Exploring Informality: An Empirical Analysis of the Informal Economy

Sadie Gardner

College of William and Mary

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Exploring Informality: An Empirical Analysis of the Informal Economy

A thesis submitted in partial fulfillment of the requirement for the degree of Bachelors of Arts in International Relations from The College of William and Mary

by

Sadie Gardner

Accepted for High Honors

Professor T.J. Cheng, Director

Professor Rani Mullen

Professor Berhanu Abegaz

Williamsburg, VA
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Sadie Gardner

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Thank you.
Part I

Introduction: The Importance of Informality
Consider, for a moment, the difficulty faced by the owner of a small tailoring shop in Cusco, Peru. The high level of competition forces her to lower prices every week in order to attract new customers. Unfortunately, the costs of running a business are not decreasing. Filing taxes is a long and arduous process,\(^1\) while a complicated regulatory structure serves to further increase the costs of conducting business (Heritage Foundation, 2008; World Bank Group, 2008). After a few months of low profits, this business owner makes the difficult decision to enter the informal sector, going through the lengthy process of closing her business. She is officially unemployed, but loyal customers know where to find her. She is able to continue production without the nuisance of taxes or regulation. With this change, the Peruvian tailor has entered the informal sector. According to a typology discussed in further detail later, these actions place the Peruvian tailor in the category of *evasive informal activity*. By leaving the formal economy as a response to high taxes and regulatory burdens her actions clear.

In contrast, consider a Peruvian tailor who is unsure of her ability to attract enough customers and remain solvent. She starts out by doing work for family and friends, relying on word of mouth to bring in new business. After building a sufficient customer base, she makes the leap to formal business, registering with the government and beginning to pay taxes on her earnings. This individual has

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\(^1\) The World Bank estimates that a medium business spends an average of four hundred and twenty four hours annually complying with tax regulations. This is one hundred hours more than the time for United States businesses of the same size (Heritage Foundation, 2008).
made the opposite transition, using the informal sector as a launching ground for a formal business and placing herself in the start-up category of informal activity.\(^2\)

From these two simple examples it is obvious that the informal economy is comprised of multiple individuals performing a variety of activities, a problem which has plagued previous research of the sector. This observation asks researchers to consider whether informality poses a problem large enough to matter and, if so, in what ways it affects an individual country’s economy.

In over eighty countries worldwide, the informal economy comprises at least one third of the official GDP (Schneider, 2007). The implications of these numbers are even more staggering considering that this large portion of the GDP is, by definition, not taxed or regulated by the country’s government. The resultant loss in potential tax revenue is huge, especially for developing countries whose governments are already strained to provide basic services.\(^3\) In addition to the economic impact, informal activity is associated with risky operating procedures as these businesses avoid most all types of government regulation, including health standards for workers, and tend to engage in environmentally irresponsible behavior for which those in charge are generally not held

\(^2\) This anecdote is based on interviews conducted of small business owner is Cusco, Peru during the summer of 2007. Though these stories do not mirror that of any specific individual, they reflect the general sentiments and situation of many.

\(^3\) This paper is by no means suggesting that formalizing the informal economy will lead to a more effective government. As is widely documented in the literature, corruption, distorted incentives, and many other problems face the governments of developing countries, all of which are problems that increased revenue will not alter (Easterly, 2001; van de Walle, 2001).
accountable (Forastieri, 1999). For an activity of such significance to so many countries, surprisingly little is known about the root causes and long-term effects of the informal sector. Though typical explanations of informality (high taxes, over-regulation, and high levels of corruption) tend to suggest that those participating in the sector choose to hide their activities from the state for the sake of convenience, an increasing number of studies suggest otherwise (Bajada & Schneider, 2005b; Dreher & Schneider, 2006; Williams & Round, 2007; Ypeij, 2000).

While the issue of informality is particularly salient to developing nations as they tend to have much larger informal sectors than their developed counterparts, that it is also of concern to many developed nations demonstrates the truly global nature of this dilemma (Bajada & Schneider, 2005b). The problems associated with informality are well documented. The issue of lower tax revenue is intuitive, but there are other concerns to be addressed. As informal businesses and their employees are often not included in the calculation of national statistics used to gauge the health of a country’s economy, a large amount of informal activity can result in highly biased statistics. For example, individuals

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4 Though there is a debate as to whether or not the term informal sector should be used (see KILM, 2007), this paper will utilize the terms informal economy and informal sector interchangeably. This practice is commonly accepted by many scholars (Rakowski, 1994b). Other academics have proposed that the terms underground economy, shadow economy, black economy, parallel economy, invisible economy, and others may also be used (Humphreys, 1985; Schneider & Enste, 2002).
working in the informal economy may be included in the estimates of a country’s unemployment rate (Bajada & Schneider, 2005a; Hyun & Yoo, 1999; Tanzi, 1999). These distortions have become a particular concern in the European Union as the community seeks to expand membership to nations with particularly large informal sectors, biasing the very statistics used to judge their candidacy (Enste, 2005; Tanzi, 1999). Finally, as informal economic activities do not comply with regulations, there is a high probability that many of the goods produced and services provided by this sector will not comply with acceptable health and safety standards, leading to additional problems for the government to address (Bajada & Schneider, 2005a).

However, the effects of informality are not all bad. Recent studies suggest that this sector may have a positive effect on a country’s growth rates or even help to reduce poverty (Kim, 2005; Ypeij, 2000). As the informal economy often employs those who are relatively poor within a given society, it has been suggested that this sector acts as a de facto manner of redistributing income, since individuals who are formally employed are, via taxes, paying for the public goods provided by the country’s government (Ypeij, 2000). A 2005 study even found that, in relatively impoverished areas, participation in the informal economy is linked with increased community engagement, an activity that most governments want to encourage (Williams, 2005b). The competing effects of informal activity make the adoption of effective policies even more difficult. Should governments
work to fight the informal sector or support it? These issues combined with the many other problems faced by developing nations as they confront periods of stalled growth have confirmed that further exploration of the concept must be an essential component of future development plans (Bajada & Schneider, 2005b; Loayza, 1996). In order to fully comprehend how the informal economy is affected by different policies, a better understanding of its root causes is necessary. Beyond the typical explanations of taxes, regulations, and corruption, what factors lead to high levels of informal economic activity? How does this activity affect other aspects of a country’s development, specifically economic growth?

In the following introduction I will discuss which definition of the informal economy is used in this work, give a basic outline of past thought on the field, and provide a brief summary of the theoretical grounding, describing the expected relationships between tested variables. A brief description of the tests conducted will be followed by the results of these tests and a short outline of the paper’s layout.

What is the Informal Economy?

Though there is a wide variety of literature dedicated to understanding the informal economy, a universally accepted definition for the concept has yet to emerge. The informal economy has been defined based on many different criteria. Some researchers focus on the number of, or relationship between, people involved in an individual business, while others maintain that it is the
relative size of the business, or its relationship with other entities – such as large corporations or the government – that identify informal businesses (International Labour Organization, 2002; Roberts, 1990; Ypeij, 2000; Schneider, 2007). In short, the informal economy can refer to a wide range of activities that produce a myriad of products. The International Labor Organization (ILO) attempted to remedy this problem in 1993 by establishing an official definition for the term. However, this definition was not adopted on a universal level, and the problem remains as individual states continue to define the concept and calculate measures in slightly different ways (International Labour Organization, 1993; KILM, 2007).

Given this confusion, it is essential to state the exact definition to be used in any study of informality. This paper will follow the example set by Friedrich Schneider, defining the informal economy to include those businesses which conceal their activity from the government and other regulatory agencies, despite the fact that the goods and services they produce are perfectly legal. In other words, those goods which would be included in a country’s GDP statistics and taxed were they reported to the proper authorities. This definition purposefully excludes all criminal activity that is occasionally classified as informal, as well as unreported profits that do not relate to the production of goods and services (F. Schneider & Enste, 2002; F. Schneider & Bajada, 2005; F. Schneider, 2007). Excluding criminal activity is essential as its inclusion adds a new dimension to research on the topic which is counterproductive to the goals of this particular
study. With a focus on those businesses whose informality is affecting the
government via reduced tax base and distorting national statistics, the inclusion of
criminal activity would be ineffective as these activities would not be included in
GDP calculations if they were discovered by authorities.

**Concept of the Informal Economy Emerges**

An understanding of how the concept and theories of the informal
economy evolved allows for easier comprehension of the debate. In the 1950’s
and 1960’s, many described what is now referred to as the informal economy (the
term had yet to be coined) as backward and detrimental to a country’s
development. Often dubbed the “traditional” sector, small-scale economic
activity, such as shoe shining or selling goods on the street, was seen as the
temporary response to a shortage of job opportunities brought on by mass urban
migration and high rates of population growth, a problem that could easily be
resolved with foreign investment and the development of a “modern” industrial
sector (International Labour Organization, 1972; International Labour
Organization, 2002; Moser, 1994). However, this perception of informality came
under question as researchers began to conduct increasingly in-depth studies. For
example, an ILO report during this period called for the creation of five million
new jobs in Colombia so as to rid the country of its “traditional” economy. The
impractical nature of this recommendation caused many to question portrayals of
the informal economy as a simple nuisance left over from those areas of society
that had yet to accept capitalism (International Labour Organization, 2002; Moser, 1994). Though supporters of the traditional/modern view continued to push economic modernization, many scholars began to look for new explanations (International Labour Organization, 2002).

In the late sixties, Keith Hart coined the term “informality” in an innovative study which presented this sector of the economy as relevant and possibly necessary to a country’s development (Hart, 1973; International Labour Organization, 2002). In his analysis of Ghanaian informality, Hart equated the concept with being self-employed. He went on to describe the important role played by this activity in providing an income for people between jobs, focusing on case studies of citizens who switched back-and-forth between formal and informal employment. Suggesting that this sector of the economy could be viewed either as an impediment to growth, trapping people in a cycle of poverty, or a precursor to growth, providing entrepreneurs the opportunity to launch a successful business, Hart noted that more research needed to be done in order to discern the sector’s full effects (Hart, 1973). Much of the research conducted since Hart published his study attempts to classify the informal economy’s effect on a country’s development.

The ILO followed Hart’s study of Ghana with one in Kenya, designed to better understand that country’s high unemployment figures. This research on unemployment focused on the dichotomy between formal and informal
enterprises, concluding the Kenyan government needed to encourage more informal-type employment instead of restricting it. This, they argued, would produce reductions in the unemployment rate. The ILO researchers looked at individuals in several different types of informal jobs, from construction workers to female laborers, addressing the problem from multiple angles (Leys, 1973). Though this study produced several recommendations which have since been condemned as unrealistic, its contribution to the conception of informal activity has helped in expanding the definition to include individuals employed in multiple sectors (Leys, 1973). In addition to broadening the concept of informality, the ILO supported Hart’s conjectures that the informal economy was not necessarily a hindrance to development, an idea which, controversial at the time, has since become a common approach to the study of informality (International Labour Organization, 2002).

In the late eighties Peruvian economist Hernando De Soto, along with the Institute for Liberty and Democracy (ILD), pushed the concept of informality further in an in-depth case study of the sector in Lima, Peru. This book described informality as the rational response of Peru’s poor population given the country’s internal instability and high number of regulations for businesses to enter the market legally (Bromley, 1994). De Soto emphasized the importance of the informal economy in the country’s day-to-day functioning, from providing public transportation to building houses. He portrayed the Peruvian state as the main
problem, claiming that overregulation is the true source of informality. To back this claim, De Soto tracked how long it would take for a small business to formalize in Peru. His findings were astounding. Nearly three hundred days at an extraordinarily high cost, the equivalent of nearly three years minimum wage earnings, was required to start a small business (De Soto, 1989). De Soto’s study directed attention to the role that individual states play in influencing the size of the informal economy within their borders, and led the Peruvian government to enact several policies to reduce these barriers (Bromley, 1994).

