

TRUST, RULE OF LAW, AND NEW FIRM FORMATION

Michael Troilo
The University of Tulsa
College of Business Administration
800 Tucker Avenue
Tulsa, OK 74104
(918) 631-2998
mike-troilo@utulsa.edu

Abstract

Entrepreneurship is key for economic growth, yet comparatively little research has examined the relationship between institutions and new firm formation. I test the impact of trust and rule of law on new firm formation using the Global Entrepreneurship Monitor (GEM) survey data for 2001-2003. I find that both trust and rule of law are significant for starting firms that expect to create 20+ new jobs in 5 years, my proxy for Schumpeterian entrepreneurship. This finding counters prior literature that suggests that rule of law and trust are significant for all forms of entrepreneurial activity.

Keywords: *institutions, entrepreneurship, trust, rule of law, property rights, Schumpeter, Kirzner*

1. INTRODUCTION

According to the Kauffman Foundation over a half-million businesses are started each month in the United States.¹ In Singapore, almost 4,000 new high-tech businesses commenced in 2004.² Why do countries vary not only in the amount of entrepreneurship but also in the types of entrepreneurial activity pursued?

In the entrepreneurship literature individual characteristics have been emphasized for entrepreneurial behavior while the business environment has received comparatively little attention. This paper focuses on the latter by examining the impact of institutions on entrepreneurial activity type, where institutions are broadly defined as humanly devised constraints on human interaction. It is these constraints, and the protection they offer to new firms, which is the crux. Institutions may be considered as formal, such as property rights and rule of law, or informal, such as trust (North, 1990). Institutions matter for both new and ongoing businesses because they generally reduce uncertainty over the long term and lower transactions costs (Coase, 1960; North, 1990; Williamson, 1985).

¹ Kansas City Business Journal, September 22, 2005: *Kauffman study: Number of new businesses rises*. Accessed on-line at <http://kansascity.bizjournals.com/kansascity/stories/2005/09/19/daily31.html> 3/14/06.

² MediaCorp News, January 24, 2005: *Singapore attracted 3,664 new high-tech businesses last year*. Accessed on-line at <http://www.channelnewsasia.com/stories/singaporebusinessnews/view/128872/1/.html>

I will refer to entrepreneurial activity as new firm creation, and I will also consider the motivation of the entrepreneur in creating the new firm and the type of opportunity pursued. An individual may be motivated to become an entrepreneur either to pursue a business opportunity or because of economic necessity (Reynolds, 2003). The type of opportunity pursued may either be Schumpeterian (1934) or Kirznerian (1973; 1997), where the former refers to a more radical innovation in process or technology than the latter and is consequently much rarer.

Entrepreneurs who pursue business opportunities both enrich themselves and increase social welfare more than those who become entrepreneurs out of necessity; likewise, Schumpeterian opportunities enjoy more growth potential than Kirznerian opportunities.³ These activities are higher-growth-potential (HGP) because they generally result in more productivity, job creation, and technological innovation than their counterparts. Although not all HGP opportunities are Schumpeterian, all Schumpeterian opportunities are HGP. For this reason I use these terms, HGP, and Schumpeterian, interchangeably. Because of the impact these HGP entrepreneurial activities have on economic growth they merit further study.

While the positive effect of entrepreneurship on economic development is well-established (Acs, 1992; Boettke and Coyne, 2003; Oviatt and McDougall, 1994), and the importance of institutions to entrepreneurship has been theorized (Baumol, 1990; Harper, 2003; North, 1990), the connection between institutional type and entrepreneurial activity type has scarcely been examined. The first contribution of this paper will be to address this gap in the literature; specifically, for what types of entrepreneurial activity do rule of law and trust matter? My argument is that rule of law, and to a lesser extent, trust, do matter for those entrepreneurs

³ In saying this, I am assuming that the outcome of exploiting a Schumpeterian opportunity is successful. Given that both a Kirznerian entrepreneur and a Schumpeterian entrepreneur exploit their respective opportunities, we would expect to see more productivity, social welfare benefits, and personal wealth benefits from the latter.

risking the most: the Schumpeterian entrepreneurs. Where entrepreneurs are risking little, the absence of either rule of law or trust is less of a constraint.

Second, although the existence of country-specific institutional profiles has been offered (Kostova, 1997) and the ramifications of such profiles for entrepreneurship suggested (Busenitz, Gomez, and Spencer, 2000), few specific hypotheses about the relationship between a country's institutions and its overall level of entrepreneurship have been tested.⁴ The paper's next contribution is to offer empirical evidence for this relationship. It is hoped that the results will enable policymakers to strengthen key institutions for continued economic growth, and to indicate to both investors and entrepreneurs what institutional environments are more conducive to new firm formation.

The last two contributions are methodological. The first is the use of Guiso, Sapienza, and Zingales' approach for measuring the impact of culture on economic outcomes (2003, 2006) to study new firm formation. While Guiso, et al. do apply their methodology to the self-employed, my application is more nuanced in that it considers both the motivation and the type of opportunity the entrepreneur is exploiting. The second contribution is to extend the model developed by Rajan and Zingales (1998) to the entrepreneurship literature. This model isolates the effect of a given institution on new firm formation more completely than is found in most cross-country studies of entrepreneurship.

I analyze the links between institutional type and entrepreneurial activity type using the Global Entrepreneurship Monitor (GEM) survey data for the years 2001-2003. The dependent variable is the level of entrepreneurial activity (starting a firm) by country/industry pair, which I

⁴ Henrekson (2003) examines the effects of the institutional arrangements of the welfare state (high taxes, government subsidies for healthcare, etc.) on entrepreneurial activity. He finds that these institutional arrangements are not conducive to entrepreneurial activity, although he adds the caveat that his analysis is exploratory. His paper is probably the closest in spirit to this paper, in that he also considers entrepreneurial motivation (opportunity v. necessity).

estimate with a linear regression model. The key independent variables are rule of law and trust⁵, which proxy the importance of formal and informal institutions, respectively.

This paper is organized as follows. I first discuss various theories connecting entrepreneurship and institutions and propose hypotheses. Next, I describe the data and the methodology for testing the hypotheses. I then offer results. Discussion, including avenues of future research, concludes the paper.

2. ENTREPRENEURSHIP: OPPORTUNITIES, ACTIVITIES, AND APPROACHES

One of the major issues of studying entrepreneurship is simply defining it. One generally accepted definition is that entrepreneurship is an activity that involves the discovery, evaluation, and exploitation of opportunities to introduce new goods and services, ways of organizing, markets, processes, and raw materials through organizing efforts that previously had not existed (Shane and Venkataraman, 2000; Venkataraman, 1997). This definition is theoretically pleasing because it is broad enough to incorporate almost all conceivable aspects of entrepreneurship. As Shane (2003) notes, however, it is difficult to operationalize. For the purposes of this paper, I define an entrepreneur as “one who owns, launches, manages, and assumes the risks of an economic venture” (Greve and Salaff, 2003: 3). This definition is consistent with prior literature, can be readily operationalized, and is sufficiently broad to allow inclusion of what Shane (2003) terms the two main entrepreneurship activities: new firm formation and self-employment.

Given this definition, my focus is individual actors. I make no attempt in this paper to capture any aspect of corporate entrepreneurship. Although certainly existing companies

⁵ I treat trust as an endogenous variable, which I explain further in the methodology section. In short, I want to measure that portion of trust that is a value passed from generation to generation. There are other factors that may influence whether people trust others or not, i.e. a regime where individual privacy is valued as a human right v. a regime that encourages citizens to spy on one another. I seek to isolate trust that is a learned value.

engage in entrepreneurial activity via innovation, speculation, and arbitrage, such activity is beyond the scope of this paper; moreover, my data does not allow measurement of corporate entrepreneurship.

It is useful to distinguish between those entrepreneurs who seek opportunities as opposed to entrepreneurs who become entrepreneurs because they have no alternative for income because motivation can impact the growth potential of entrepreneurial activity. Some individuals are “pulled” into entrepreneurship because they see a chance to profit themselves, while others are “pushed” into entrepreneurship by unemployment or poverty (Storey, 1994). The phenomenon of unemployment spurring entrepreneurial activity has been oft-studied; recent papers offering empirical evidence include Mesch and Czamanski (1997), Ritsila and Tervo (2002), and Taylor (2001). Reynolds (2003) has characterized the former as “opportunity entrepreneurs-willing volunteers in the war for economic growth”, while the latter are “necessity entrepreneurs-the reluctant draftees in the war”.

Not all opportunities are identical. Shane (2003) describes two broad types: Schumpeterian (1934) and Kirznerian (1973; 1997). The Schumpeterian opportunity corresponds to the popular imagination of entrepreneurs and entrepreneurship. It involves radical change and demands innovation and creation, either bringing an entirely new market into existence or enhancing an existing market in a significant way. As such, these types of opportunities are rare, and when they occur their effects are disequilibrating on current markets and perhaps even on society. An example of a Schumpeterian opportunity is the personal computer, specifically the MacIntosh invented and produced by Steve Jobs, Steve Wozniak, and Apple Computer. Schumpeterian opportunities specifically involve innovation, but because

they are also tend to create firms characterized by high job creation and global operations they are used synonymously with HGP opportunities.

