (confirming H4b). The outcome is that there is a significant correlation between institutional asymmetry and the likelihood of informal sector competition (confirming H4).

5. Discussion and Conclusions

Evaluating WBES data collected in 31 Latin American & Caribbean countries between 2006 and 2010, the finding is that two-thirds (65.5 per cent) of formal enterprises state that they witness informal sector competition. To explain these cross-country variations, a probit regression analysis has revealed that beyond economic under-development, it is too little state intervention that leads to greater informal sector competition and the non-alignment of the laws and regulations with the norms, values and beliefs of entrepreneurs. Here, therefore, the theoretical and policy implications are discussed. (our findings confirm three views, so discussion parts should be rewrite.)

Theoretically, this reveals the need to transcend the use of singular theories when explaining variations in the commonality of informal sector competition. These theories are not mutually exclusive. Instead, if cross-country variations in the prevalence of informal sector competition are to be more fully understood, there is a need to combine the modernization, political economy theory and institutional theories. The propensity of formal enterprises to witness informal sector competitors is greater in countries where there is a lower level of economic development, too little government intervention and the level of institutional asymmetry is higher.

This finding has implications for how the informal sector is tackled. Conventionally, the dominant policy approach of governments has been for the enforcement bodies, such as the tax and labour enforcement authorities, to ensure that the cost of being caught and punished is greater than the pay-off from participating in the informal sector (Allingham and Sandmo, 1972). This has been achieved largely by using “sticks” which increase the costs and likelihood of being caught by increasing the fines and/or perceived or actual probability of detection. Recently, furthermore, more attention has been paid to altering the cost/benefit ratio by improving the benefits of formalisation using “carrots” (incentives) to encourage formal sector entrepreneurship (Matthias et al., 2014).

As this paper displays, nevertheless, when tax and labour enforcement authorities alter the costs of informality and the benefits of formalisation, they are merely dealing with the effects of the problem. They are not tackling the structural economic and social conditions that determine the level of informal sector competition. Formal enterprises will be less constrained by informal sector competition only if there is a higher level of economic development, more state intervention and greater symmetry between the laws and regulations introduced by formal institutions and the norms, values and beliefs of entrepreneurs. The latter can be addressed by changing the norms, values and beliefs of entrepreneurs using education and awareness raising initiatives about the benefits of formality and disadvantages of informality. However, in many countries, it is unlikely that these informal institutions will change unless there are alterations in the formal institutions. This requires firstly, greater procedural fairness so that entrepreneurs believe they are paying their fair share compared with others (Molero and Pujol, 2012), secondly, greater procedural justice, in order that entrepreneurs believe they are being treated by the authorities in a responsible, respectful and impartial way (Murphy, 2005) and third and finally, greater redistributive justice in order that entrepreneurs perceive themselves to be receiving the goods and services they deserve for the taxes they pay (Kirchgässner, 2010).

Despite revealing some strong associations between the level of informal sector competition and various structural conditions, limitations nevertheless exist in relation to what can be concluded, and caveats are required. A first limitation of this study is that informal sector enterprise and entrepreneurship has been examined only through the lens of whether formal enterprises witness informal sector competition. The problem is that this cross-country enterprise survey has not defined for respondents what is meant by informal sector competition. Respondents may thus interpret registration in multifarious ways (e.g., whether an enterprise is registered under factories’ or commercial acts, whether it possesses a local trading license, whether it is registered under professional groups’ regulatory acts), especially across sectors, and across different countries. Secondly, this WBES survey only evaluates the prevalence of informal sector competition through the lens of formal enterprises employing five or more employees. It does not ask micro-enterprises and sole traders whether they are constrained by informal sector competition. Given that this paper reveals that smaller enterprises are more likely to witness informal sector competition, the levels of informal sector competition reported may be an under-estimate. Future cross-country surveys, therefore, should survey micro-enterprises and sole traders.

To conclude, despite these shortcomings, this paper has made theoretical advances in explaining informal sector entrepreneurship by revealing that it is not only too little state intervention, as political economy theory argues, but also whether the laws and regulations introduced are in symmetry with the norms, values and beliefs of entrepreneurs, as institutional theory asserts, along with the level of economic development, as modernization theory contends, that influences the level of informal sector competition. If this now leads to governments paying greater attention to these structural determinants when tackling informal sector competition, rather than simply using “sticks” and “carrots” to deal with the effects, then this paper will have fulfilled its intention.

6. References

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