Throughout the end of the 20th and into the 21st century, studies of the informal economy expanded to regularly include the developed as well as developing nations. Much of this research has been particularly focused on European nations since entrance into the European Union has made computation of accurate statistics, something a large informal economy obscures, essential (Tanzi, 1999). The resulting research, often in-depth case studies, tends to focus on the incentive structures within individual nations and proposes policy options aimed at reducing the size of the informal sector (Debrah, 2007; Williams, 2005a; Williams & Round, 2007; Ypeij, 2000). In addition to studies of individual nations, researchers are beginning to focus on large-scale data collection in an attempt to correlate the informal economy with other variables and to test previous theories that government regulation is at the heart of the informal activity. A few studies have begun to include other variables traditionally
associated with informality, such as corruption levels within a country (Dreher & Schneider, 2006; Schneider, 2007).

Theoretical Grounding

The above-mentioned views each served an important role in conceptualizing the informal economy, identifying the practice, and connecting it to a country’s economic development. As discussed in greater detail throughout the following section, the legalist perspective (based in the neo-liberal school of thought) combined with rational actor theory is utilized as a framework for this study. Together these two views form rational legalist theory, which is discussed below and displayed in Figure 1.1.

Legalist theory views informality as an entrepreneur’s logical response to over-regulation by the state (Rakowski, 1994a). Hernando De Soto’s research, in which he explored the vast bureaucratic system that Peruvian businesses had to navigate in order to formalize, is an early contributor to this school of thought (De Soto, 1989). But legalist theory leaves many things to be explained. It fails to consider that the costs entrepreneurs seek to avoid are not just monetary but include social, as well as opportunity, costs. Relying on the rational actor theory allows for the inclusion of these additional costs.\(^5\) The rational legalist model argues that entrepreneurs consider all costs involved in entering the formal sector

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\(^5\) Rational actor theory states that before making any decision, rational actors will take into account every cost and benefit associated with that decision eventually choosing that option which provides them with the highest level of utility (Kraft & Furlong, 2007).
before deciding to undergo the process. As this includes the social and opportunity costs of formalizing, the main causes of the informal economy can no longer be restricted to the amount of taxes levied, regulations enforced, and corruption within a country. Factors such as gender equality and education should also be considered and are expected to have negative relationships with the size of the informal economy. Other variables, such as the amount of goods a country exports, are also expected to influence the individual’s decision and are predicted to have a positive relationship with informality. This first stage of the rational legalist model is displayed as the first half of Figure 1.1 below.

The next step in the rational legalist model predicts the effect that informal activity will have on the economy’s overall growth. The legalist view anticipates that removing the barriers which force businesses to evade government regulation will allow those in the informal sector to formalize and propel the country’s economic growth. By not removing these barriers, growth is predicted to be stifled due to the lack of taxes collected and income reported (Rakowski, 1994a; Ypeij, 1998). This portion of legalist theory is carried over to the rational legalist model, which anticipates that economic policies conducive to formalization will increase the amount of start-up informal activity and lead to economic growth, while restrictive policies will increase evasive activity, stalling economic growth.
Since rational choice theory is used as a base for rational legalist theory, there are a multitude of independent variables which could be included in this analysis. The researcher need only provide strong theoretical support for why individuals would consider the factor relevant when deciding to enter the informal sector. For this reason, the rational legalist model will always be open for further interpretation as new information surfaces about the sector. With the assumption that individuals are rational actors, this study is able to include additional variables, aimed at measuring such factors as gender equality and education, alongside traditional explanations of informality. These measures for gender equity, education, and government quality are all expected to have negative relationships with the informal economy while measures of taxes, regulations,
corruption, exports and a poor age distribution within the population are all expected to have positive relationships with informality.

The predicted relationships are tested using ordinary least squares regression techniques and first-differenced data from one hundred and twenty four countries in the years 2000 and 2005. The exact specifications of this model are elaborated on in Part III. Using the first differences model to correlate the changes in informal activity with changes in the predicted variable will provide a better idea of why the informal economy grows, helping to better understand the level of informality within a given country. The second half of rational choice theory predicts that different types of informality affect a country’s growth in different ways. This is tested by dividing countries into two groups – those with a conducive business environment and those with a restrictive environment. After this division has been made, the relationship between the size of the country’s informal economy and its economic growth is tested. This relationship is expected to be positive in countries with conducive policies and negative to non-existent in countries with restrictive policies.

The results of these tests, though occasionally surprising, tend to support the rational legalist model. The measures of gender inequality and age distribution are both significant. The measure used to approximate gender equality, female labor force participation rates, has the predicted positive relationship with the informal economy, while the country’s dependency ratios,
used to approximate age distribution, have a relationship exactly opposite that which was expected. All else equal, a country with relatively more individuals of working age will have a larger informal economy. Measures of education and government quality are on the borderline of significance, with both variables displaying relationships opposite those predicted. Exports are found to be insignificant to a country’s informal economy. Many factors considered key in legalist theory were found to be insignificant, such as the measures used to quantify tax burden, regulations, and corruption. Given the literature supporting this relationship, these findings are likely a product of another issue; possibilities for this are discussed in Part IV.

The second set of tests is much more supportive of the rational legalist model, finding that the relationship is as predicted. Countries with conducive policies have informal economies which have a high, positive correlation with growth, indicating that a larger informal economy is correlated with higher growth in these countries. However, countries with restrictive policies have a very weak correlation between the informal economy and economic growth. While this is not the negative relationship expected, it does indicate that there is a difference between these two types of formality, which is the ultimate goal of rational legalist theory.

This study takes previous research one step further. Though case studies often delve into the relationship between certain social indicators and
demographic factors within a given country, there has yet to be a large-scale comparison of these relationships across numerous countries, especially one that accounts for states at varied levels of development. This research also provides a coherent logic for expecting a different relationship between a country’s informal economy and growth based on a set of factors other than its GDP.

The following chapter will explain the theoretical assumptions behind this study, discussing the definitional problems which have plagued studies of informality and justifying the need to adopt the rational legalist approach. The third section identifies those variables identified as causes to the informal economy, addressing past research to support the assumptions made. The measurements used to quantify these variables are also addressed, as is the fundamental problem of measuring a variable which, by its very definition, is something its participants try to hide. The fourth and fifth sections provide an in-depth analysis of the results mentioned previously, while the final chapter puts these findings in context with the big picture, addressing why this information is important and how it can be used in future research.
Part II

Theory: Finding a Paradigm
The following section provides an in-depth discussion of the theoretical grounding for this study. The many conceptualizations of the informal economy mentioned in the introduction are described here in greater detail along with a detailed description of the specific definition to be utilized throughout this analysis. The main theoretical frameworks dealing with informality are outlined, and a mix of the legalist perspective and rational choice theory is chosen as a guide. A brief summary of past studies that have examined the informal economy provides support for the selection of these theories, followed by a detailed description of the model used in this study, rational legalist theory.

As previously mentioned, there is no universal conception of the informal economy. Though the International Labor Organization (ILO) officially defined the term in 1993 during the 15th International Conference of Labour Statisticians, there has yet to be a widespread adoption of this definition. Taking into account various facets of the concept, this conference declared the informal economy as those “units engaged in the production of goods or services with the primary objective of generating employment and income…. [They] typically operate at a low level of organization with little or no division between labor and capital…and on a small scale” (International Labour Organization, 1993, p.2). A tendency to rely on “social relations rather than contractual arrangements” as well as to have the unit’s owner assume full liability for the business are other characteristics used to
identify those operating in the informal economy (International Labour Organization, 1993, p.2). For example, street vendors are a common type of informal business. Street vendors are often self-employed and tend to rely on the profits of their day-to-day activity for survival. The lack of a formal place to conduct business highlights both the small-scale nature of the work, as well as the difficulty inherent in capital acquisition. Finally, street vendors tend to conduct business transactions, such as buying materials for their goods, from family or friends and their businesses are not legally established, so the individual remains liable for any problems that may arise. Unfortunately, many nations never adopted this definition for their own purposes and continue to calculate statistics based on varied criteria. This makes efforts to compile a universally comparable and valid dataset exceedingly difficult (KILM, 2007). Furthermore, the multiple debates among scholars concerning exactly what constitutes the informal economy ensure that the emergence of a universal definition is unlikely.

Developing a complete understanding of the scope of the informal economy requires knowing what the concept does not include. Defining the informal economy through purely descriptive terms has been a practice used by many in order to conceptualize the term. In this approach, many researchers focus on characteristics of the formal economy, claiming that entities with the opposite characteristics comprise the informal economy. For example, businesses within the formal sector are viewed as providing stable employment while making
profits; therefore, those businesses providing irregular employment and making little to no profit are classified as informal. Another common practice is to directly label those individuals below a certain income level or businesses smaller than a given size as members of the informal economy (PREALC, 1978, p. 22-3; Ypeij, 2000). However, relying on a descriptive method to classify economic activity is problematic from a methodological standpoint as one could easily run into problems of classification. For example, how does one determine the number of characteristics an activity would need to demonstrate before being classified as formal? With this in mind, it is obvious that the informal economy needs its own definition rather than one which simply defines it as the opposite of another vaguely defined concept. While this is an intuitive way to conceptualize the informal economy, its problems outweigh any benefits the additional clarity provides (Bromley, 1994; Sindzingre, 2006; Ypeij, 2000).

Since defining a concept solely by what it is not can be problematic, many researchers rely on a business’s relationship with the government to determine whether it is formal or informal. This manner of classification is not only more straightforward than others, it is often easier to measure than those conceptualizations previously discussed. To define the informal sector, Schneider and Enste (2002) divide the economy into two separate entities: legal and illegal. The legal sector consists of both transactions accounted for by the GDP and those things the GDP does not account for by design, referred to as the “self-sufficient
economy.” The illegal sector includes both the criminal and informal economies. The criminal economy consists of trade in illegal goods, such as drugs and stolen items, while the informal economy consists of trade in legal goods that are produced or sold in an illegal manner, such as not paying the correct taxes or noncompliance with industry regulations. Finally, by definition, all transactions that take place in the informal economy are not included in a country’s reported GDP calculations but would be if they were properly reported to the government. While this definition of the informal economy is easy to comprehend, it is also exceedingly difficult to measure, a problem extensively addressed later in this paper (De Soto, 1989; Loayza, 1996; Schneider & Enste, 2002).

Many researchers are critical of these methods of conceptualization, as they tend to produce a dualistic model, a view that there are two sectors – the formal economy and informal economy – with no room in between (Chen, 2006; Murphy, 1990; Ypeij, 2000). These scholars argue that the concept of informality is not dichotomous but continuous. They stress the various characteristics associated with being informal (such as scale of production or relationship with the government) and note that a business can contain numerous combinations of these characteristics but not all of them. These factors, they argue, indicate the gradations of informality within an economy and require researchers to use a different approach when discussing the subject (Murphy, 1990; Ypeij, 2000). It is also important to recognize the wide variety of economic activities that get
grouped together in the two sector approach. Murphy (1990) argues that the concept cannot be effectively studied with a dualistic approach due to this problem. He notes that, in some studies, authors have classified both street vendors and professionals who work without reporting their hours as informal, stating that these two activities are so inherently different they cannot be studied as if they were the same. According to Murphy, this manner of conceptualizing the informal economy implies a solution (reduce state involvement in regulating businesses) that is overly simplistic. (Murphy, 1990). While the continuum of informality concept is undoubtedly useful, it is highly difficult to implement.

As previously established, this study will adopt the definition of informal economy used by Friedrich Schneider. The informal economy consists of “all market-based legal production of goods and services that are deliberately concealed from public authorities” (Schneider, 2007, p. 4). This term can refer to everything from avoiding payments of income taxes or social insurance payments to ignoring minimum wage requirements or not completing requisite government forms. However, it specifically excludes any purposefully illegal activities, such as selling drugs (Schneider, 2007). While this definition does exclude certain aspects of the economy that many would label informal, such as the criminal sector, it is best-suited for the type of analysis which follows. The focus of this study is on those businesses which, if registered with the government, would be
supplying perfectly legal goods and services that would be calculated in with the GDP and other national statistics.

The selected definition is not perfect, a common criticism being that it produces a dualistic perception of the economy (Chen, 2006). While that is an important concern to address, it is most important in the implementation of a successful case study involving discussions of the social repercussions of the varied levels of economic activity. The compilation of a dataset with that range of depth is simply not practical on a large scale. The following project focuses on identifying underlying reasons entities avoid government regulation or taxation in the first place and goes on to discuss how this avoidance affects the country’s economy. While a nuanced understanding of those entities comprising the informal economy is essential to interpreting the results and discussing them on a country-by-country basis, gathering that depth of information for every country is not necessary or realistic for a study of this nature.