Kirznerian opportunities are more modest and more plentiful. They are based on discovery (Kirzner, 1973; 1997) not invention, and rely on differential access to existing information. It is not mere information asymmetry because prior to the discovery of the opportunity that opportunity was simply unknown, whereas information asymmetry involves information that can be known by both parties but is only known to one (Kirzner, 1997).

Activities involving Kirznerian opportunities include arbitrage and speculation. Their effects are equilibrating on existing markets and incremental with respect to change. An example of a Kirznerian opportunity is opening a new restaurant in a city; the proprietor expects to profit through some minor differentiation from competitors in the fare offered, service, location, or a combination of these factors.

Most entrepreneurship research has focused on individual characteristics as opposed to the business environment to explain entrepreneurial activity. The personal characteristics outlook highlights several prominent factors for increasing entrepreneurial behavior such as being relatively young (Rees and Shah, 1986; Reynolds, 1997), male (Bates, 1995; Blanchflower and Oswald, 1998), married (Delmar and Davidsson, 2000; Schiller and Crewson, 1997), willing to bear uncertainty (Kihlstrom and Laffont, 1979; Knight, 1921), and needing achievement (Baum et al., 1993; Busenitz and Barney, 1997; McClelland, 1961). The environment approach underscores technological change (Tushman and Anderson, 1986), market structure (Acs and Audretsch, 1990), industry dynamics (Hannan and Freeman, 1987) and institutions (Baumol, 1990; Harper, 1997; 2003) as catalysts for entrepreneurship. When referring to the business environment in this paper I am focusing on institutions.

In terms of social welfare, entrepreneurial activity can either be described as productive, unproductive, or destructive (Baumol, 1990). Baumol's argument, which emphasizes the importance of institutions, asserts that while the total supply of entrepreneurs varies among societies, the productive contribution of the society's entrepreneurial activities varies much more because of the allocation of entrepreneurial energy. Depending on the institutions (i.e. "rules of the game") in a society, entrepreneurs may focus more time on productive activities like innovation v. unproductive activities like rent-seeking or crime. This paper concerns itself with all types of new firm creation, as I lack the data to differentiate among productive, unproductive, and destructive entrepreneurial activity across countries.

3. INSTITUTIONS AND ENTREPRENEURSHIP: TRUST, PROPERTY RIGHTS, AND RULE OF LAW

Hodgson (2006: 2) defines institutions as "systems of established and prevalent social rules that structure social interactions". This broad definition encompasses self-enforcing coordination devices such as language as well as externally enforced constraints such as contract law. Institutions may arise organically as the equilibrium of a repeated game (Greif, 1994) or be the product of design (Weingast, 1989). Institutions can both enable behaviors and constrain them; the focus here is on institutions as "humanly devised constraints on human interaction" (North, 1990: 3).

Institutions support entrepreneurship in two fundamental ways. The first way is by legitimizing entrepreneurial activity. Legitimacy with regard to entrepreneurs and institutions refers to the process by which key stakeholders, the general public, key opinion leaders, and government officials accept a venture as appropriate and right, given existing norms and laws (Aldrich and Fiol, 1994). Adherence to the "rules of the game" makes an entrepreneur

legitimate; the payoffs associated with these rules determine whether the entrepreneurial activity will benefit society or detract from it (Baumol 1990). Legitimacy enhances a new venture's prospect of survival by easing the process of acquiring key inputs. Legitimacy of entrepreneurial activity also signals to nascent entrepreneurs that they are free to imitate successful, established entrepreneurs (DiMaggio and Powell, 1983).

The second benefit is protection against expropriation of rents. Cooperation among economic actors is difficult to sustain when there is a finite game, when there are a large number of players, and when information about the other players is lacking (North, 1990). The complexities of interaction in these circumstances give rise to opportunistic behavior, which increases the costs of transactions. Institutions can operate as constraints on such behavior and consequently lower transaction costs. They can function as intermediaries between the entrepreneur and the sources of inputs (Casson, 1995). From the entrepreneur's point of view institutions serve to decrease the likelihood of expropriation of rents from their labor and ingenuity (McMillan and Woodruff, 2002).

Institutions offering protection against expropriation of rents can either be formal or informal (North, 1990; 1994). Formal institutions are codified in law; they carry the weight of legal sanctions. Informal institutions are grounded in the norms and values of a society and mechanisms such as ostracism provide enforcement. The difference between formal and informal institutions is one of degree rather than of kind. Institutions exist on a continuum of unwritten to written; from a simple society to a complex society (North, 1990). Informal institutions may be the basis of formal institutions; formal rules may complement informal constraints and can increase their effectiveness. Primary examples of the former are rule of law and property rights, while trust exemplifies the latter.

According to North, the origin of informal institutions is socially transmitted information. These informal constraints are a part of the heritage we call “culture”. Informal constraints are a society’s initial attempts at solving coordination and exchange problems. People follow norms of trust and reciprocity in their transactions because ultimately it is more beneficial for both the individual and the society to do so, i.e. there will be a larger economic surplus to share. Those who behave irrationally, that is, those who calculate erroneously that the cost of breaking the norm is less than the benefit of obeying it, will not survive long in the economy.⁶

Trust is a function of economic transactions embedded in social relationships (Granovetter, 1985). It can be defined as “the subjective probability with which an agent assesses that another agent or group of agents will perform a particular beneficial action” (James, 2002: 292; Gambetta, 2000). When few people can be trusted, transaction costs tend to be very high (North, 1990; Casson, 1995). Higher transaction costs dissuade nascent entrepreneurs from starting new ventures, *ceteris paribus*. For example, an entrepreneur may have a “gentlemen’s agreement” with a supplier to supply a given quantity of inputs at a given price in a given high-trust economy. If there is performance as agreed then the transaction costs associated with the supplier are relatively low. In a low-trust economy, however, it is necessary for the entrepreneur to sign a contract with the supplier; otherwise she is vulnerable to the supplier’s non-performance. At a minimum she will incur the cost of retaining legal counsel to draft a contract. Such costs may dissuade her from starting the business in the first place in the low-trust economy. The most important attribute of a business culture for entrepreneurial activity is the extent to which it promotes trust (Casson, 1995).

⁶ There is inherent in this notion of trust a sense of self-interest in being trustworthy. Williamson (1993) speaks of this as “calculativeness” as opposed to trust; however, he also admits the possibility of institutional forms of trust, e.g. societal-trust. Such forms of trust describe the context of transactions and still retain calculative in nature; i.e. people calculate that it serves their interests to honor their agreements.

With regard to empirical studies Guiso, Sapienza, and Zingales (2006) use 2SLS regressions to study the effects of culture on values like trust and the subsequent effect of these values on various economic outcomes such as the probability of becoming an entrepreneur. The dependent variable is self-employment and the independent variable of interest is trust. In all three different models they use, they find that trust has a positive, significant effect on the likelihood of being self-employed.

Enforcement of norms becomes increasingly costly as the number of actors in the economy grows. Opportunism is more likely as increasingly unrelated parties transact business. Application of norms becomes more difficult as the transactions become more complex. At some point the actors in the economy decide that the benefit of codifying norms and sanctions and providing for their enforcement outweighs the costs of doing so. This is the genesis of formal institutions. In general, greater economic complexity prompts the development of formal institutions, but the impossibility of accounting for all contingencies in a contract between two parties can also lead to informal mechanisms for enforcement (Williamson, 1985).

Formal institutions range from general rules to particular specifications and are the consequence of bargaining by various rival constituencies within a polity (North, 1990). They encompass constitutions, statutes, common law, specific bylaws, and contracts. In North's view the political order spawns the economic order, although causality flows in both directions. He further notes that the Coasian idea of efficiency, zero transaction costs, is non-existent in an economy and impossible in the polity; hence a cost-benefit analysis occurs to develop institutions. The progress of moving from informal constraints to formal constraints is not inevitable, as the current state of many developing nations shows.

Two formal institutions of particular importance to entrepreneurs are property rights and rule of law (Boettke and Coyne, 2003; Gwartney, 1999). These institutions are paramount because other formal institutions find their basis in them, and they tend to co-exist and complement one another. Bank loans for new businesses, for example, would likely become scarce if property rights were either not articulated or not enforced, and the state could arbitrarily seize assets.

There are two overlapping benefits to property rights for entrepreneurial activity. The first is that the institution of private property allows the entrepreneur to benefit from her investment in the business. As Rodrik (2000) notes, “it stands to reason that the entrepreneur would not have to incentive to accumulate and innovate unless s/he has adequate *control* over the returns to assets s/he creates” (italics his). He emphasizes that it is control over property, rather than ownership of property per se, that is the key.

The second benefit involves gains from trade that arise from transferring resources by mutual consent. In Harper’s words, “property is alienable. Property rights allow people to separate themselves from the output of their labor, so that they are not bound to consume what they produce. This is essential for the entrepreneurial processes involved in market coordination and creation” (Harper, 2003: 75).

The institution of property rights poses a conundrum (Weingast, 1995). On the one hand, the state must be strong enough to guarantee property rights. On the other hand, the any state strong enough to guarantee these rights also could use its power to confiscate property arbitrarily. The solution, according to Weingast, is a “credible commitment” on the part of the state not to act in an arbitrary fashion; a written constitution exemplifies this commitment and sets in motion due process and rule of law (ibid). Rule of law and property rights, while not

equivalent concepts, do tend to exist simultaneously in practice and hereafter when I refer to rule of law I'm including property rights as well.