**Competing Theories**

As discussed in the introduction, the seminal Hart study of the late nineteen sixties provided a new and much-needed approach to studying the informal economy. Hart’s in-depth case study of the economic situation in Ghana suggested two different ways in which to view informality, a precursor to economic growth or an impediment to the process. Hart discussed the possibility

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6 Ypeij (2000) and Murphy (1990) – detractors of any dualistic division of the economy – conduct case studies in Peru and the Dominican Republic, respectively.
that the informal economy could lead to a cycle known as a vicious circle –
trapping informal employees in a cycle of poverty. The exceedingly low wages
that often characterize informal jobs provide initial justification for this view.
However, Hart is quick to point out that the informal economy may also provide
aspiring business owners with the perfect opportunity to launch a business which
would eventually be formalized. He cites the flexibility inherent in informality as
reason to believe that business owners are much more likely to begin here than in
the formal sector due to the lower costs of failure (Hart, 1973). Since the
publication of this study, much of the research conducted attempts to classify the
relationship between the informal economy and development (Perry et al., 2007).
The two options proposed initially by Hart characterize the two theoretical camps
that have since emerged to classify the nature of informality, structuralist and
legalist.

Structuralist theory of informality is grounded in the class-based
assumptions of neo-Marxist economic theories (Chen, 2006; Rakowski, 1994a).
According to Marxism, rich capitalists exploit the poor in order to advance their
personal well-being, both within and between states (Moser, 1994; Oatley, 2006).
Structuralists view the informal economy as a mechanism through which the rich
are able to exploit the poor within individual countries, as shown in Figure 2.1.
They maintain that informality emerged as a result of the marginalization inherent
in operating under a capitalist system and study the relationships that exist
(generally described in terms of dominance and subordination) between large and small scale enterprises to support their theories. This view of the informal economy is also described as petty commodity production, a term referring to the small size of informal activities relative to their formal counterparts (Moser, 1994; Murphy, 1990; Ypeij, 2000). Researchers of the structuralist school tend to study the relationships between big firms and the smaller ones to whom they subcontract work, often at sporadic intervals for extremely low prices. These studies note the essential role that smaller producers play in allowing large firms to generate profits, providing low-cost inputs which allow larger firms to extract higher revenues. They are careful to mention how dependent the smaller producers become on larger enterprises for their survival, declaring that there are so many of these smaller businesses competing for survival they will never gain the upper hand in this relationship (International Labour Organization, 2002; Moser, 1994). Structuralists recognize that there are varying degrees of subordination and exploitation within the economy, though they predict that
independent producers will eventually fall victim to the domination of larger firms (MacEwen Scott, 1979). While the expected relationship between the size of a country’s informal economy and other variables is not always clear, structuralists predict a strong positive correlation between informality and inequality. In this school of thought, informality is likened to a poverty trap, and scholars are quick to blame the capitalist economic structure for this trap’s existence (Murphy, 1990).

Though structuralist descriptions of informality are initially appealing, they do not adequately relay the complexity behind the concept. Studies in this field tend to concentrate on the relationship between large firms and small producers. Many informal businesses sell their goods and services directly to the consumer, cutting out the intermediary effect which results in the exploitative relationship and causing structuralist studies to overlook an entire subset of informal actors (Moser, 1994). Though predictions that these producers will eventually become subordinate initially seem to address this issue there is no timeline associated with this calculation, making it difficult to prove either way (MacEwen Scott, 1979). Structuralists subscribe to the neo-Marxist view that the informal economy results from the capitalist system. Yet, in calculations of the informal economy’s size within individual countries, significant informal activity
is found in three Communist countries (Schneider & Bajada, 2005). The presence of a large informal economy during the Communist period in eastern Europe, is also widely recognized and studied (Kim, 2005; Neef, 2002). This data provides strong evidence that informality is more than just an indicator of those problems inherent to the capitalist system.

Legalists provide another prominent set of beliefs through which to view informality. Grounded in neo-liberal thought, this theory focuses on the role a country’s government plays in fostering informal activity (Chen, 2006; Rakowski, 1994a). Neo-liberal economists believe that government intervention into the market is harmful and should be kept to a minimum, a principle that provides the basis for legalist theory (Oatley, 2006). Advocates, including Hernando De Soto, suggest decreased government intervention in business on all fronts, after ensuring a minimum of contract enforcement and recognition of land rights (De Soto, 1989; Murphy, 1990; Oatley, 2006; Rakowski, 1994a). De Soto’s landmark study conducted in Peru during the eighties (discussed in detail in the introduction) provided astounding evidence that the government truly was stifling the growth of vibrant formal businesses (De Soto, 1989; Murphy, 1990). While legalist scholars focus on the barriers to market entry, they recognize that large,

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7 Though one could argue the degree to which the designated countries operate under a Communist system (China, Lao PDR, Vietnam), the fact that each supports a higher level of informal economic activity (ranging from 13.1% to 33.4%) than many advanced capitalist countries, including the United States, the United Kingdom, and Japan, is a blow to neo-Marxist claims (Schneider & Bajada, 2005).
formal firms are often in collusion with governments and help to create a system to their benefit (Chen, 2006; Rakowski, 1994a). Despite these setbacks, legalists see informality as a path to further economic growth if governments recognize the problem and provide the tools necessary for formalization, such as access to loans and property rights (Rakowski, 1994a).

Excessive government regulation is the heart of informal activity according to legalist theory (Rakowski, 1994a). Regulations adopted by the state can refer to anything from environmental or quality standards that firms must comply with to restrictions meant to protect the rights of workers, encompassing a wide variety of activities. A study using data collected from Latin American countries in 1990 found that government regulation is positively correlated with the size of the informal economy (Loayza, 1996). This relationship was found to be robust in a 1998 study which used data from Latin American, transition, and OECD economies to test various measures of regulation against the size of the country’s informal economy. High degrees of regulation consistently had positive correlations with amount of informal activity within the country (Johnson, Kaufmann, & Zoido-Lobaton, 1998). Prominent scholars in the field largely accept this relationship, though they are quick to note that the degree to which the regulations are enforced are just as, if not more, important than the regulations themselves (Johnson et al., 1998; Schneider, 2005; Tedds, 2005).
Critics of this school of thought claim that the legalist prediction of informality leading to economic growth is at best speculative and likely to hurt the country’s development (Portes, 1991). However, the legalist view of informality as a precursor to future economic growth, given good government policies, is supported by an array of researchers who have empirical evidence to back their claims. Many legalist scholars believe that entering the informal sector is simply the first step in the process of formalizing a business. According to Williams, the road to legitimacy through the formal economy is long, and individuals enter it gradually and with caution. The flexibility which characterizes the informal economy provides the perfect setting for potential entrepreneurs to hold a trial run of their proposed businesses in order to determine whether or not the hassle of formalizing is worth the benefits (Williams, 2005a; Williams & Round, 2007). In a study performed in England, Williams found that the majority of informal work was undertaken by self-employed individuals (undermining the assumption of many structuralists that everyone employed informally is subordinate to a dominating upper class) and that about one third of these self-employed individuals were part of the informal economy for the sole reason of formalizing in the future. Williams suggests that the best response of governments would be to increase the incentives for entering the formal economy, while leaving the informal economy to serve as an incubator for small businesses (Williams, 2005a). A similar population of informal business owners on the
border of formalization exists in the Ukraine, suggesting that this phenomenon is not limited to developed countries (Williams & Round, 2007). However, additional studies suggest that the informal economy is related to slow economic growth. Researchers studying Latin American nations found a strong negative correlation between the two variables, claiming that the informal economy causes a loss of tax revenue which funds important public services while simultaneously increasing the need for those very services (Loayza, 1996). While these findings initially appear at odds, they actually point to the same conclusion: given an acceptable level of regulations the informal economy can serve to propel economic growth. The Williams study found that one-third of informal individuals wanted to formalize. He goes on to detail the difficulty of formalization, which underlines the second study’s conclusion that the informal economy is correlated with slow growth as its participants are simply evading the burden of excessive taxes and regulation (Loayza, 1996; Williams, 2005a).

Legalist scholars view the informal economy as a mechanism to absorb formal workers who are left unemployed by sudden shifts in the economy while claiming that informal businesses are disadvantaged by their illegal status (Chen, 2006; Forastieri, 1999; Rakowski, 1994a). These assumptions tend to produce varying predictions of the relationship between inequality and the informal economy. Some scholars believe that informality and the informal economy are positively correlated, stating the loss in tax revenue deteriorates necessary social
programs that correct for inequality (Kim, 2005; Rosser, Rosser, & Ahmed, 2000). This view is supported by an empirical study using data from sixteen European transition countries. The results of this research found a significant, positive correlation between the two variables, indicating that high levels of inequality are related to a high degree of informal activity (Rosser et al., 2000). However, other scholars predict that inequality will decrease with the size of the informal economy, claiming that informal businesses smoothes the income gap. Those who support this view assert that the informal economy unintentionally serves to redistribute wealth as the poor do not pay taxes while the rich pick up the costs of public programs. The main difference between these predictions is,
as in the case of economic growth, the reason why businesses entered the informal sector (Kim, 2005).

An in-depth look into legalist theory, provided above, results in a compound set of predictions. As shown in Figure 2.2, legalists predict that the outcome of the informal economy depends on the types of policies enacted by the state. When the government provides an environment conducive to businesses, with moderate taxes and regulation, the informal economy will simply serve as a testing ground for businesses interested in formalizing (Williams, 2005a; Williams & Round, 2007). However, if the government is over-zealous in enacting regulations and imposing high taxes, the informal economy will also attract businesses who wish to avoid these burdens, or cannot afford to comply with them. This second set of informal actors will cause a reduction in the amount of taxes collected, allowing the government to spend less money on social programs and eventually slowing economic growth while raising inequality (De Soto, 1989; Rakowski, 1994a).

While the legalist perspective provides strong grounding for the position that informality is a result of over-regulation, its assumption that the number and quality of regulations are the only factors of concern is inadequate. Why are government policies the only consideration of individuals on the cusp of informality? Given the wide array of factors which face any individual making this decision, additional variables must be accounted for as well. In order to
better explain individual decisions regarding economic activity, informality must be viewed through the lens of a theory designed to explain individual behavior – rational choice theory.

Rational choice theory, illustrated in Figure 2.3, assumes that individuals always act to maximize their utility given the available information on the costs and benefits of such action (Anderson, 2006; Kraft & Furlong, 2007). Though originally developed to explain the behavior of individuals, researchers in many disciplines now apply rational choice theory to groups of people with similar interests in order to predict their behavior (Anderson, 2006). A rational choice approach to the informal economy suggests that there are numerous reasons explaining whether or not individuals will formalize. Schneider and Enste (2002) elaborated on rational choice theory to develop a holistic explanation for participation in the informal economy. They predict that circumstantial characteristics (i.e. norms and restrictions) combine with personal characteristics of the individual (i.e. motivation) to determine behavior, suggesting that explanations for entry should be drawn from many disciplines instead of focusing on economics. Though this study focuses on the regulatory and moral reasons behind entry, their model suggests that the informal economy results from many
variables, a prediction which supports the use of a rational choice in future studies (F. Schneider & Enste, 2002).  

Rational choice theory provides the basis for many studies that predict relationships between the informal economy and other variables. Dreher and Schneider (2006) discuss the impact of corruption on both high and low income countries. Their study declares the nature of corruption in low income countries to be different from that of high income countries. For example, one could reasonably expect corrupt officials in developing countries to accept bribes from informal businesses, reducing the costs of operating in that sector; this behavior

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8 For a detailed description of this model, see Chapter Six of The Shadow Economy: An International Survey (F. Schneider & Enste, 2002).
would not be as likely in more developed countries, so corruption is less likely to affect informality. The empirical evidence backed this hypothesis (Dreher & Schneider, 2006). Though the researchers in this study did not directly cite rational choice theory to validate their hypothesis, they indirectly relied on it, assuming all actors would make their decisions according to the information available and to maximize their utility. This is far from the only study to use the logic of rational choice to explain informal activity; the theory is often invoked when explaining the decision of individual actors to enter the informal sector (Chong & Gradstein, 2007; De Soto, 1989; Loayza, 1996).