Rule of law involves three components that form the universality of the law (Harper, 2003; Hayek, 1960): certainty, generality, and equality. Certainty means that the law is stable over time; there are no sudden changes, especially retrospective ones. This allows for individuals and businesses to engage in long-term planning. Generality refers to law that can be applied without arbitrary discretion. Equality means that the law applies to everyone.

Although papers examining institutional effects on entrepreneurship are scarce relative to those studying personal characteristics of entrepreneurs, there exists some empirical evidence linking rule of law and property rights to increased entrepreneurial activity. Desai, Gompers, and Lerner (2003) analyze institutions and entrepreneurial activity in Europe and find that there is more entrepreneurship in less corrupt countries and in countries with better property rights.⁷ Their proxies for entrepreneurial activity were firm entry rates, firm size, and firm age: greater entry, smaller size, and younger firms indicated increased entrepreneurship. Johnson, McMillan, and Woodruff (2002) study small manufacturing firms in Eastern Europe; they find that weak property rights and legal systems discourage entry of new firms. They infer this finding from the fact that established companies in countries with weak rule of law and weak property rights tend to earn much higher after-tax profits than established firms in countries with strong versions of these formal institutions. Weak rule of law is a barrier to entry for new firms, thus allowing existing firms to earn much higher profits than would be possible with more competition. Pissarides, Singer, and Svejnar (2003) offer contradictory evidence. In their study of small and medium enterprises in Russia and Bulgaria, they find that insecurity of property rights is not a

⁷ The caveat to this finding is that Desai, et al. (2003) only consider firms with at least 20 employees. Entrepreneurial activity involving firms below this threshold is not counted.

constraint, but that financing is the major constraint of entrepreneurs operating in these countries. This suggests that rule of law may not matter for all types of new firm formation, especially if little in the way of assets is being risked to start the new firm.

With regard to the relationships among rule of law, trust, and new firm formation, it is important to recognize the tradeoffs involved (Peng, 2003). Rule of law, by virtue of the threat of legal sanction, provides more protection for nascent businesses than trust, but it involves more direct cost than trust.⁸ This is true at both the societal and the individual level; at the societal level the drafting of constitutions and statutes, training and maintenance of a judiciary, and provision for law enforcement requires tremendous expenditure of time and tangible resources. For an individual, it has already been offered that it is a less expensive proposition for an entrepreneur to deal with a supplier on the basis of a handshake than to have to resort to contracts and their enforcement in courts.

It would stand to reason, given this cost-benefit tradeoff, that we would see Schumpeterian entrepreneurs be more reliant on rule of law than on trust for starting their businesses compared to Kirznerian entrepreneurs. Schumpeterian entrepreneurs tend to be empire-builders and have more at stake than their Kirznerian counterparts. They therefore require the greater protection afforded by rule of law, despite the greater cost. This is not to say that trust has no impact on levels of Schumpeterian entrepreneurship; on the contrary increases in trust should have a positive impact. This is due to the fact that even formal institutions cannot account for all contingencies an entrepreneur will face when starting her business, so informal

⁸ I am speaking here primarily of initial costs. As North (1990) argues, the benefits of formal institutions must ultimately outweigh the costs of their formation or they wouldn't take root. In the short term, it is more costly to establish and access formal institutions than informal institutions, but in the long term formal institutions pay for themselves by constraining behaviors such as asset expropriation and property crimes.

mechanisms like trust will still have some significance. Based upon this reasoning I propose the following hypotheses:

***H1:** Increases in both rule of law and trust will have a significant, positive effect on levels of Schumpeterian entrepreneurial activity.*

***H2:** Increases in rule of law will have a more significant, positive effect than increases in trust on levels of Schumpeterian entrepreneurial activity.*

For overall levels of entrepreneurship, though, rule of law will probably not have much impact. Schumpeterian entrepreneurs are a small fraction of all entrepreneurs; most people don't have the desire to become empire builders. The typical entrepreneur, even one who is starting a firm out of a desire to do so rather than necessity, typically only wants to employ herself and perhaps a few other individuals. Given the cost associated with accessing the legal system, rule of law will therefore have little effect on overall levels of new firm formation and on levels of opportunity entrepreneurship.

See Figure 1. This diagram illustrates the relationship between new firm formation and rule of law. As rule of law gains in strength it promotes more entrepreneurial activity. The ascending line represents the state of developing countries, almost all of which have rule of law lower than 4 on a 5-point scale. Increasing rule of law in this context would have a significant marginal effect on the number of new firms started; however, there still exists a baseline level of small-scale entrepreneurship in these countries despite weak rule of law.

This intuition corresponds with anecdotal evidence I have gathered from discussions with entrepreneurs from China. Often they remark how much more they could do with their new businesses if only they operated in a legal environment like the U.S. or Western Europe. Weak rule of law is a constraint for them.

The line flattens near the score of 4 for rule of law. This is the state of most of the developed world. Small changes in the level of rule of law would have little or no effect on new firm formation, because it is not a constraint for entrepreneurs. Looking at the graph one can see that 4 is the optimal level for rule of law on entrepreneurial activity.

Anecdotal evidence from discussions with U.S. entrepreneurs corroborates this notion. American new business owners talk about the need for financing, not rule of law, as their chief constraint. They take it for granted that protection against expropriation of rents exists for their new firms; it is just part of the landscape in which they operate.

Beyond the peak there are detrimental effects for new firms; there is “too much” rule of law. This represents the situation of the Scandinavian countries, which have excellent scores for rule of law but lag other developed nations in entrepreneurial activity. The legal system is transparent, but excessive regulation stifles initiative⁹. As a consequence, the relationship between changes in rule of law and new firm formation is negative because of increased correlation between rule of law and regulatory burden.

While changes in rule of law will have zero or negative effects on overall and opportunity levels of entrepreneurs, trust should have a positive effect. Because of the cost-benefit tradeoff mentioned previously, Kirznerian entrepreneurs will rely on trust for protection against expropriation of rents. I therefore hypothesize the following:

⁹ The relationship between rule of law and regulatory burden is deserving of further study. Desai et al. (2003) found that rule of law had little effect on entrepreneurial activity in Western Europe, despite the well-developed legal systems in those countries, because of the onerous regulations for starting new firms. Henrekson (2003) studies entrepreneurship in Sweden and finds that the welfare state regulations dampen rates of new firm formation. In my data out of 29 countries for the year 2001, Norway ranks 15th, Finland 21st, Sweden 22nd, and Denmark 25th for rates of Total Entrepreneurial Activity (TEA).

H3: Increases in rule of law will have positive effects for overall levels of entrepreneurial activity and opportunity entrepreneurial activity up to a point, then have no effect or become negative.

H4: Increases in trust will have a significant, positive effect on levels of opportunity entrepreneurial activity and overall entrepreneurial activity.

4. DATA AND METHODS

4.1. Data

The main source of the data for the dependent variables is the Global Entrepreneurship Monitor (GEM), which has been systematically researching entrepreneurial behavior around the world since its inception in 1997. There are two distinct databases that GEM produces: the Adult Population Survey (APS) and the Expert Questionnaire. This paper uses the APS for the years 2001-2003 to construct the dependent variables. The APS encompasses approximately 78,000 individuals across 29 countries in 2001, 117,000 individuals across 37 countries in 2002, and 103,000 individuals across 32 countries in 2003.

Multi-national commercial survey research firms selected a random sample of adults for each country to administer the APS. The questions were standardized across countries and translations checked for accuracy. Overall demographic characteristics for each country's survey sample, such as gender, age, etc. were compared to that country's official statistics for the population. In cases where the official estimates were more reliable the sample was adjusted with weights so that the sample matched the population. A complete description of the techniques used can be found in the GEM Operations Manuals for the relevant years.

The APS is the source of the Total Entrepreneurial Activity (TEA) variables, both overall and by type such as opportunity entrepreneurship v. necessity entrepreneurship and

Schumpeterian entrepreneurship v. Kirznerian entrepreneurship. An initial screening interview was used to sort the respondents into four categories: 1) nascent entrepreneurs, 2) new firm owners, 3) informal investors, and 4) others, typically employed by a firm. The first two categories are versions of entrepreneurial activity. All respondents then were asked to answer another series of questions based on their responses to the screening interview.

There are several databases for the independent variables. For the informal institutional variable of trust, the World Values Survey (WVS) for the 1999-2001 wave was used to estimate this variable. The WVS contains almost 119,000 observations spanning 81 countries. The relevant information in the WVS for this paper is people's attitudes regarding trust as well as their religious upbringing and activity, which is described in more detail below. The Economist Intelligence Unit (EIU) Country Data and Market Indicators is the source of the formal institutional variables of rule of law and property rights. The EIU collects vital economic and political statistics for countries around the world on an annual basis. The International Labour Organization (ILO) Labor Statistics Database provides a key control variable: percentage of employed by industry by country in year 2000.

The unit of analysis is the level of entrepreneurial activity for a given industry¹⁰, country, and year. Regions within countries, such as Scotland, Wales, and Shenzhen, were dropped from the database.¹¹ Additionally, country-years where the industry data was not available for the vast majority of the entrepreneurs were not used; these country-years include Australia for 2002 and the U.S., Netherlands, France, and Italy for 2003. The unbalanced panel represents 465 observations over the three years.