As suggested earlier, both rational choice theory and the legalist perspective fall short of providing an adequate explanation of informality. Rational choice theory allows for exploration of reasons why individuals chose not to formalize, though it does not make predictions of how informality affects the big picture (Anderson, 2006; Kraft & Furlong, 2007). Using this theory as a base, education, gender equality, poverty, and corruption appear to be just as important as tax rates, regulations, and tax morality in determining an individual’s entry into the informal sector. On the other hand, the legalist perspective provides clear predictions of how informality will affect the country’s overall economic situation, though it does not allow for variation in why actors decide to formalize (Rakowski, 1994a; Women in Informal Employment: Globalizing and Organizing, 2008). A legalist theoretical base also allows for variation in results.
based on differing starting points, in which a country has either conducive or restrictive business policies. This study will use a combination of rational choice and legalist theories, referred to as rational legalist theory for the remainder of the paper, to explain both the causes and the consequences of informality. As illustrated in Figure 2.4, the rational legalist approach incorporates the flexibility of rational choice theory by allowing for multiple causes of informality. The sum total of constraints and incentives to enter the formal sector leads to an equilibrium which is either positive or negative. If positive, the majority of informal sector activity can be classified as start-up activity, referring to businesses for which informality serves as a testing ground for future formalization. However, if this equilibrium is negative, the majority of informal
sector activity is theorized to be evasive activity, encompassing those entrepreneurs avoiding the costs of formalization. As in legalist theory, the equilibrium reached leads to a distinct prediction of how it will affect the overall development of an individual country.

While it is practically tautological to claim that governments with good business environments, high levels of human capital, and gender equality have higher rates of growth, it is important to note that this is not the relationship proposed by the model. The rational legalist theory predicts that after countries are separated into two groups by the variables listed above (gender equality, education, corruption, etc.), the predicted outcomes (high/low growth) will be correlated to the size of the informal economy. Countries that have conducive environments are predicted to have growth rates that are positively correlated to the level of informality within the country. In this situation, the informal economy is predicted to consist mainly of start-up businesses which formalize when the opportunity arises. However, those countries which fall in the “restrictive” category are predicted to have growth rates that are negatively correlated with informality. This equilibrium is predicted to result in a large number of businesses evading formality, resulting in stalled growth within the country.

While specifics of the explanatory variables are discussed in the following section, along with the rationale for their inclusion, it is essential to keep the
The theoretical backing in mind throughout the discussion. The informal economy consists of those businesses which are avoiding government oversight (Schneider & Bajada, 2005). The rational legalist model predicts that there are many factors which can explain this behavior, but the effect that this avoidance will have on a country’s overall economic growth is determined by the individual’s underlying reasons for conducting business informally, as these reasons will determine future behavior of that individual, namely whether or not the informal business will eventually formalize.
Part III

Data: Identifying and Quantifying the Concepts
This section will detail the selection rationale for and proposed relationship between a country’s informal economy and the proposed explanatory variables to be tested in this study. Each variable is supported by the rational legalist model, and proposed relationships are discussed in context with past studies on the subject. This description is followed by a detailed discussion of each measurement choice, with a focus on the informal economy.

**Selecting the Explanatory Variables**

*Taxes, Regulation, and Government Quality*

As discussed in the previous section, legalist theory tends to rely on the government’s intervention into the market as an explanation for informal activity. For this reason, both high tax rates and a high degree of government regulation have been established as causes of informality. In addition to these variables, the ability of the government to enforce the regulations enacted and collect taxes is crucial (Johnson et al., 1998; Loayza, 1996; Schneider & Enste, 2002; Schneider, 2007; Tedds, 2005). Given the predictions of legalist theory, a positive relationship is expected between informal activity and the degree of taxation or regulation. Informal activity will likely have a negative relationship with the quality of government, indicating the government’s ability to enforce those regulations and taxes enacted.

*Corruption*
Corruption is commonly portrayed as a determining factor in the emergence of informality when discussing lower and middle income countries. High levels of internal corruption effectively lower the cost of remaining informal, as business owners that are caught can expect to avoid punishment with a bribe (Dreher & Schneider, 2006).\(^9\) This phenomena is particularly likely to emerge in countries where taxes are extremely high and regulations dense, increasing the costs of compliance (Rose-Ackerman, 1999). As corruption reduces the cost of remaining informal through reducing the chances of being caught and formally punished, rational choice theory leads to the prediction of a positive relationship between corruption and informality within a given country (De Soto, 1989; Dreher & Schneider, 2006; Enste, 2005; Loayza, 1996)

\textit{Poverty}

As poverty is often described as a defining feature of the informal economy, the relationship between informality and low-income levels is hard to ignore (Mead & Morrisson, 1996; A. Ypeij, 2000). The most common explanation for this relationship depicts the informal economy as a coping mechanism for those living in poverty. Entering into informality is portrayed as a

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\(^9\) The study conducted by Dreher and Schneider (2006) separates high and low income countries to discover two different relationships between corruption and informality. This study proposes that this relationship has less to do with income level and is more likely related to a range of other factors with are correlated with high income levels, such as more stable legal structures and better protection from extortion. This is an issue addressed by the separating equilibrium of incentives and constraints presented in the theory chapter, essentially the second step in rational legalist theory.
last resort, necessary to the survival of low-income families. Previous research has dubbed this type of activity the “survival economy,” finding that it comprises a large part of informal activity in both Romania and Bangladesh (Huq & Sultan, 1991; Neef, 2002). This theory relies on a model in which rational actors base entry into the informal economy by the gap between their desired and real income levels, meaning that those with extremely low incomes or high desired consumption will enter the informal economy (Kim, 2005). Given the relationship between poverty and informal activity discussed above and presented in previous research, a positive relationship is expected between the two variables.

Education

Education likely plays a role in the constraints an individual faces in entering the formal sector. In countries where regulations and tax codes are arduous to follow, individuals with little to no education will find it more difficult to comply, even if they wish to do so. As predicted by the rational choice theory, these individuals will recognize lack of education as a constraint to formalization and will be less likely to go through the process as a result. Given this interaction, a negative relationship between education and informality is predicted. This relationship is backed up by previous research that cites the problems faced by illiterate individuals attempting to access credit and other resources in order to start a business (Debrah, 2007; Huq & Sultan, 1991). However, the empirical
evidence on this relationship is varied. Though one case study indicated that members of the informal economy have higher average levels of education than the remainder of the country, other studies have noted the increased likelihood that individuals with lower education levels will be more likely to participate in the informal economy than their educated counterparts (Andresen, Ogedal, & Strom, 2005; Morrisson, Solignac Lecompte, & Oudin, 1994).

Gender Equality

Though not as obvious as the previously proposed variables, gender equality within a country also plays a role in the decision to remain informal. In countries where conventions depict men as breadwinners and women as homemakers, entering the formal sector can be particularly difficult for women. Finding employment as a woman under these circumstances is complicated further by the societal norms that often accompany them, making the husband feel inadequate if his salary is not sufficient to provide for his entire family (Mernissi, 1987). Research in the Middle East suggests that women in these highly traditional societies are more likely to engage in informal than formal economic activity as informality is by nature difficult to detect and therefore less apt to result in negative public consequences (Jennings, 1998; Mernissi, 1987). Given the hypothesized effect of gender inequities, this type of inequality is predicted to cause more informal activity, resulting in a positive relationship with informality.

Age Distribution
This variable refers to the balance between age groups within a country. For example, a country with a disproportionately large number of retired individuals or young children as compared to middle-aged working individuals is considered to have an imbalanced age distribution. Many of the studies researching the relationship between age distributions and development conclude that an excess of dependents within the country leads to much slower growth rates as investment is diverted to care for the young (Crenshaw, Ameen, & Christenson, 1997). As a highly imbalanced age distribution will also likely affect an individual’s decisions regarding employment, it is important to address this variable in the context of choosing to enter the informal economy. The inability to obtain a job in the formal sector, with its related benefits of labor protection and generally higher wages, is a commonly cited reason for informal activity, especially among the very young and old (Perry et al., 2007). Given this information, it seems as though an age imbalance within a country’s population would lead to a larger informal economy as individuals of non-working age tend to have a more difficult time entering the formal sector than those of traditional working age.

Expatriates

In order to compete on the world market, businesses within a given country must become more efficient as their level of exports increases. Using data from the 1990’s, one study found that the job increases related to increased
exports went disproportionately to employment in the informal sector (Stallings & Peres, 2000). There are several possible reasons for this. On the one hand, increased exports mean that businesses are forced to be more efficient so they can compete in world markets. If increased efficiencies led businesses to fire many of their previous workers, these individuals may find refuge in the informal sector (Marjit, Kar, & Beladi, 2007; Stallings & Peres, 2000). The other explanation relies on the widely accepted assumption that the informal sector produces goods at a lower cost, as these businesses do not comply with costly government regulations (Rakowski, 1994a). This argument suggests that firms will seek inputs at the lowest possible cost in order to produce a cheaper final good. Both of these theoretical relationships would lead to a positive relationship between a country’s exports and the size of its informal economy.

*Growth*

The inclusion of a measure of growth is essential to test the final section of rational legalist theory. As previously discussed, rational legalist theory predicts that the informal economy will foster growth when the environment is conducive to businesses and inhibit growth when the environment is restrictive. This prediction is based on two divergent theories which predict the outcome of informal activity. The first theory predicts that the informal economy will lead to economic growth as it provides a starting point for entrepreneurs hoping to eventually formalize. As these individuals enter the formal economy, their
earnings are officially recording in GDP calculations, leading to higher levels of recorded economic growth (Williams, 2005a). Additionally, informal actors are forced to hide their activities from the authorities, causing them to operate on a smaller scale than is efficient so as not to be caught (Loayza, 1996).

Formalization will allow these individual businesses to increase growth via savings in efficiency. The more businesses that formalize, the larger the effect of this increased efficiency of growth. The second growth theory regarding informal activity predicts exactly the opposite outcome, in which a large informal economy will lead to lowered economic growth. This theory relies on an endogenous growth model, presented in further detail in Loayza (1996), which points to technological progress, partially dependent on congestible public services, as a main driver of economic growth. The informal economy acts to increase the number of people using these services, while simultaneously decreasing the relative amount of money per capita spent on providing these services as informal actors do not pay taxes. This decreases the utility derived from the use of these public services for everyone, leading the less technological progress which in turn inhibits growth (Loayza, 1996). Rational legalist theory predicts that the positive effects of informality will outweigh the negative when the business environment is conducive, but the negative effects will overpower the positive ones in a restrictive environment.
Measuring the Variables

The final compilation is a panel data set containing the dependent variable, size of a country’s informal economy, measures for all eight explanatory variables discussed above, and each country’s GDP growth in 2005 to test the second half of the rational legalist theory. This data set includes information for one hundred and twenty four countries in both 2000 and 2005. In cases where data for any of the chosen variables is unavailable, the country was dropped from the set. Descriptive statistics for each of these variables is available in Appendix A.2.

Informality

As the very nature of informality is characterized by hiding from the state’s notice, it follows that measuring this variable is inherently complicated. Accepted methods of estimating the informal economy range from conducting surveys and monitoring energy use within a country to gathering information on a range of variables in order to predict informal activity. As each method of estimation is unique, they all come with a different set of problems to address.

Surveys rely on individuals providing correct information regarding an activity

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10 There are 124 countries in the main data set. For the additional data collected as check on the tax burden variable there are only 89 countries. The countries included in the main dataset are listed in Appendix B.1, with a list of those dropped for the tests using the second tax burden variable in Appendix B.3.

11 With the exception of GDP growth rates, as only one year is used to test the second part of rational legalist theory.

12 While dropping variables due to lack of information brings up the problem of sample bias, very few countries were actually dropped for this reason. Refer to the list in Appendix B2.
which, by definition, they are trying to conceal. Additionally, this form of estimation is very difficult to do on a large scale, resulting in detailed information for a small number of countries. For example, monitoring energy use is problematic as not all informal activities use electricity and available technology results in vastly differing energy use for the same end product, especially when comparing activity in different countries (Schneider & Bajada, 2005). The DYMIMIC (dynamic multiple indicators multiple causes) model, using multiple variables to estimate informal activity, is used in this study.

The DYMIMIC model, first used in the early nineteen eighties, has since become a commonly accepted method to estimate informality (Loayza, 1996; Perry et al., 2007; Tedds, 2005). This approach to estimation gathers two sets of data: causes that are theorized to lead to high levels of informality and indicators which are theorized to be results of informality. The dataset used in this study identifies tax burdens, regulations, GDP per capita, and unemployment among those variables considered as causes, while money supply, GDP growth, and employment are among those classified as indicators. After compiling the list of causes and consequences, an econometric analysis which identifies the informal economy as a latent variable, is used to calculate an index of informality

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13 For an in-depth discussion of additional ways to estimate the size of a country’s informal economy, see Schneider & Bajada, (2005) or Giles and Tedds (2002).

14 For a further discussion of how the model to estimate this data was set up, refer to Appendix One in Schneider (2007).
(Schneider & Bajada, 2005; Schneider, 2007). To acquire concrete numbers, a benchmark is needed. This is provided through use of the currency demand estimation method, which examines the actual amount of currency in circulation compared to the predicted amount given a variety of conditions (wages, taxes, interest rates, etc). Extra money in circulation is presumed to be a result of informal activity. The use of currency demand estimation allows for the measure of informal economy to be presented as a percentage of GDP (Giles & Tedds, 2002; Schneider, 2007).

As with any method of estimating informality, there are issues which must be recognized in using the DYIMMIC model. Primarily, the estimates produced by this model are only as good as the variables used to calculate the data. If the predicted relationships of causal and indicator variables with informality do not exist, the resulting estimates will be useless (Tedds, 2005). In order to avoid this problem, Schneider (2007) uses only those variables which have widely accepted relationships with informality in the creation of his model. The validity of these estimations is attested to by previous scholars who have included Schneider’s estimates in their work on informality (Chong & Gradstein, 2007; Dreher & Schneider, 2006; Perry et al., 2007). The benefits of using the DYIMMIC model must also be accounted for. Its flexibility allows for several factors, instead of only one, to play into the determination of estimates. Also, the advantage of
having large datasets for cross-country comparisons, a particularly strong point with this model, is especially important for a study of this nature (Tedds, 2005).

**Regulatory Quality**

Calculating the burden of regulations is complicated due to the multiple reasons that regulations can be oppressive to the growth of businesses. The World Bank’s Regulatory Quality score produced for the World Governance Indicators dataset takes into account several measures complied by other institutions, from non-government and survey organizations to public and private firms. This composite score is designed to capture the government’s ability to promote growth of business through the implementation of effective laws. The final indicator accounts for a wide variety of regulatory burdens, including the complexity of the tax code, restrictions on competition (including trade barriers), and the difficulty of starting a business among many other factors. Scores range from -2.36 to 2.03, with larger scores indicating better regulations (D. Kaufmann, Kraay, & Mastruzzi, 2007; World Bank Institute, 2008). The quality of this indicator is widely recognized, a fact highlighted by the Millennium Challenge Corporation’s decision to use it in calculations of a country’s level of economic freedom (Millennium Challenge Corporation, 2008).

**Fiscal Freedom**

As with regulation, it is essential to account for the tax burden within a country, but it is difficult to capture everything necessary using only one measure.
For this reason a composite that considers multiple aspects of the tax burden is used. The Fiscal Freedom score created by the Heritage Foundation takes into account the tax burden on individuals and corporations, as well as total tax revenue as a proportion of GDP. This measure allows for a well-rounded view of the tax burden faced by individuals in the country, especially those in the formal sector (Heritage Foundation, 2008). In calculating the 2008 Index of Economic Freedom, the Heritage Foundation released data for 1995-2008, updating all indices so data is comparable across years. This updated data set is used in the following analysis.

**Government Effectiveness**

The quality of government variable is meant to capture the degree to which the government is able to enact and carry out sound policies. In order to quantify this concept, the Government Effectiveness indicator, compiled as part of the World Governance Indicators dataset, is used. This measure is designed to account for the “quality of public services…civil service…policy formulation and implementation, and the credibility of the government’s commitment to such policies” (D. Kaufmann, Kraay, & Mastruzzi, 2007, p. 3). Similar to the other data gathered from the World Governance Indicator set, Government Effectiveness is compiled using a variety of measures gathered from several different sources (D. Kaufmann, Kraay, & Mastruzzi, 2007). The data ranges from -1.53 to 2.28, with higher scores indicating a more effective government and
lower scores indicating the opposite (World Bank Institute, 2008). As with regulations, the quality of this indicator is recognized by the Millennium Challenge Corporation’s decision to use it in calculations of a country’s ability to rule justly (Millennium Challenge Corporation, 2008).

Control of Corruption

Corruption is predicted to have a positive correlation with informality, making avoidance of punishment when informal economic activity is detected much easier. The following study utilizes the Control of Corruption measure compiled by the World Bank for the Word Governance Indicators to quantify corruption within a country. This index compiles multiple measurements collected by other organizations to form the indicator.15 Designed to capture the degree to which “public power is exercised for private gain,” the Control of Corruption variable accounts for a wide range of activities, from the payment of small bribes to stay in business to large-scale activities performed by the country’s elite (D. Kaufmann, Kraay, & Mastruzzi, 2007, p. 4; D. Kaufmann, Kraay, & Mastruzzi, 2004). Scores range from -1.47 to 2.41, with larger scores indicating less corruption within the country (more control of the problem) and lower scores indicating higher levels corruption (D. Kaufmann, Kraay, & Mastruzzi, 2007a; World Bank Institute, 2008). This quality of this indicator is

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15 For further discussion of the World Governance Institute, see the discussion related to regulations.
widely recognized, a fact highlighted by the Millennium Challenge Corporation’s
decision to use it in calculations of a country’s level of ruling justly (Millennium
Challenge Corporation, 2008).

**GDP per capita (PPP)**

This variable is meant to capture the severity of poverty within a given
country, as the high costs of formalizing are predicted to cause elevated levels of
informality. Gross domestic product (GDP) in constant 2000 international dollars
at purchasing power parity (PPP) is used to measure this variable as calculating
GDP in this manner accounts for the differences in what can be bought from
country to country with a given amount of money. Though not perfect it is a
common method of estimating poverty. The data used below was collected by the
World Bank and is available online the World Development Indicators database
(World Bank Group, 2007).

As GDP per capita (PPP) results in a set of large numbers, especially in
comparison to the other explanatory variables in the set, this measure is rescaled
for the tests so as not to produce confusing results. For the remainder of this
study, this variable is measured in thousands of dollars. So the United States,
with a GDP per capita (PPP) of $37,267 in 2005, would have a recorded
measurement of 37.27, while Malawi with a GDP per capita (PPP) of $594 would
be measured as 0.59 (World Bank Group, 2007).
The education variable is meant to capture the degree to which individuals within a given country have the skills necessary to comply with regulations and tax codes set by the government. The United Nation’s education index, compiled as part of the Human Development Index (HDI), is used to quantify education within a country. To control for the data collection and computation method changes that occur from year to year, standardized data which controls for these changes\textsuperscript{16} to produce comparable data is utilized (Human Development Report Office, 2008).\textsuperscript{17} The education index itself is calculated using two main indicators, adult literacy and gross enrollment ratios, resulting in an index score of 0-1. The score decreases to reflect lower education levels within the country (United Nations Development Program, 2007).

As the education index is measured from 0-1 while the majority of explanatory variables are presented on a much larger scale, this variable is rescaled in order to make the results as clear as possible. Each education index score is multiplied by 100, so index scores now range from 0-100 instead of 0-1.

\textsuperscript{16} The updated data is not available for all countries. In cases where updated data was unavailable, the original index was used. This substitution was only utilized in cases where the education index was unavailable for only one of the two years and allowed for the preservation of several data points.

\textsuperscript{17} This data is not readily available on the website, though is easily obtained by contacting the Statistics department of the UNDP.
The United States, with an education index of 0.97 in 2005 has a rescaled score of 97 (Human Development Report Office, 2008).

**Female Labor Force Participation**

In order to properly capture the degree of gender inequity within a country, this study will use the labor force participation rate of females found in the World Bank’s World Development Indicators database. Calculated by the International Labor Organization, this measure accounts for the percentage of females aged 15-64 who are economically active (World Bank Group, 2007). As countries with higher levels of gender inequity will likely lead to lower levels of recognized economic participation among females, this variable will indicate whether or not this lower economic participation is correlated with higher levels of informal activity.

**Dependency Ratios**

In order to capture the degree to which an age imbalance in a country’s population likely influences the level of informality, dependency ratios are utilized. Dependency ratios measure the number of dependents, defined as individuals younger than 15 or older than 64, to those of working age. A ratio above one indicates a country with more individuals of non-working age than of working age. This data was gathered from the World Development Indicators database and is calculated by the World Bank (World Bank Group, 2007). The relationship between informality and an age imbalance is expected to be positive.
As the results are easier to report when all explanatory variables are scaled in a similar manner, dependency ratios have been rescaled for the purposes of this study. The rescaled variable takes each dependency ratio and multiplies it by a hundred. Where a score of one used to signify a perfect balance of working age individuals and dependents, this is now signified by one hundred. A dependency ratio of 0.70, rescaled to 70, indicates that there are seven dependents to every ten individuals of working age within that country’s population.

Exports

Exports are measured using the total merchandise exports data from the World Trade Organization. This data set accounts for all goods that the country exported within a given year, using the transaction value to quantify how much the goods are worth. General trade figures are used for most points, though in situations where that information is not available special trade numbers are used (World Trade Organization, 2008). The statistics provided by the World Trade Organization do not account for the overall size of the economy,\textsuperscript{18} so each data point was divided by the country’s GDP in order to achieve a percentage measure of exports to the size of the country’s economy. The GDP figures from the World Development Indicators database are used to make this calculation (World Bank Group, 2007).

\textsuperscript{18} The data is provided in terms of current US dollars.
Growth

Though not an explanatory variable, finding a measure for a country’s economic growth is essential to test the second part of rational legalist theory. For the purposes of this study, economic growth is captured by the annual change in GDP, as calculated by the World Bank using data from their own records as well as OECD national accounts information (World Bank Group, 2007).
Part IV

Methods & Results: Causal Factors
The following section gives an in-depth description of the methods used to test the first part of rational legalist theory, followed by an in-depth discussion of the results of those tests and their significance. The first set of tests is designed to determine which of the proposed explanatory variables are actually correlated with the informal economy. These results indicate that female labor force participation, poverty, and dependency ratios are strongly correlated with informality, while measures of government effectiveness and the education index have slightly weaker relationships with the dependent variable. Traditional explanations of informality, measures of regulations, the fiscal burden, and control of corruption measures were found to be insignificant, though there are probably additional factors at work.