¹⁰ There are 5 industry classifications using the GEM "1-digit" ISIC categories: Extractive, ManUtility, WholeRetail, FinInsBus, and HEConServices. They combine Agriculture and Mining/Construction, Manufacturing and Transportation, Communication, and Utilities, Wholesale and Retail Trade, Finance, Insurance, and Real Estate and Business Services, and Health, Education, and Social Services and Consumer Services, respectively.

¹¹ These regions are included in their respective country's data, but not analyzed separately.

4.2. Variables

There are three different dependent variables in my analysis, and all measure some aspect of entrepreneurial activity. All three dependent variables are levels of entrepreneurship calculated using the dummy variables for entrepreneurial activity found in the APS.¹² For example there are 83 individuals starting new firms in Germany in the wholesale/retail sector in 2002 out of a total sample size of 7,058 people. The overall TEA for the wholesale/retail sector in Germany in 2002 is therefore $83/7,058 = 1.18\%$. Other dummy variables are available for whether an individual is starting a firm to pursue a business opportunity v. out of economic necessity or whether the individual intends the new firm to create 20+ new jobs in five years; I calculate percentages for opportunity entrepreneurship and Schumpeterian entrepreneurship using these respective variables.

For rule of law, I use a composite average of both the rule of law (ROFL) and property rights (PRRT) for 1999-2001 from the EIU.¹³ The ROFL variable measures the transparency of the legal system, while the PRRT captures the degree to which property is protected by due process. The scale is from 1 to 5, with 1 being weak and 5 being strong. The rationale for using a 10-year average is that this reflects the legal environment better than simply using the score for an individual year, which may be an aberration from a longer trend.¹⁴ In part, this echoes

¹² The variable of entrepreneurial activity is coded “1” if the either of the following definitions are met: 1) Nascent entrepreneur-active participation in the starting of a new firm in the past 12 months, at least partial ownership of the nascent firm, and have not paid wages for more than 3 months. A nascent entrepreneur either has not paid any full-time salaries or distributed profits at all, or they have only done so for a period not exceeding the past three months from the date of interview 2) New firm owner-currently active in management, at least partial ownership of the new firm, and have paid wages or distributed profits, but not beyond a period of the past 42 months from the date of interview. E.g. a respondent interviewed in May 2000 who has been paying at least one full-time salary since May 1997 would be a new owner, but one who has been paying at least one full-time salary since July 1996 would not be a new owner.

¹³ The correlation between these variables is 0.91. Using them separately in regressions had little effect on the results.

¹⁴ I conducted an analysis using an average of the dependent variables, but ultimately decided that there was enough variation within countries across time to justify analyzing each rate of entrepreneurial activity by country, industry, and year.

Williamson's (2000) observation that rule of law is an institution that can change roughly every 10-100 years.¹⁵

For trust, I use an instrumental variables approach that Guiso, et al. (2003, 2006) employ to analyze the economic impact of culture. They define culture as "those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation" (ibid), and they use religion as an instrument for trust.¹⁶ The reason why it is necessary to instrument for trust is that a person's level of trust may be due to many factors of which the values of a society are only one. As mentioned previously, a person's trust level may be the outcome of a repeated game or the influence of the legal system (Axelrod, 1984). What is necessary is the portion of trust that is a value communicated from generation to generation, as opposed to what is due to other factors. By using this approach I hope to minimize the endogeneity that may exist between trust and rule of law, given that there are feedback loops between the two.

The WVS has a dummy variable for trust which asks the basic question, "Do you think most people can be trusted, or that you just can't be too careful?" Respondents who answer that most people can be trusted receive a 1. Using this variable I calculate the percentage of people who agree that most people can be trusted for each country. This percentage, interacted with the "natural" level of entrepreneurship as proxied by the U.S., is the dependent variable for the first-stage OLS regression. I explain this interaction term subsequently.

¹⁵ Williamson (2000) speaks of institutional "levels". Level 1 is the norms and values of a society, which may change over centuries or millennia. Level 2 is the rule of law, specifically constitutions, which may change every decade to a century. Level 3 is contract law, which may change every 1-10 years. Level 4 is the market, which changes constantly.

¹⁶ GSZ cite in particular Putnam (1993) and Blum and Dudley (2001) in showing the connection between religion and trust. Putnam found that Catholic countries generally had a lower level of trust than Protestant countries because the Catholic tradition emphasized a vertical bond with the Church rather than horizontal bonds with fellow citizens. Blum and Dudley also found that Protestantism is associated with a higher level of trust than Catholicism, but they went one step further: they theorized that this higher level of trust was responsible for an economic outcome, namely, higher wages in Protestant cities than in Catholic ones for the time period 1500-1750 AD.

The key independent variables are the percentage of people raised in a particular religious denomination for each country. As with Guiso, et al. (2003), I use the major denominations of Catholic, Protestant, Orthodox, Jewish, Muslim, Hindu, Buddhist, and Other, with the omitted category of None/Atheist for upbringing. Table 1 summarizes the variable definitions.

Table 2 displays the rule of law and trust variables by country. Note that there is some correlation between rule of law and trust, particularly in the developed countries; the correlation is .58 for OECD countries and .06 for non-OECD countries (and .50 overall). A notable example is China, with a high trust of .528 and low rule of law of 1.50. Uganda is a true “basket case”, with both the lowest rule of law (1.00) and trust (.087).

4.3. Methodology

I estimate the effects of rule of law and trust on levels of entrepreneurship using a differences-in-differences methodology popularized by Rajan and Zingales (1998). In their paper on financial development and economic growth, they find that certain industrial sectors that are more in need of external finance develop disproportionately faster in countries with more advanced financial markets. The beauty of their approach is that they come much closer to establishing causality than prior studies; they isolate a specific mechanism (need for external finance* financial development) responsible for economic growth. The first difference in the differences-in-differences methodology is the differing abilities of capital markets in different countries to satisfy their industries’ need for cash. The second difference is the demand for cash among the industries.

By analogy to the context of new firm formation, some industries are more in need of protection from expropriation of rents than others. This is the case because industries differ from one another in profitability, cost of assets employed, and firm size. One would expect a new

biotech firm to require more assets than a restaurant; hence, more protection is needed in the biotech sector than in the restaurant sector to stimulate entrepreneurial activity. Furthermore, one might expect more entrepreneurial activity in the biotech sector in countries where protection is strong than in countries where it is weak. The differences-in-differences methodology assumes different levels of protection against expropriation of rents across industry sectors for new firm formation, and greater levels of entrepreneurial activity in sectors requiring heightened levels of security in those countries providing strong protection.

In order for these differences to be apparent, there must be a basis of comparison. Rajan and Zingales (hereafter RZ) assume that firms in the United States represent a “normal” demand for financing based on the fact that the U.S. has the largest and most advanced capital markets. In the same vein, I assume that the overall level of entrepreneurship in the U.S. is the base case for several reasons. First, the U.S. has the largest economy in the world. Second, the U.S. has a Rule of Law score of 4.5 which puts it at the peak of Rule of Law for entrepreneurial activity according to Figure 1. Third, the U.S. is known anecdotally for its entrepreneurial zeal, e.g. Silicon Valley. It should not be assumed that the U.S. is the leader in new firm creation in all industries; rather, that the overall rule of law environment in the U.S. is optimal.¹⁷

The equations for estimating levels of entrepreneurship are as follows:

$$TEA_{i,c,t} = \alpha_1 Rule_c * Base_i + \alpha_2 ILO_{i,c} + \alpha_3 IndustryDummies_i + \alpha_4 CountryDummies_c + \alpha_5 TimeDummies_t + Constnt + \varepsilon_{i,c,t} \quad (1)$$

$$TEA_{i,c,t} = \alpha_1 Trust_c * Base_i + \alpha_2 ILO_{i,c} + \alpha_3 IndustryDummies_i + \alpha_4 CountryDummies_c + \alpha_5 TimeDummies_t + Constnt + \varepsilon_{i,c,t} \quad (2)$$

where the first-stage regression is:

¹⁷ I recognize that the choice of base is crucial, so I perform a robustness check of my results using Germany as the base. The U.S. is a justifiable choice for the reasons I have given, but other countries could also be selected with justification.

$$\begin{aligned}
Trust_c = & \alpha_1 Buddhist_c + \alpha_2 Hindu_c + \alpha_3 Jewish_c + \alpha_4 Islam_c + \alpha_5 Orthodox_c + \alpha_6 Other_c \\
& + \alpha_7 Protestant_c + \alpha_8 Catholic_c + \alpha_9 IndustryDummies + \alpha_{10} CountryDummies_c + \quad (3) \\
& \alpha_{11} TimeDummies + Constnt + \varepsilon
\end{aligned}$$

where i , c , and t are subscripts for industry, country, and time respectively, Base is the U.S. level of entrepreneurship in a given industry in 2001, ILO is a control variable for country and industry characteristics that vary simultaneously and consists of the percentage employed in each industry by country. Equations (2) and (3)¹⁸ show the effects of rule of law and trust, respectively, on levels of entrepreneurship. Note that these equations are run for the three dependent variables: overall TEA (TEA), opportunity TEA (TEAOPP), and Schumpeterian TEA (TEAJOBS). I also include a quadratic term for rule of law in a separate, modified version of Equation (1) in order to test **H3**.

For further analysis I divide the sample between the Organization for Economic Cooperation and Development (OECD) member countries and the non-members. OECD membership proxies for economic development; I aim to examine if there is a differential effect of rule of law and trust between developed and developing countries. I repeat the initial regressions for TEA, TEAOPP, and TEAJOBS for these subsamples. In the case of subsamples it is not possible to use country dummies with the 2SLS due to restricted degrees of freedom. I run regressions with and without regional dummies in lieu of country dummies.

I control for industry fixed effects, country fixed effects, time fixed effects, and characteristics varying by both country and industry. Like RZ, my intent is to limit the potential for endogeneity and omitted variables to taint the results. If I cannot claim causality for the effects of rule of law and trust on levels of entrepreneurship at least I will have stronger

¹⁸ I include other regressions, including Rule and Trust together, in the appendix to this paper. For the 2SLS regressions with Rule and Trust Rule is a variable estimating Trust in the first stage.

correlations for these relationships than most empirical work studying cross-country effects on new firm formation.¹⁹

5. RESULTS

Table 3 displays the results for all countries. The standard errors are clustered by country, and for convenience the control variables are not reported. The U.S. is the base country, the Extractive industry is the base industry, and 2001 is the base year.

The first notable findings are that Rule*U.S. Base is negative and significant at the 5% level for overall levels of entrepreneurial activity and negative but insignificant for opportunity entrepreneurship. This contradicts **H3**, which predicted a positive effect for rule of law on both overall and opportunity entrepreneurial activity up to a point, beyond which the effect would be insignificant or negative. Also, Rule*U.S. Base is positive and significant at the 1% level for Schumpeterian entrepreneurial activity, as **H1** predicted.

Turning to the results for trust, we see that Trust*U.S. base is positive but insignificant for both overall and opportunity entrepreneurial activity. These findings contradict **H4**. Trust*U.S. Base is positive and significant at the 5% level for Schumpeterian new firm formation. Trust is important for Schumpeterian entrepreneurs but the rule of law term is more significant. This finding supports **H1** and **H2**²⁰. I find that when combining Rule and Trust together in the regression that neither one is significant.

The Hansen's J statistic is significant for the three initial 2SLS specifications, but it is not significant when rule is added (Hansen, 1982). This statistic tests over-identification of the model using generalized method-of-moments (GMM), and can only indicate if an instrument is a

¹⁹ A recent work employing this same methodology is Klapper, Laeven, and Rajan (2006), who examine entry regulation as a barrier to entrepreneurship.

²⁰ For robustness I ran regressions both with and without the ILO control variable. The results were virtually identical. Table 3 results do include the ILO variable as part of the regression but it was omitted in subsequent analyses.

poor one or not. Based on this statistic, religion may not be a poor instrument for trust as a value passed from one generation to the next, but I cannot conclude that it is a good instrument.

In order to test **H3**, I modify the initial regression to incorporate a quadratic term for rule of law. Table 4 displays the results. Rule is positive and significant at 1% for both TEA and TEAOPP, while Rule2, the quadratic term, is negative and significant at 1% for both dependent variables. Interactive terms with the U.S. base are insignificant with the exception of Rule2*U.S. base, which is negative at 5%. These results support **H3**.

I also perform a robustness check (not shown) using a variable for the amount of time in days spent to start a new business from the World Bank's World Development Indicators for 2003. . I assume that the relationship between regulatory burden and new firm formation is decreasing in a linear fashion; i.e., each new regulation results in steadily less entrepreneurship. My contention in H3 is that "too much" rule of law involves regulatory burden that stifles new firm formation. I do find a positive correlation between rule of law and the time spent to start a new business, and this variable has a significant, negative effect on new firm formation for countries that have a rule of law score above 4.5. This supports **H3**, but I treat this analysis with caution as it is exploratory in nature. I am considering other pertinent variables to test as well.

Table 5 presents the subsample analysis of OECD v. non-OECD countries. For the three dependent variables, I ran three separate regressions: 1) Rule, 2) Trust without regional dummies, and 3) Trust with regional dummies. For the OECD countries, the only significant result is Rule*U.S. Base for TEAJOBS at the 5% level. For the non-OECD countries Rule is significant at the 10% level for TEAJOBS but not for overall or opportunity new firm formation. In the developing world Trust*U.S. Base is positive and significant at the 1% level for overall

entrepreneurial activity and at the 5% level for opportunity entrepreneurial activity, but only in the model where regional dummies are included. For TEAJOBS, Trust*U.S. Base is positive and significant at the 5% level both when regional dummies are included and when they are not. In terms of the economic impact, it is difficult to compare Rule and Trust directly. For TEAJOBS, a 1-unit change in Rule (e.g. from 3.00 to 4.00 on the 5-point scale) would increase the level of Schumpeterian entrepreneurship by 8.1%.

With regards to the hypotheses, the results on Table 5 are mixed. Rule of law is important for Schumpeterian entrepreneurship in both wealthy and poor nations, but trust matters for Schumpeterian new firms only in the developing country context according to these results. **H1** is partially supported. Rule of law is more significant than trust for Schumpeterian entrepreneurs in OECD countries, where trust is insignificant, but trust is more significant than rule of law for Schumpeterian entrepreneurs in non-OECD countries. **H2** is partially supported. Rule of law does have zero or negative impact on overall and opportunity new firm formation in both subsamples, so **H3** is supported. Trust has a significant, positive effect on both overall and opportunity entrepreneurial activity, but only in developing economies. **H4** is partially supported.

My argument throughout the paper is that rule of law should have more impact on entrepreneurs who risk more to start their businesses. I try one final analysis to test this idea. I regress the difference between a country's level of entrepreneurial activity and the U.S. level on the difference between the country's rule of law and the U.S. law along with interactive terms for industry as follows:

$$\Delta TEA_{i,c,t} = \alpha_1 + \alpha_2 (Rule_c - Rule_{U.S.}) + \alpha_3 (Rule_c - Rule_{U.S.}) * IndustryDummies_i + \alpha_4 IndustryDummies_i + \alpha_5 YearDummies + \varepsilon \quad (4)$$

The base industry is Extractive, which is agriculture and mining. It is chosen because the asset requirements for starting a new business in the Extractive are moderate; more assets would be expected for starting a business in banking or biotechnology but fewer assets would be needed to start a firm in retail clothing. This same regression is run for opportunity and Schumpeterian entrepreneurs, and also using Trust instead of Rule as the key variable.

Table 6 shows the results. Note that both the differences in Rule and Trust are positive and significant for overall, opportunity, and Schumpeterian entrepreneurship for Finance, Insurance, Real Estate, and Business Services (FIN). This is a noteworthy result because the FIN sector includes most of the 4-digit ISIC high-tech segments such as computer software, research and development, and other related activities. These results indicate that relative to agriculture and mining, the high-tech sectors require more protection against expropriation of rents. Wholesale/Retail, by contrast, does not require protection relative to the extractive industries. It is indeterminate whether rule of law or trust is more significant for businesses in the FIN sector from these results, so I combined the Rule and Trust interactive terms in a separate regression (not shown). This robustness check showed that only Rule*FIN was significant when all terms were included, indicating that indeed rule of law is more important than trust for entrepreneurial activity in this sector.

6. DISCUSSION

The main finding of this paper is that institutions protecting against expropriation of rents have a positive, significant effect on levels of Schumpeterian entrepreneurship, but are insignificant for other types of entrepreneurial activity. This finding adds support to the view of Pissarides, Singer, and Svejnar (2003) and runs counter to the perspective of Johnson, McMillan, and Woodruff (2002). The former find that property rights are not a constraint for entrepreneurs

operating in Bulgaria and Russia. The latter conclude that property rights are important for reinvestment of profits by entrepreneurs into their businesses; the entrepreneurs they survey are located in the Eastern European countries of Russia, Ukraine, Poland, Slovakia, and Romania.

There are several key differences between this study and these two papers. The first is that both of the prior studies are restricted to Eastern Europe, whereas the data for this paper spans 41 countries around the world. Additionally, the Johnson et al (2002) paper surveyed only manufacturing firms, whereas this data represents a cross-section of industries. The results of this study are therefore more generalizable. Second, both of the prior studies suffer from survivor bias since only entrepreneurs of existing firms were surveyed; entrepreneurs that failed or entrepreneurs who were so successful that their firms could no longer be classified as small are not included. The data and measures for this paper do include nascent entrepreneurs and so avoid the problem of survivor bias. A related point is that this study examines new firm formation whereas the preceding studies measure firm entry. Third, the prior studies focus more on capital availability than this paper. Pissarides et al. (2003) find the lack of external financing to be the most serious constraint facing entrepreneurs and Johnson et al. (2003) are examining the relationship between property rights and reinvestment. This paper joins the conversation started by these prior authors but is not directly comparable to their studies given the differences just mentioned.

The results also suggest that rule of law and trust function as complements for Schumpeterian entrepreneurship, since both have a positive effect. This is in accordance with Poppo and Zenger (2002), who conclude that both formal (contracts) and informal (trust) governance mechanisms complement one another. There is the caveat that Poppo and Zenger (2002) studied one sector (information services) in one country (U.S.) and that the formal

institution they consider is contract law and not rule of law. Also, when both trust and rule of law are in the same regression rule of law is more significant. This is true for Schumpeterian entrepreneurs as well as for all entrepreneurial activity in the high-tech industry segment. This finding is consistent with our intuition that while both trust and rule of law can provide protection against expropriation of rents, it is rule of law that is more significant for entrepreneurs who need more protection, e.g. starting firms that employ more people or that are situated in an industry where intellectual property is paramount or both.