**Methods**

As presented in Part II, the first step in testing rational legalist theory is to establish which of the explanatory variables presented are truly determinants of informality. This is accomplished through a first-differenced regression. As its name suggests, the first-differenced model uses the difference in observations of a given variable between 2000 and 2005 in order to test whether or not the changes in explanatory variables are correlated with changes in the dependent variable. A better understanding of what causes changes in the size of a country’s informal economy provides a more detailed understanding of the state’s overall level if informal activity, and the first-differenced equation allows for results stronger
than those from a pooled panel data test by controlling for unmeasured variations inherent between countries. For example, part of the variation in informality between the United States and Peru can be explained by the increased tolerance of informal businesses among the general public in Peru. It is simply easier to conduct business informally if more people are willing to buy from informal businesses. As this is a variable unlikely to change in five years and exceedingly difficult to quantify, the first-differenced equation effectively controls for it (and other variations of this nature) by focusing on the shift in size of the informal economy instead of looking at the size alone (Woolridge, 2006). As shown in Figure 3.1, this method of estimation utilizes the change in size of the informal economy from 2000 to 2005 as the independent variable, and estimates the importance of explanatory variables by looking at the change in these measures between the same time period. Equation One represents a general first differences equation, while Equation Two is the specific model used to test the data.¹⁹

Though the use of first-differenced regressions does come with a few sacrifices, these loses are well-worth the benefits provided by using the model. As previously discussed, a first differenced regression controls for those environmental variations between countries which are difficult to measure. Data points are calculated by taking the difference of two observations, so this model has lower statistical power than performing the tests as a pooled panel data set,

¹⁹ For a further discussion of how Equation One is derived, please refer to (Moody, 2005; Woolridge, 2006).
which would essentially ignore the fact that there are two observations in each country. The data set for this study is particularly strong, with complete information on one hundred and twenty four countries, so the statistical power lost by using a first-differenced model is not a problem.

\[
(y_{i2005} - y_{i2000}) = \delta_0 + \beta_1(x_{i(2005)1} - x_{i(2000)1}) + \beta_2(x_{i(2005)2} - x_{i(2000)2}) + \ldots + (u_{i2005} - u_{i2000})
\]

(Equation One: General)

\[
\Delta \text{inf} = \delta_0 + \beta_1\Delta \text{gen} + \beta_2\Delta \text{edu} + \beta_3\Delta \text{cor} + \beta_4\Delta \text{pov} + \beta_5\Delta \text{reg} + \beta_6\Delta \text{tax} + \beta_7\Delta \text{qual} + \beta_8\Delta \text{age} + \Delta u_i
\]

(Equation Two: Specific)

- \text{inf} = size of the informal economy (DV)
- \delta = change due to time (IV)
- \text{gen} = female labor force participation (IV)
- \text{edu} = education index (IV)
- \text{cor} = control of corruption measure (IV)
- \text{ex} = exports (IV)
- \text{pov} = GDP per capita PPP (IV)
- \text{reg} = regulatory quality measure (IV)
- \text{tax} = fiscal freedom measure (IV)
- \text{qual} = govt’ effectiveness (IV)
- \text{age} = dependency ratios (IV)

*DV – Dependent Variable
*IV – Independent variable

---

20 By taking the difference between 2000 and 2005 to serve as the variable of interest, the dataset is reduced to one observation where there were two. The pooled testing method would run each observation as an individual data point with a dummy variable to control for time.
Results

The results of the first test, a first-differenced regression, are presented in Figure 4.2 on the following page. While looking at the correlation coefficients alone to make judgments is tempting, it is important to remember that these statistics must be interpreted in the context with the scale on which the variable is reported, as well as the level of statistical significance. Figure 4.2 is organized with correlation coefficients listed above the standard errors, which are in parentheses. In order to present the data in a way which is not misleading upon first glance, several of the variables have been rescaled.\footnote{A further discussion of this decision is located in the previous section. The rescaled variables include poverty, education, and dependency rations.}

\footnote{For a quick reminder of this scale, refer to Figure A.2 in Appendix A or the Data section of this paper.}
## Figure 4.2 First-Differenced Regression Results

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Test One</th>
<th>Test Two</th>
<th>Test Three</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Labor Force Participation</td>
<td>-0.12** (0.05)</td>
<td>-0.11** (0.05)</td>
<td>-0.12*** (0.05)</td>
</tr>
<tr>
<td>Education Index</td>
<td>0.05^ (0.04)</td>
<td>0.04 (0.04)</td>
<td>-</td>
</tr>
<tr>
<td>Control of Corruption</td>
<td>-0.18 (0.76)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>GDP per capita (PPP)</td>
<td>-0.56*** (0.14)</td>
<td>-0.62*** (0.12)</td>
<td>-0.56*** (0.11)</td>
</tr>
<tr>
<td>Fiscal Freedom</td>
<td>-0.01 (0.02)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Regulatory Quality</td>
<td>-0.62 (0.67)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dependency Ratios</td>
<td>-0.16*** (0.04)</td>
<td>-0.15*** (0.04)</td>
<td>-0.16*** (0.04)</td>
</tr>
<tr>
<td>Government Effectiveness</td>
<td>1.13* (0.77)</td>
<td>0.72 (0.60)</td>
<td>-</td>
</tr>
<tr>
<td>Exports</td>
<td>0.76 (1.47)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Constant</td>
<td>0.73** (0.31)</td>
<td>0.84*** (0.28)</td>
<td>0.84*** (0.26)</td>
</tr>
<tr>
<td>Adj. R^2</td>
<td>0.296</td>
<td>0.308</td>
<td>0.301</td>
</tr>
<tr>
<td>F-Stat</td>
<td>6.76</td>
<td>11.95</td>
<td>18.62</td>
</tr>
<tr>
<td>Degrees of Freedom</td>
<td>123</td>
<td>123</td>
<td>123</td>
</tr>
</tbody>
</table>

The first numbers are regression coefficients (β), while the numbers in parenthesis are standard errors.

** Significant at 5% level
*** Significant at 1% level
* Significant at 15% level
^ Significance at the 20% level

Sources: See Figure A.1 in Appendix A
The initial regression performed, Test One, indicates that many of the variables expected to cause informal activity are unrelated to changes in its size. Though the correlation coefficients for the measures of corruption control, regulatory burden, fiscal freedom, and exports reflect the relationships predicted, each of these relationships is statistically insignificant. In fact, a test of joint significance indicates that these variables can be dropped simultaneously using any commonly accepted level of significance. As correlation among the independent variables is very low, and heteroskedasticity is not a problem, these issues are not factoring into the presented results. The second test presented in Figure 4.2 drops those variables found to be jointly insignificant, strengthening the overall regression as seen through the adjusted $R^2$. While the third test in Figure 4.1 drops both of the variables which are insignificant at the 20% level, doing so lowers the overall power of the equation as reflected in the adjusted $R^2$. It should be noted here that the variance in first differenced data is often smaller than what would be ideal. This can be seen in Figure A.3 in Appendix A, and often results in the problem of inflated standard errors (Woolridge, 2006). This issue should be fully considered before dropping any variables or deciding that they are insignificant. There are several possible reasons that the variation is low.

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23 An F-test indicates that these variables are jointly insignificant, with a p-value of 0.73.
24 Refer to Figure A.4 in Appendix A for a table with all correlations.
25 Going back to Regression One, a test of joint significance indicates that these two variables can be dropped along with the other jointly insignificant variables, though the p-value is much lower.
26 Inflated standard errors affect estimates of statistical significance.
Not only is the period of observation rather short, but certain variables, such as education and government quality, are likely to be slow to change in only five years. With these problems in mind, the results from the second regression will be those primarily referred to in the following discussion of results.

Surprisingly, the relationships of both the education index and dependency ratios are opposite of the theoretical predictions. As shown in Figure 4.2, an increase in the education index is associated with an increase in informality. However, the correlation coefficient indicates that the practical significance of this relationship is also quite low, with a tenth of a point increase in education index leading to half a percent increase in the informal economy. As the education index is calculated using information on gross enrollment ratios for primary, secondary, and tertiary schooling along with literacy rates, a tenth of a point increase would be equivalent to an increase of 15% in the literacy rate or a 30% increase in gross enrollment ratios (Human Development Reports, 2007). For the small change of 0.05% in the informal economy, this relationship is not practically significant. The relationship between a country’s dependency ratios and the informal economy is also opposite to theoretical expectations, with more individuals of traditional working age (15-64 years old) being related to a larger informal economy. Practically, a tenth of a point increase in the dependency

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27 This was the longest period (2000 to 2005) that could be utilized given available estimates of the informal economy.
28 Remember that the education index was rescaled for the purposes of this test to range from 0-100 instead of 0-1.
ratio\textsuperscript{29} is associated with a 1.6\% decrease in the size of the informal economy as a percentage of GDP. A tenth of a point increase in a country’s dependency ratio could be brought about if a country with a perfect balance of ten dependents to ten individuals of working age shifted to eleven dependents per ten working age citizens, perhaps brought about by a decrease in the infant mortality rate in a given country.

The female labor force participation measure and GDP per capita (PPP) variables reflect the predicted relationship with informality and are also significant from a practical standpoint. Practically, a $1,000 increase in GDP, per capita (PPP) is associated with a 0.62\% decrease in the size of the informal economy as a percentage of GDP. This is equivalent to saying that a $10,000 difference in GDP per capita (PPP), or roughly the difference between the United States and Japan in 2005, accounts for a difference of 6.2\% in the size of the informal economy (World Bank Group, 2007). As previously stated, the correlation between female labor force participation and the informal economy is in the predicted direction with an increase in the number women participating in the labor force associated with a decrease in the informal economy as a share of GDP. A ten percent increase in women participating in the labor force is related to a 1.2\% decrease in the size of the informal economy (as a percentage of GDP). This means that a 30\% increase in the labor force participation rates by females,

\textsuperscript{29} This variable was rescaled as well. Instead of 1 meaning that the two age groups are equal, 100 signifies that occurrence.
or essentially the difference between the United States and Chile in 2005, is associated with a 3.6% difference in the size of the informal economy (World Bank Group, 2007).

Though the statistical significance of the government effectiveness measure is borderline, the actual relationship between the government effectiveness composite and the informal economy is opposite of what was predicted. While the practical significance of this relationship is less intuitive, it is also rather low. A one point increase in the government effectiveness score correlates with a less than one percent increase in the informal economy. As the government effectiveness measure runs from about -2.5 to 2.5, an increase of one is actually quite large, especially in relation to such a small change in the informal economy. This difference is essentially the same as that between Germany and Croatia in 2005 (World Bank Institute, 2008).

Correcting Possible Problems

Given the strong body of literature supporting the ties between regulations, taxes, corruption, and the informal economy these results are highly unexpected. There are a few possible reasons for this apparent difference, from lack of sufficient variability in the data to problems with those measures used to

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30 As mentioned earlier, the standard errors on several of these variables may be inflated due to low variance in first-differenced data. For this reason, some leeway is granted to those variables with lower levels of statistical significance than what is normally considered appropriate.

31 These studies are discussed in great detail throughout Part II.
quantify the variables. Both of the problems are discussed in greater detail within this section.

The first issue that must be addressed in using a first-differenced equation is the problem of variability within the data. While this is obviously more of a concern in those variables less likely to change in a five year period, such as education, it is something that affects the entire regression to some degree.\footnote{See Appendix A.3 in for information concerning the variability of the first-differenced data.} This could easily be corrected by treating the data as a random sample pooled panel set, essentially performing a cross-section test on the data while controlling for the year as though it were just another variable. However, this method of testing would be inappropriate as it does not control for those variables inherent to each country that are likely remain constant over time (such as the cultural acceptance of informality). As these factors are highly difficult to quantify, it is necessary to use a first-differenced regression to control for them. Finally, the data was collected in a manner to ensure that two data points exist for each country which makes the assumption of a random sample difficult to defend (Woolridge, 2006).

The other possible problem, using a measure that does not properly reflect the variable in question, is easier to test. The robustness of the indicators compiled by the World Governance Institute is quite high given the manner in which they are calculated.\footnote{Refer to the discussion of the regulations in the previous section for a further description of the World Governance Indicators.} However, the concepts discussed are not easy to
capture, and no measure is perfect. For this reason, alternate tests are conducted using different measures of regulations, tax burden, and corruption. For regulations, the measure of Business Freedom, calculated by the Heritage Foundation, is utilized. The corruption check also uses an indicator compiled by the Heritage Foundation, entitled Freedom from Corruption. The final alternate indicator employed measures the tax burden faced by individuals within a given country. This is quantified by the estimates on a country’s top marginal tax rate, as determined by the Economic Freedom of the World index (Gwartney et al., 2007).

The results of using alternate measures for the variables as described above are listed in Figure 4.3. The first column of data refers to the results of Test One in Figure 4.2, provided for ready comparison between the two tests, while the fourth and fifth tests are conducted using the new test measures of the three variables in question. Test Six is performed using the new measures of corruption and regulations with the old tax burden measure. This is necessary

34 The Business Freedom measure identifies indicators of burdensome regulations (such as the number of procedures to start and close a business, the cost of doing so, time it takes to obtain the proper license, etc.) and assigns each country a score with 100 indicated the best regulatory environment possible for a business (Heritage Foundation, 2008).
35 The Freedom from Corruption variable measures the degree to which a country’s citizens are free from the burdens that accompany high degrees of corruption. This measure is primarily based on perceptions of corruption, with a focus on how they affect an individual’s ability to conduct business. Each country is assigned a score with indicating the most corruption and 100 indicating the least (Heritage Foundation, 2008).
36 This measure is actually an index of the top marginal tax rates. The Fraser Institute collects the marginal tax rates of both income and payroll taxes within each country, and indexes the largest one for this measure. Large scores indicate those countries with lower tax rates, while small scores indicate higher tax rates (Gwartney et al., 2007)
given the severe drop in observations required by using the new measure of tax burden and subsequent changes in several of the unrelated variables. The switch results in the loss of thirty five observations, introducing the possibility of bias and requiring a comparison using just those measures which are able to fully utilize the original sample.