Beyond these findings, the other contributions this paper makes are methodological: the dissemination of existing methodological techniques developed by Guiso, et al. (2003) and Rajan and Zingales (1998) to the entrepreneurship literature. The former is an instrumental variables approach for handling the impact of culture on economic outcomes, of which new firm formation is one. The key is to define culture in terms of values and preferences passed from one generation to the next; such a definition allows measurement. The latter establishes a mechanism for the institutional impact on new firm formation and carefully controls for other industry and country effects. These approaches hold great promise, as there are myriad institutions which affect entrepreneurship and the potential exists for more careful analysis of the institutional relationships than existed previously.

There are several avenues for future work. The first would be a more nuanced industry analysis. Using five large industry classifications is admittedly crude, but with the current methodology a more nuanced industry analysis becomes problematic because many country-industry pairs have no entrepreneurs when the scope is narrowed to new firms creating 20+ jobs.²¹ There is data at the 4-digit level that offers some intriguing possibilities for future

²¹ I tried regressions using 10 “1-digit” ISIC classifications that GEM also uses: Agriculture, Mining/Construction, Manufacturing, Transportation/Communications/Utilities, Wholesale, Retail, Finance/Insurance/Real Estate,

research: across the three years there are 244 entrepreneurs in software consultancy and supply (ISIC 7220), 150 entrepreneurs in telecommunications (ISIC 6420), 312 entrepreneurs in computer-related activities (ISIC 7290), and 52 entrepreneurs in research and development activities (ISIC 7300). The key is to find a methodology that can exploit this data while controlling for the endogeneity and omitted-variables bias which plagues so many cross-country studies; the RZ methodology used here handles these concerns well. A matched sample of high-tech entrepreneurs, low-tech entrepreneurs, and non-entrepreneurs sharing the same demographic characteristics such as age, education, and income would be the first step in this direction.

Another possibility for future research is to analyze other cultural norms that may play a role in new firm formation. Values such as egalitarianism²² and thrift may be important for entrepreneurship, but have yet to be studied in great detail. The emphasis in studying such values would represent a shift from institutions as constraining devices to institutions as legitimizing devices for entrepreneurial behavior.

Finally, it would be useful for scholars, policymakers, and entrepreneurs to understand the relationship between the institutional framework and firm performance. One disadvantage of the GEM data is that it gives no measures for firm profitability, longevity, or productivity. One cannot say what strategy an entrepreneur should adopt to maximize firm performance given a set of institutional constraints with the current data. Future work will focus on this germane issue.

Business Services, Health/Education/Social Services, and Consumer Services. The results were similar to the results for the 5-sector analysis.

²² Siegel, Licht, and Schwartz (2006) offer a fascinating study concerning the effect of egalitarianism on international investment, but to my knowledge the relationship between egalitarianism and new firm formation has yet to be explored.

7. REFERENCES

- Acs, Z. 1992. Small business economics: A global perspective. *Challenge*, 35(6): 38-44.
- Acs, Z. & Audretsch, D. 1990. *Innovation and small firms*. Cambridge: MIT Press.
- Aldrich, H. & Fiol, M. 1994. Fools rush in? The institutional context of industry creation. *Academy of Management Review*, 19(4): 645-670.
- Axelrod, R. 1984. *The evolution of cooperation*. New York: Basic Books.
- Bates, T. 1995. Self-employment entry across industry groups. *Journal of Business Venturing*, 10(2): 143-156.
- Baum, J., Olian, J., Erez, M., Schnell, E., Smith, K.G., Sims, H., Scully, J. & Smith, K.A. 1993. Nationality and work role interactions: a cultural contrast of Israeli and U.S. entrepreneurs' versus managers' needs. *Journal of Business Venturing*, 8(6): 499-512.
- Baumol, W. 1990. Entrepreneurship: Productive, unproductive, and destructive. *Journal of Political Economy*, 98(5): 893-921.
- Blanchflower, D. & Oswald, A. 1998. What makes an entrepreneur? *Journal of Labor Economics*, 16(1): 26-60.
- Blum, U. & Dudley, L. 2001. Religion and economic growth: Was Weber right? *Journal of Evolutionary Economics*, 11(2): 207-230.
- Boettke, P.J., & Coyne, C.J. 2003. Entrepreneurship and development: Cause or consequence? In R. Koppel (ed.), *Advances in Austrian economics, vol. 6*: 13-30. New York: JAI Press.
- Busenitz, L. & Barney, J. 1997. Differences between entrepreneurs and managers in large organizations: biases and heuristics in strategic decision-making'. *Journal of Business Venturing*, 12(1): 9-30.
- Busenitz, L.W., Gomez, C. & Spencer, J. 2000. Country institutional profiles: Unlocking entrepreneurial phenomenon. *Academy of Management Journal*, 43(5): 994-1003.
- Casson, M. 1995. *Entrepreneurship and business culture*. Brookfield: Edward Elgar Publishing.
- Coase, R. 1960. The problem of social cost. *Journal of Law and Economics*, 3(1): 1-44.
- Delmar, F. & Davidsson, P. 2000. Where do they come from? Prevalence and characteristics of nascent entrepreneurs. *Entrepreneurship and Regional Development*, 12(1): 1-23.

Desai, M., Gompers, P., & Lerner, J. 2003. Institutions, capital constraints, and entrepreneurial firm dynamics: evidence from Europe. *NBER Working Paper No. 10165*.

DiMaggio, P. & Powell, W. 1983. The iron cage revisited: Institutional Isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48(2): 147-160.

Gambetta, D. 2000. Can we trust trust? In Gambetta, D. (ed.), *Trust: Making and breaking cooperative relations*, Oxford: 213-237.

Global Entrepreneurship Monitor Data Files, 2001-2003. [www.documents]
<http://www.gemconsortium.org>. (Accessed September 3, 2005).

Granovetter, M. 1985. Economic action and social structure: A theory of embeddedness. *American Journal of Sociology*, 91(3): 481-510.

Greif, A. 1993. Contract enforceability and institutions in early trade: The Maghribi traders' coalition. *American Economic Review*, 83(3): 525-548.

Greve, A. & Salaff, J. 2003. Social networks and entrepreneurship. *Entrepreneurship Theory and Practice*, 28(1): 1-22.

Guiso, L., Sapienza, P., & Zingales, L. 2003. People's opium? Religion and economic attitudes. *Journal of Monetary Economics*, 50: 225-282.

Guiso, L., Sapienza, P., & Zingales, L. 2006. Does culture affect economic outcomes? *Journal of Economic Perspectives*, 20(2): 23-48.

Gwartney, J., Lawson, A., & Holcombe, R. 1999. Economic freedom and the environment for economic growth. *Journal of Institutional and Theoretical Economics*, 155: 643-663.

Hannan, M. & Freeman, J. 1987. The ecology of organizational founding: American labor unions, 1836-1975. *American Journal of Sociology*, 92(4): 910-943.

Hansen, L. 1982. Large sample properties of generalized method of moments estimators. *Econometrica*, 50(4): 1029-1054.

Harper, D.A. 1998. Institutional conditions for entrepreneurship. In P.J. Boettke, I.Kirzner, M. Rizzo, & S.Ikeda (Eds.), *Advances in Austrian economics, vol.5*: 241-275. New York: JAI Press.

Harper, D.A. 2003. *Foundations of entrepreneurship and economic development*. New York: Routledge Press.

Hayek, F. 1960. *The constitution of liberty*. London: Routledge and Kegan Paul.

- Henrekson, M. 2003. Entrepreneurship: A weak link in the welfare state. *Working Paper, Stockholm School of Economics*.
- Hodgson, G. 2006. What are institutions? *Journal of Economic Issues*, 40(1): 1-26.
- James, H. 2002. The trust paradox: A survey of economic inquiries into the nature of trust and trustworthiness. *Journal of Economic Behavior & Organization*, 47: 291-307.
- Johnson, S., McMillan, J., & Woodruff, C. 2002. Property rights and finance. *American Economic Review*, 92(5): 1335-1356.
- Kansas City Business Journal, September 22, 2005: Kauffman study: Number of new businesses rises. Accessed on-line at <http://kansascity.bizjournals.com/kansascity/stories/2005/09/19/daily31.html> on March 14, 2006.
- Kihlstrom, R. & Laffont, J. 1979. A general equilibrium entrepreneurial theory of firm foundation based on risk aversion. *Journal of Political Economy*, 87(4): 719-748.
- Knight, F. 1921. *Risk, uncertainty, and profit*. New York: Augustus Kelly Publishing.
- Kirzner, I. 1973. *Competition and entrepreneurship*. Chicago: University of Chicago Press.
- Kirzner, I. 1997. Entrepreneurial discovery and the competitive market process: an Austrian approach. *Journal of Economic Literature*, 35(1): 60-85.
- Klapper, L., Laeven, L. & Rajan, R. 2006. Entry regulation as a barrier to entrepreneurship. *Journal of Financial Economics*, 82(3): 591-629.
- Kostova, T. 1997. Country institutional profiles: Concept and measurement. *Academy of Management Best Paper Proceedings*: 180-189.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. 1998. Law and finance. *Journal of Political Economy*, 106(6): 1113-1155.
- McClelland, D. 1961. *The achieving society*. Princeton: Van Nostrand Publishing.
- McMillan, J. & Woodruff, C. 2002. The central role of entrepreneurs in transition economies. *Journal of Economic Perspectives*, 16(3): 153-170.
- MediaCorp News, January 24, 2005: Singapore attracted 3,664 new high-tech businesses last year. Accessed on-line at <http://www.channelnewsasia.com/stories/singaporebusinessnews/view/128872/1/.html> on March 14, 2006.

- Mesch, G. & Czamanski, D. 1997. Occupational closure and immigrant entrepreneurship: Russian Jews in Israel. *Journal of Socio-Economics*, 26(6): 597-611.
- North, D. 1990. *Institutions, institutional change, and economic performance*. Cambridge: Harvard University Press.
- North, D. 1994. Economic performance through time. *American Economic Review*, 84(3): 359-368.
- Oviatt, B. & McDougall, P.P. 1994. Toward a theory of international new ventures. *Journal of International Business Studies*, 25(1): 45-64.
- Pissarides, F., Singer, M., & Svejnar, J. 2003. Objectives and constraints of entrepreneurs: Evidence from small and medium-size enterprises in Russia and Bulgaria. *Journal of Comparative Economics*, 31: 503-531.
- Poppo, L. & Zenger, T. 2002. Do formal contracts and relational governance function as substitutes or complements? *Strategic Management Journal*, 23: 707-725.
- Posner, R. 1980. A theory of primitive society, with special reference to law. *Journal of Law and Economics*, 23(1): 1-53.
- Putnam, R. 1993. *Making democracy work: Civic traditions in modern Italy*. Princeton: Princeton University Press
- Rajan, R. & Zingales, L. 1998. Financial dependence and growth. *American Economic Review*, 88(3): 559-585.
- Rees, H. & Shah, A. 1986. An empirical analysis of self-employment in the U.K. *Journal of Applied Econometrics*, 1(1): 95-108.
- Reynolds, P. 1997. Who starts new firms? Preliminary explorations of firms-in-gestation. *Small Business Economics*, 9(5): 449-462.
- Reynolds, P. 2003. Entrepreneurial advantage of nations: Overview of 2002 Global Entrepreneurship Monitor. UN Workshop held on April 29, 2003, [www.document] <http://www.gemconsortium.org> (accessed September 20, 2005).
- Ritsila, J. & Tervo, H. 2002. Effects of unemployment on new firm formation: Micro-level panel data evidence from Finland. *Small Business Economics*, 19(1): 31-40.
- Rodrik, D. Institutions for high-quality growth: What they are and how to acquire them. *Studies in Comparative International Development*, 35(3): 3-31.
- Schiller, B. & Crewson, P. 1997. Entrepreneurial origins: A longitudinal inquiry. *Economic Inquiry*, 35(3): 523-531.

- Schumpeter, J.A. 1934. *The theory of economic development*. Cambridge: Harvard University Press.
- Shane, S. 2003. *A general theory of entrepreneurship*. Northampton: Edward Elgar Press.
- Shane, S. & Venkataraman, S. 2000. The promise of entrepreneurship as a field of research. *Academy of Management Review*, 26(1): 13-17.
- Siegel, J., Licht, A., & Schwartz, S. 2006. Egalitarianism and international investment. *Working paper, Harvard Business School*.
- Storey, D. 1994. *Understanding the small business sector*. London: Routledge Press.
- Taylor, M. 2001. Self-employment and windfall gains in Britain: Evidence from panel data. *Economica*, 68(272): 539-565.
- Tushman, M. & Anderson, P. 1986. Technological discontinuities and organizational environments. *Administrative Science Quarterly*, 31(3): 439-465.
- Venkataraman, S. 1997. The distinctive domain of entrepreneurship research: An editor's perspective. In J. Katz and R. Brockhaus (Eds.), *Advances in entrepreneurship, firm emergence and growth, Vol. 3*: 119-138. Greenwich: JAI Press.
- Weingast, B. 1995. The economic role of political institutions: Market-preserving federalism and economic development. *Journal of Law, Economics, & Organization*, 11(1): 1-31.
- Williamson, O. 1985. *The economic institutions of capitalism*. New York: Free Press.
- Williamson, O. 1993. Calculativeness, trust, and economic organization. *Journal of Law and Economics*, 36(1): 453-486.
- Williamson, O. 2000. The new institutional economics: Taking stock, looking ahead. *Journal of Economic Literature*, 38: 595-613.
- World Bank Online Data and Statistics, 2002. <http://worldbankdata.org>. Accessed April 10, 2006.
- World Values Survey, 1999-2001. <http://www.worldvaluessurvey.org>. Accessed March 1, 2006.