As shown in test six of Figure 4.3, the shift in measurement changes the significance of both the tax burden and corruption variables, while regulation remains insignificant. Though the corruption variable appears changed with the use of a new measure, a quick look at the sixth regression suggests that the shift is actually due to an interference of the new tax burden variable. While this could be due to an unanticipated interaction between the top marginal tax rate and perceptions of corruption within a country, it is more likely that the exclusion of so many countries, due to unavailability of data, is the true root of this change. Though the education variable is no longer significant with the change in measures, this is not a surprising finding. The education index was only important at a very lax degree of significance in previous tests. As the alteration in measurements does not affect the predicted relationship between variables, it can be safely concluded that this shift is not of great importance to the overall results of these tests.

37 For a list and further discussion of those countries dropped by switching to the second measure of tax burden, see Figure B.3 in Appendix B.
While changes in the significance of the tax burden variables are important, the importance of this change should not be over-stated. While the direction of the relationship is as predicted,\textsuperscript{38} with an increase in the top marginal tax rate accompanying an increase in the informal economy, the practical significance appears to be rather low. As the scores for the top marginal tax rate range from 1-10, a one point shift is rather large and results in the small decrease of 0.18% in the size of the informal economy (as part of GDP). This combined with the low level of statistical significance and the problem of a reduced sample size suggests that changes in the tax burden measure are not important in this set of tests.

\footnote{\textsuperscript{38} Remember that the data released by the EFW is an index of top marginal tax rates, with larger scores indicating better (i.e. lower) tax rates and lower scores indicated higher tax rates (Gwartney et al., 2007).}
### Figure 4.3 First-Differenced Regression Results, Second Round

**Dependent Variable: Informal Economy**

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Test One</th>
<th>Test Four</th>
<th>Test Five</th>
<th>Test Six</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Labor Force Participation</td>
<td>-0.12**</td>
<td>-0.12**</td>
<td>-0.12**</td>
<td>-0.12**</td>
</tr>
<tr>
<td></td>
<td>(0.05)</td>
<td>(0.05)</td>
<td>(0.05)</td>
<td>(0.05)</td>
</tr>
<tr>
<td>Education Index</td>
<td>0.05*</td>
<td>0.06</td>
<td>-</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>(0.04)</td>
<td>(0.06)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control of Corruption</td>
<td>-0.18</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(0.76)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freedom from Corruption (test)</td>
<td>-</td>
<td>-0.03^</td>
<td>-0.03*</td>
<td>-0.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.02)</td>
<td>(0.2)</td>
<td></td>
</tr>
<tr>
<td>GDP per capita (PPP)</td>
<td>0.56***</td>
<td>0.61***</td>
<td>0.59***</td>
<td>0.60***</td>
</tr>
<tr>
<td></td>
<td>(0.14)</td>
<td>(0.14)</td>
<td>(0.14)</td>
<td>(0.13)</td>
</tr>
<tr>
<td>Fiscal Freedom</td>
<td>-0.01</td>
<td>-</td>
<td>-</td>
<td>-0.01</td>
</tr>
<tr>
<td></td>
<td>(0.02)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top marginal tax rates (test)</td>
<td>-</td>
<td>-0.19*</td>
<td>-0.18*</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.12)</td>
<td>(0.12)</td>
<td></td>
</tr>
<tr>
<td>Regulatory Quality</td>
<td>-0.62</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(0.67)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business Freedom (test)</td>
<td>-</td>
<td>-0.001</td>
<td>-</td>
<td>-0.02</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.02)</td>
<td></td>
<td>(0.02)</td>
</tr>
<tr>
<td>Dependency Ratios</td>
<td>0.16***</td>
<td>0.26***</td>
<td>0.27***</td>
<td>0.16***</td>
</tr>
<tr>
<td></td>
<td>(0.04)</td>
<td>(0.06)</td>
<td>(0.06)</td>
<td>(0.04)</td>
</tr>
<tr>
<td>Government Effectiveness</td>
<td>1.13*</td>
<td>1.59**</td>
<td>1.60**</td>
<td>0.80^</td>
</tr>
<tr>
<td></td>
<td>(0.77)</td>
<td>(0.80)</td>
<td>(0.78)</td>
<td>(0.61)</td>
</tr>
<tr>
<td>Exports</td>
<td>0.76</td>
<td>0.53</td>
<td>-</td>
<td>0.75</td>
</tr>
<tr>
<td></td>
<td>(1.47)</td>
<td>(1.69)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.73**</td>
<td>0.54*</td>
<td>0.58**</td>
<td>0.83***</td>
</tr>
<tr>
<td></td>
<td>(0.31)</td>
<td>(0.32)</td>
<td>(0.31)</td>
<td>(0.29)</td>
</tr>
<tr>
<td>Adj. $R^2$</td>
<td>0.296</td>
<td>0.366</td>
<td>0.380</td>
<td>0.299</td>
</tr>
<tr>
<td>F-Stat</td>
<td>6.76</td>
<td>6.63</td>
<td>10.01</td>
<td>6.82</td>
</tr>
<tr>
<td>Degrees of Freedom</td>
<td>123</td>
<td>88</td>
<td>88</td>
<td>123</td>
</tr>
</tbody>
</table>

The first numbers are regression coefficients ($\beta$), while the numbers in parenthesis are standard errors.

*** Significant at 1% level
**  Significant at 5% level
*   Significant at 15% level
^  Significance at the 20% level

Sources: See Figure A.1 in Appendix A
Further Discussion

As previously stated, the apparent insignificance of the regulation, corruption, and tax burden measures in determining changes in informality within a country is unexpected. Given the rich history of literature supporting this connection, a truly insignificant relationship between these variables is highly unlikely. Instead, the changes which are brought about by shifts in these variables may not immediately take effect, filtering through the system in order to affect the informal economy. Individuals may have less trust in the government, making their actions a little more delayed than they would be with other explanatory factors. This combined with the short period of time (five years) during which changes are observed likely contributes to the low level of correlation between these variables and the informal economy. As none of the previous studies use first-differenced data in their tests of informality and its causal relations, these results are important in establishing that the relationship between these traditionally discussed causal variables and informality is not as straightforward as previous research suggests (Dreher & Schneider, 2006; Johnson et al., 1998; Loayza, 1996). What these findings do suggest is that there are other factors which may be just as, if not more, important in determining informality as those traditionally discussed.

While the relationship between exports and informality is also insignificant, the theoretical backing is not as strongly established, therefore this
finding is less puzzling. The insignificance of this relationship could indicate that the theorized effect of exports is counteracted by other effects. For example, informal businesses may supply cheap inputs which substantially lower the quality of the final goods, harming exporters in the long-run. This relationship could also indicate that an increase in exports causes businesses to hire additional formal labor to meet the rising demand for their product, exactly opposite to the response predicted. This does not change the fact that previous research indicates an increased number of exports creates many more informal jobs than formal ones (Marjit et al., 2007; Stallings & Peres, 2000). However, it is quite likely that these informal jobs generate very little money and are overshadowed by the formal jobs created which likely have a higher value added. This would still lead to a decrease in informal activity as measured by a percentage of the country’s GDP. These results could also indicate that exports are irrelevant to the growth of the informal sector. Further tests would have to be conducted in order to tease out the true relationship (or lack thereof).

Another surprising result of the previous tests is the unexpected direction of the relationship between many of the explanatory variables and informality, specifically the education index, government effectiveness, and dependency ratios. The positive correlation between higher numbers of working age individuals and informality indicates that more individuals of working age leads to a larger informal economy. This is in direct contrast with the theory that a
larger number of elderly or young would lead to an increased informal economy as they are expected to have a harder time finding employment in the formal sector (Perry et al., 2007). One possibility for this finding is that a larger number of working age individuals floods the job market, forcing many to enter the informal sector to survive. As for the education index, the assumption that individuals avoided regulations and taxes because they could not comply with them due to illiteracy or lack of understanding may be completely wrong. It is quite possible that it actually takes a higher skill level and understanding of the system to avoid laws and regulations than it does to comply with them. Finally, the correlation between high government effectiveness and the informal economy is a little harder to explain. It is possible that increases in government accountability lead to an influx of “start-up” informal businesses, as these business owners can be more secure in their ability to make a future profit when the government is following through on its promises. The theorized effect that individuals would escape the restrictive formal sector as governments become less effective may be a variable that occurs on a larger time scale and is therefore not capture in this test. It may take a jarring change in quality for a business to decide to leave for the informal sector. Given the extremely low level of statistical significance for both the education index and government effectiveness in this test, it is also likely that there is not relationship between the two variables at all.
The remaining explanatory variables, GDP per capita (PPP) and female labor force participation measure, reflect the predicted relationships with informality. As the literature suggests, an increase in gender equality is associated with a decrease in the amount of informal activity within a country, as women are able to enter formal businesses without facing the costs of breaking social norms (Mernissi, 1987). The labor force participation measure is an attempt to capture some measure of this inequality. GDP per capita (PPP) and the informal economy are negatively related, supporting the hypothesis that low-income individuals enter the informal sector out of necessity to survive, as a population with lower income is likely to have a larger informal economy (Huq & Sultan, 1991; Neef, 2002). As neither of these variables was much affected by the addition of the alternate tax burden measure, the relationship predicted by the first set of tests is not called into question. Finally, as was previously discussed, the practical significance of the relationship between the informal economy and both GDP per capita (PPP) and female labor force participation rates is fairly substantial.
Part V

Methods & Results: Consequences
The following section delves into the second part of testing the rational legalist model – focusing on the differences between those informal businesses which are starting-up and those which are evading government oversight. This section details the test which is set up to determine whether or not the hypothesis that these two types of informality have opposite effects on an economy’s growth is valid. Following a description of the methods employed is an in-depth discussion of the results and their significance.

Methods

Though the previous section was designed to determine the relevant determinants of informality, there are several intervening factors which must be considered in identifying the true causes of informality for the following tests. While the details of this are thoroughly discussed in the previous section, it is important to note that several variables found to be insignificant are likely to be significant after considering possible complicating factors, such as lack of lagged variables in the regressions. For the purpose of this section, significant determinants of the informal economy are: gender equality, age distribution of a population, tax burden, corruption, regulations, government quality, and poverty.  

39 While many of these variables were found insignificant in the previous section, there is a large base of literature which supports the theorized relationship. Regulations, tax burden, and corruption were the only variables kept despite their apparent insignificance.
After the relevant determinants of informality have been identified, the second step in testing rational legalist theory is to determine whether or not the effects of a conducive or restrictive business environment actually affect a country’s growth as theorized. As previously stated, this theory predicts that the size of a country’s informal economy will be positively correlated with growth when a conducive environment exists and negatively correlated when a restrictive environment dominates. In order to test this theory, an index composed of those explanatory variables found to be significant is created. This index is then used to divide countries into two groups, nations with an environment conducive to

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40 As information for more countries is available for the 2005 set of data, this set of tests is conducted with 2005 data. See Appendix B.4 for the list of countries used for this section and their classifications.
formal businesses and those in which the environment is inadvertently restrictive
to formality. Each variable determined to be significant, regardless of the
correlation coefficient, is indexed individually using Step One in Figure 5.1. This
ensures that each variable is measured on a scale of zero to one, removing the
problems created by using measures scaled differently. The equation used to
index the variables is the same equation used by the United Nations in the initial
steps of creating the Human Development Index (Human Development Reports,

![Figure 5.1: Indexing the Explanatory Variables](image)

**Step One: Index the Individual Variables***

Indexed Value = \[
\frac{actual\ value - minimum\ value}{maximum\ value-minimum\ value}
\]

**Step Two: Creating the Business Environment Index**

Country Score = \[Female\ Labor\ Force\ Participation\ Index + Regulatory\ Quality\ Index + Fiscal\ Freedom\ Index + Dependency\ Ratios\ Index + Control\ of\ Corruption\ Index + Government\ Effectiveness\ Index + GDP\ per\ capita\ (PPP)\ Index\] / [7]

* This is the same general equation used to calculate the Human Development Index.

2007). After each variable has been individually indexed, country scores are
created by adding up the indexed values of each explanatory variable and dividing
by seven, the total number of explanatory variables included. Finally, countries
are divided into two categories – those with conducive business environments and
those with restrictive business environments – based on the results of this index.
All countries scoring 0.50 or above were labeled conducive while those with scores below 0.50 are classified as restrictive. After this division is complete, the correlation between growth and the informal economy is examined to test the hypothesis. These statistics are looked at for the entire dataset as well as the differences in results between the restrictive and conducive groups to gain a better understanding of the changes brought about by separating the data. In this second set of testing, it is important to understand that the informal economy is now the explanatory variable while growth is the dependent variable.

Results

While the correlation between growth and the size of a country’s informal economy is not exactly as predicted, the information this test produces suggest that the theorized effect does play into the relationship on some level. The correlation between growth and informality is positive, but weak, when data from all countries, regardless of score on the environment index, are tested together. After countries are broken into their respective groups, both sets have positive correlations between growth and the size of the informal economy, though this relationship is much stronger in countries with good business environments. The relationship is practically non-existent in countries classified as having restrictive environments. The results of these tests are presented in greater detail below, along with scatter plots which display the relationship visually.
Before looking into the relationship between growth and the informal economy among the defined groups, it is important to understand the interaction between the two variables on a larger scale, testing all one hundred and twenty-four countries in the sample together regardless of their business environment score. This manner of testing found that the correlation between informality and growth is a weak 0.24. This relationship is demonstrated in Figure 5.2. As seen below, the relationship between growth and informality appears to be non-existent given the correlation when considering all countries together.

**Figure 5.2: Correlation of Growth and Informal Economy, All Countries**

Source: See Figure A.1
The next case to consider is that of countries with a restrictive business environment. According to the index discussed above, the majority of countries fall into this category. Eighty eight countries, listed in Figure B.4, are determined to have restrictive business environments. With a correlation coefficient of 0.06, these countries have an even weaker relationship between growth and informally than the set of pooled countries. While the correlation is positive, the relationship is so weak that this is not very important. As seen in Figure 5.3, this relationship is obviously insignificant.

![Figure 5.3: Correlation of Growth and Informal Economy, Restrictive Countries](image)
Finally, the relationship between growth and informality in those countries with a conducive business environment is tested. Though there are a smaller number of countries included in this group, only thirty six, it is important not to lower the bar of a 0.50 rating to be classified as a conducive merely to make the two groups more balanced. This relationship is both strong and positive, with a correlation of 0.62, exactly as predicted by the theory. As shown in Figure 5.4, the strength of this correlation is visually obvious, in strong contrast with the results both previous tests.

Figure 5.3: Correlation of Growth and Informal Economy, Conducive Countries

36 Countries

Source: See Figure A.1
Further Discussion

The results of these tests support the hypothesis that there are two types of informality which effect growth in different ways. As previously discussed, the informal economy encompasses a variety of activities so the idea that this sector is comprised of a variety of activities which have varied effects on a country’s development is not a new one (Williams & Round, 2007). Though the correlations are not exactly what rational legalist theory predicts, with the only significant correlation between growth and informality existing between those countries with a conducive business environment, this alone is noteworthy. The relationship itself is very strong, especially in comparison with the extremely weak correlation among the variables when testing countries with a restrictive business environment or even among all countries in the group. While the theory predicted that businesses evading the costs of formality would decrease growth within the country, it is possible that these businesses do not affect growth at all. As many of them may have been contributing very little to the GDP before leaving the formal economy, the existence of businesses evading formality appears to an unimportant factor to the country’s economic growth.

However, the data also suggests that those businesses entering the informal economy with plans to eventually formalize are important to the growth

41 While the results of this test are encouraging, it is important not to overstate their meaning. The use of simple correlation coefficients means the results are not as strong as those presented in the previous chapter as correlation coefficients do not control for extraneous variables which may also affect the relationship.
of a country’s GDP. The significant shift of correlation strength when looking at only those businesses with conducive environments suggests that this relationship is more than just chance. This finding will come as no surprise to the researchers in the field who have long been advocating that governments should shift their focus from punishing those in the informal economy to reworking the incentive structure so that these businesses will move to the formal economy on their own (Williams, 2005; Williams, 2006; Williams & Round, 2007).
Part VI

Conclusion: Final Thoughts
After an extensive review of the literature and thorough testing, it appears as though the data does not support its theoretical backing. However, this is not the case. What the data does point to is the need for inclusion of variables beyond those traditionally discussed by legalist theorists in future models of informality. Rational legalist theory is correct in calling for this addition, even though the correlations were, in some cases, not predicted by the theory. Given these outcomes, there are obviously several directions that future research could take.

This final section of the study will briefly review the results of performed tests in the context of what was predicted and make suggestions for future research. The practical importance of these results is also addressed.

Rational legalist theory has two different branches, the first of which deals with determining the causes of informality. Using this framework, several explanatory variables not used in research based on legalist theory alone are introduced in this study, such as gender equality, exports, age distribution, and education. The regressions performed indicate that both female labor force participation and a country’s dependency ratios play significant roles in the size of its informal sector. Female labor force participation is negatively correlated with informality, indicating that increased inequity leads to an increase in informal activity, as predicted. Surprisingly, a population with a large dependency ratio (more dependents than individuals of working age) is found to have less informal activity than those nations with more individuals of working age. This contradicts
the hypothesis that large numbers of dependents would find refuge in the informal sector in order to help support their families. The education index and government effectiveness measure were found to have borderline statistical significance, with relationships opposite those predicted. This could be the result of several factors. First of all, this set of tests focused on those variables predicted to cause evasive informal activity as it is this type of informality which is expected to harm a country’s development. If a given variable has opposite effects on each type of informal activity, this could lead to biased results. Finally, exports are found to be insignificant. These findings are an important step in supporting rational legalist theory – they back up the hypothesis that individuals take multiple factors into account, not simply burdens placed upon them by the state, when determining whether to formalize or enter the informal sector.

The surprising results of these tests suggest that the measures that quantified corruption, taxes, and the regulatory system are unrelated to the individual’s choice to enter informality. As previously discussed in greater detail, this directly contradicts a large base of previous literature, suggesting that additional factors are at work. There are several possible explanations for this discrepancy, from lack of variation in the observations to the short time over which changes are observed. This study does not attempt to imply that these traditional explanations of informality are no longer important but merely to
assert that there are other factors that are just as, if not more, significant than these traditional explanations.

The second part of rational legalist theory draws on the legalist assumptions of the informal economy, suggesting that under different circumstances informality can affect growth in different ways. The results in this section, while not entirely as predicted, suggest that countries with a conducive business environment have informal economies which tend to be supportive of growth. While countries with restrictive environments do not have the negative relationship between informality and growth predicted, the relationship is not significantly positive either. This suggests that, though the theory is not perfect, it does capture an important aspect of the informal economy – there are different types of informality which affect a country’s development in different ways.

Using the example from the introduction, the Peruvian tailor who left the informal economy would be doing very little to harm her country’s growth, though the second tailor who entered the formal sector after building a clientele in the informal sector would be a true asset to helping the economy’s growth.

Given these findings, it seems that a further refinement of rational legalist theory is necessary for future studies. The first part of the theory remains intact – the data backs up the hypothesis that individuals take into account a variety of factors before entering the formal sector. That said, once the information is available, tests of these relationships over a longer period of time will be essential.
to provide further support. This detailed data will also be vital in testing the relationship of the traditionally legalist explanations of informality, such as tax burdens and regulations. It is the second part of rational legalist theory that requires a small alteration. This section of the theory rests on the assumption that businesses evading formality negatively effect a country’s growth. But given the results above, it seems that businesses evading formality have little to no effect on growth at all. That said, this type of informality still comes at the high cost of lowered tax revenue, distorted national statistics, and other issues discussed in detail within the theory chapter (Bajada & Schneider, 2005a). A revised rational legalist theory would predict that countries with conducive business environments will find that the informal sector provides an engine for growth while those with restrictive environments will not be able to realize these benefits. Future studies should also examine the differences among these types of informal business. Are the benefits provided by start up businesses negated by the costs? Do businesses evading detection affect a country’s development in other ways? Perhaps the most effective way to answer these questions would be to conduct case studies focused on countries with highly varied business environments in order to tease out the more nuanced effects. Though these are all interesting questions that must be considered in order to recommend sound policies directed at informal activity, they are beyond the scope of this paper.
The findings of this study have implications for future policy in developing and developed countries alike. Since most of the countries classified as having a restrictive environment are located in the developing world, these results confirm what has long been understood by researchers of development: economic growth requires more than simply changing the laws within a country. These changes must be accompanied by other, less tangible, improvements in order to have substantive effects. The same is true in discussions of informality. In order to enhance the start-up sector within the informal economy, a country must accomplish more than mere reductions in its tax burden – improvements in gender equality are also important to the process. As for countries with conducive business environments, these results suggest that punishing informal businesses may not be the most effective growth strategy. As informality seems to serve as a kind of business incubator, these countries might be better served concentrating on easing the process of formalization.
Part 7

Appendices
# Appendix A: Describing the Data

## Figure A.1 Data Sources

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<th>Variable</th>
<th>Indicator</th>
<th>Source</th>
</tr>
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<td>Schneider, 2007</td>
</tr>
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<td>Gender Equality</td>
<td>Labor Force Participation Rate, female</td>
<td>World Development Indicators</td>
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<td>Education Index</td>
<td>Human Development Reports - UN</td>
</tr>
<tr>
<td>Corruption</td>
<td>Control of Corruption</td>
<td>World Governance Indicators</td>
</tr>
<tr>
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<td>World Development Indicators</td>
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<td>Heritage Foundation</td>
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<td>Dependency Ratio</td>
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<td>Government Effectiveness</td>
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</tr>
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**Figure A.2 Descriptive Statistics, Full Data Set**

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<th>Std. Deviation</th>
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* All variables include data from 2000 and 2005 except GDP growth (which is only 2005 data).
**Figure A.3 Descriptive Statistics, Differenced Data**

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* Variables indicate the differenced data set, with the country’s observed value at 2000 subtracted from the country’s observed value at 2005.*
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**Observations:** 124 Countries

Source: See Figure A.1
### Figure A.5: Correlation Coefficients for Figure 4.3

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Inf = size of the informal economy  
Qual = government effectiveness  
edu = education index  
reg = regulatory burden  
Gen = female labor force participation  
tax = fiscal freedom  
cor2 = freedom from corruption  
ex = exports  
pov = GDP per capita (PPP)  
age = dependency ratios

Observations: 89 Countries  
Source: See Figure A.1
## Appendix B: Countries in the Data Set

### Figure B.1: Countries in Main Data Set

*124 Observations*

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The countries listed above are those observations which had to be dropped from the main data set because information was unavailable for one or more of the explanatory variables in both 2000 and 2005. Fortunately, there are not many observations that had to be dropped initially, making the problem of inadvertent bias highly unlikely.
The countries listed above are those which had to be dropped for the test data set due to the lack of data points in the information complied by the Fraser Institute. The loss of so many countries from the data set appears to bias the data, as seen in the altered correlation coefficients in Figure A.4 as compared to those in A.3 (from countries using the same measurement, just a different number of observations).

Figure B.3: Countries Dropped for Test Data Set
35 Observations

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**Figure B.4: Classifications for Part V Results**

### Restrictive Business Environment

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### Conducive Business Environment

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References


MacEwen Scott, A. (1979). Who are the self-employed? In R. Bromley, & C. Gerry (Eds.), *Casual work and poverty in third world cities* (pp. 105). Chichester: John Wiley and Sons.


countries (pp. 23). Paris: Development Centre of the Organization for Economic Cooperation and Development.