Figure 1: Entrepreneurial Activity and Rule of Law

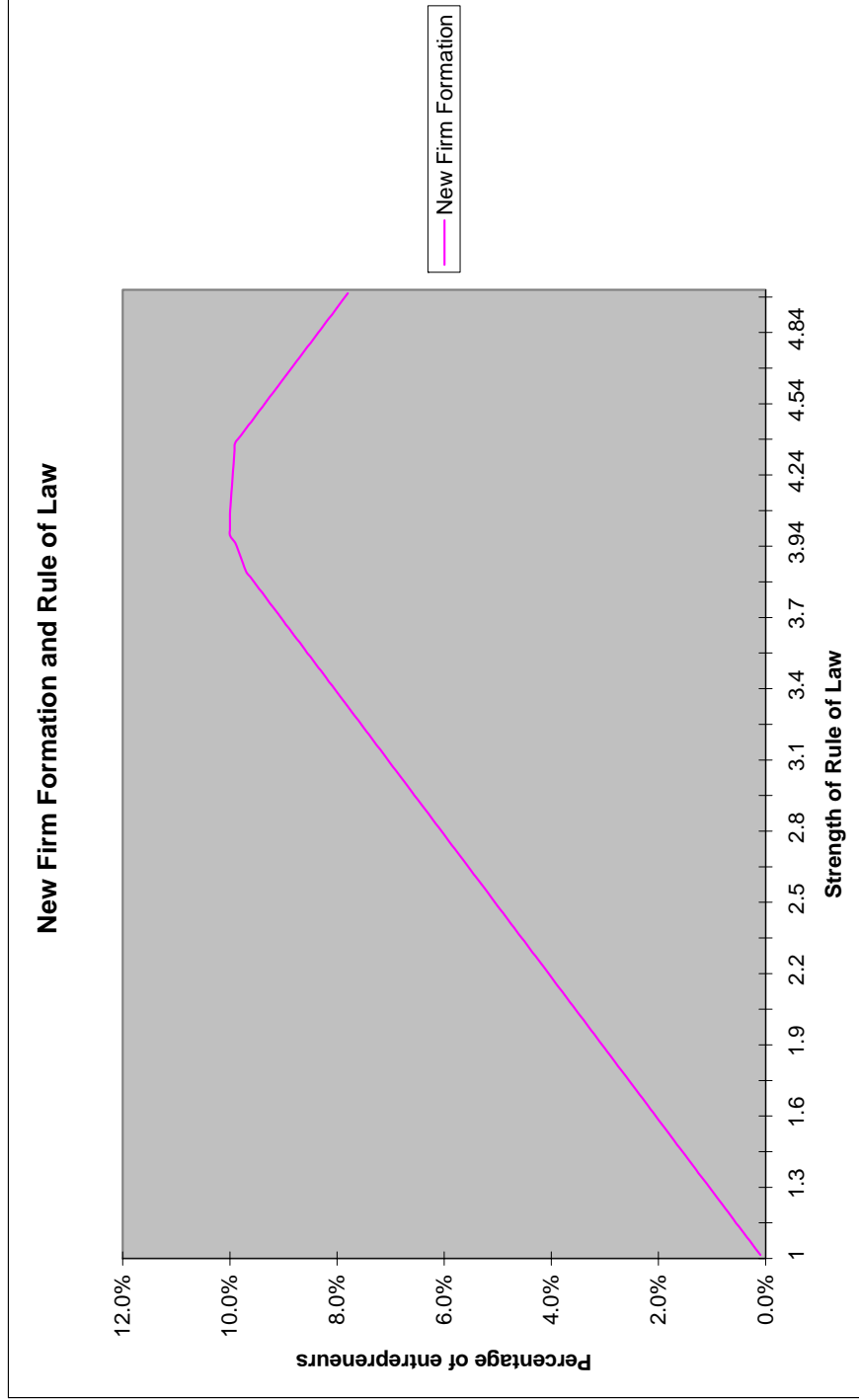


Table 1: Variable Descriptions

| | <u>Variable name</u> | <u>Construct</u> | <u>Description</u> | <u>Source</u> |
|-----------------------|----------------------|--|--|---|
| Dependent Variables | TEA | New firm formation | Total Entrepreneurial Activity, measured as a percentage of the total country sample in a given year for a given industry. The numerator is the number of nascent entrepreneurs and new firm owners in a given industry, country, and year, the denominator is the country sample for that year. | Calculated from the Global Entrepreneurship Monitor (GEM) Adult Population Surveys (APS) for 2001-2003. |
| | TEAOPP | New firm formation: Motivation-opportunity v. necessity. | Similar to TEA above, but with the numerator restricted to nascent entrepreneurs and new firm owners who start a business out of a desire to be an entrepreneur v. due to economic necessity | Calculated from the GEM APS for 2001-2003. |
| | TEAJOBS | New firm formation: Opportunity type-Schumpeterian v. Kirznerian. | Similar to TEA above, but with the numerator restricted to nascent entrepreneurs and new firm owners who start a business with the intention of creating 20+ new jobs in the next five years. | Calculated from the GEM APS for 2001-2003. |
| Independent Variables | RULE | Protection against expropriation of rents for new firms offered by the formal institutions of rule of law (due process) and property rights (credible commitment on the part of the state to forego arbitrary confiscation). | A composite average of the Rule of Law (ROFL) and Property Rights (PRRT) Indices for the 1992-2001 time period. The scale is 1-5, with 1 being weak and 5 being strong. | Calculated from the Economist Intelligence Unit (EIU). |
| | TRUST | Protection against expropriation of rents for new firms offered by the informal institution of trust (the subjective probability that an economic actor will behave in an expected way-Gambetta, 2000). | The percentage of people who are trusting for each country | Calculated from the World Values Survey (WVS) 1999-2001 wave. |
| | BUDDHIST | Values shaping TRUST | The percentage of people raised Buddhist | Calculated from the World Values Survey (WVS) 1999-2001 wave. |
| | HINDU | " | " " " " " Hindu | " |
| | JEWISH | " | " " " " " Jewish | " |
| | MUSLIM | " | " " " " " Muslim | " |
| | ORTHODOX | " | " " " " " Orthodox | " |
| | PROTESTANT | " | " " " " " Protestant | " |
| | CATHOLIC | " | " " " " " Catholic | " |
| OTHER | " | " " " " " in another faith | " | |
| NONE | " | " " " " " in no faith | " | |
| Control Variables | ILO | Country/Industry characteristics that vary simultaneously | The percentage of actively employed by industry and by country. | Calculated from the International Labour Organization for 2000. |
| | Industry dummies | Industry fixed effects | Dummy variables for the 5 industry classifications: Extractive, ManUtility, Wholesale/Retail, FinInsBusServices, and HEConServices | N/A |
| | Country dummies | Country fixed effects | Dummy variables for the 41 countries. | N/A |
| | Time dummies | Time trend | Dummy variables for the years: 2001, 2002, and 2003. | N/A |

Table 2: Descriptive Statistics

| <u>Country name</u> | <u>Observations</u> | <u>RULE</u> | <u>TRUST</u> |
|---------------------------|---------------------|-------------|--------------|
| Argentina | 15 | 3.34 | 0.155 |
| Australia | 15 | 4.78 | 0.287 |
| Belgium | 15 | 4.50 | 0.289 |
| Brazil | 15 | 3.00 | 0.226 |
| Canada | 15 | 4.50 | 0.372 |
| Chile | 10 | 4.00 | 0.226 |
| China | 10 | 1.50 | 0.528 |
| Croatia | 10 | 1.10 | 0.200 |
| Denmark | 15 | 4.72 | 0.673 |
| Finland | 15 | 5.00 | 0.560 |
| France | 10 | 4.50 | 0.219 |
| Germany | 15 | 5.00 | 0.352 |
| Greece | 5 | 3.50 | 0.202 |
| Hong Kong | 10 | 4.22 | 0.144 |
| Hungary | 10 | 3.50 | 0.221 |
| Iceland | 10 | 5.00 | 0.394 |
| India | 10 | 3.00 | 0.389 |
| Ireland | 15 | 4.50 | 0.368 |
| Israel | 10 | 3.50 | 0.230 |
| Italy | 10 | 2.36 | 0.337 |
| Japan | 15 | 4.50 | 0.406 |
| Mexico | 10 | 2.34 | 0.219 |
| Netherlands | 10 | 5.00 | 0.604 |
| New Zealand | 15 | 5.00 | 0.489 |
| Norway | 15 | 5.00 | 0.648 |
| Poland | 10 | 2.50 | 0.178 |
| Portugal | 5 | 4.00 | 0.120 |
| Russia | 10 | 1.32 | 0.232 |
| Singapore | 15 | 4.28 | 0.144 |
| Slovenia | 10 | 2.40 | 0.219 |
| South Africa | 15 | 3.50 | 0.129 |
| South Korea | 10 | 4.00 | 0.273 |
| Spain | 15 | 3.50 | 0.339 |
| Sweden | 15 | 5.00 | 0.642 |
| Switzerland | 10 | 5.00 | 0.351 |
| Taiwan | 5 | 4.00 | 0.375 |
| Thailand | 5 | 3.50 | 0.394 |
| Uganda | 5 | 1.00 | 0.081 |
| UK | 15 | 5.00 | 0.292 |
| USA | 10 | 4.50 | 0.358 |
| Venezuela | 5 | 2.35 | 0.167 |
| Total Observations | 465 | | |
| Averages | | 3.74 | 0.318 |

Notes: 1) The EIU did not have data for Uganda, so the World Heritage Foundation index was used instead.
2) The WVS did not cover Thailand for 1999-2001. Vietnam was used as a proxy due to cultural and geographic proximity.

Table 3: All Countries Results-U.S. Base

| | | Dependent Variable: | TEA | TEAOPP | TEAJOBS |
|--------------------------|------|---------------------|---------------------|-------------------|---------------------|
| 1. Rule | | Rule*U.S. base | -0.378** (0.171) | -0.058 (0.061) | 0.076*** (0.020) |
| | | No. of observations | 465 | 465 | 465 |
| | | R-squared | 0.4927 | 0.4760 | 0.4796 |
| 2. Trust | 2SLS | Trust*U.S. base | 1.701 (1.466) | 1.166 (1.065) | 3.385** (1.387) |
| | | No. of observations | 465 | 465 | 465 |
| | | R-squared | 0.2672 | 0.2933 | 0.1505 |
| | | Hansen's J | 34.208*** | 27.834** | 71.890*** |
| 3. Rule and Trust | | Rule*U.S.base | -0.946 (1.321) | -0.025 (0.582) | 0.559 (0.371) |
| | 2SLS | Trust*U.S.base | -0.022 (0.259) | 0.032 (0.078) | 0.008 (0.035) |
| | | No. of observations | 465 | 465 | 465 |
| | | R-squared | 0.4507 | 0.4567 | 0.4740 |
| | | Hansen's J | 4.020 | 2.103 | 5.929 |

Notes: 1) *-significant at 10%, **-significant at 5%, ***-significant at 1%.
2) Standard errors are clustered by country.
3) Industry, country, and year dummies are not shown. The base industry is Extractive, the base country is the U.S., and the base year is 2001.

Table 4: All Countries Results-Quadratic Term

| Dependent Variable: | TEA | TEAOPP |
|---------------------|----------------------|----------------------|
| Rule | 0.011*** (0.003) | 0.007*** (0.001) |
| Rule^2 | -0.003*** (0.000) | -0.002*** (0.000) |
| U.S. base | 2.042*** (0.572) | 0.609*** (0.204) |
| Rule*U.S. base | -0.005 (0.196) | -0.015 (0.097) |
| Rule^2*U.S. base | -0.058** (0.027) | -0.003 (0.016) |
| Industry dummies | Yes | Yes |
| Country dummies | Yes | Yes |
| Year dummies | Yes | Yes |
| Constant | 0.017* (0.009) | 0.016*** (0.003) |
| No. of observations | 465 | 465 |
| Adjusted R-squared | 0.42 | 0.40 |

Notes: 1) *-significant at 10%, **-significant at 5%, ***-significant at 1%.
2) Standard errors are clustered by country.
3) Industry, country, and year dummies are not shown. The base industry is Extractive, the base country is the U.S., and the base year is 2001.

Table 5: OECD v. Non-OECD Country Results
Dependent Variable:

A. OECD countries

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---------------------|--------------------|---------------------|---------------------|---------------------|---------------------|---------------------|--------------------|------------------|--------------------|
| | TEA | TEA | TEA | TEAOPP | TEAOPP | TEAOPP | TEAOPP | TEAJOBS | TEAJOBS |
| Rule*U.S. base | -0.296 (0.232) | | | -0.077 (0.104) | | | 0.081** (0.033) | | |
| Trust*U.S. base | | 0.052 (0.657) | -2.208 (1.631) | | 0.412 (0.555) | -1.152 (1.103) | | 0.488 (0.633) | -1.170 (1.386) |
| Industry Dummies | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| Country Dummies | YES | NO | NO | YES | NO | NO | YES | NO | NO |
| Regional Dummies | NO | NO | YES | NO | NO | YES | NO | NO | YES |
| Year Dummies | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| Constant | 0.023** (0.010) | 0.006*** (0.001) | 0.011*** (0.003) | 0.011*** (0.003) | 0.006*** (0.002) | 0.021*** (0.005) | 0.001 (0.000) | 0.000 (0.000) | 0.002** (0.001) |
| No. of observations | 305 | 305 | 305 | 305 | 305 | 305 | 305 | 305 | 305 |
| R-squared | 0.5451 | 0.1573 | 0.3345 | 0.5884 | 0.1715 | 0.3843 | 0.4911 | 0.1678 | 0.1300 |

B. Non-OECD countries

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---------------------|---------------------|------------------|---------------------|---------------------|------------------|--------------------|---------------------|--------------------|--------------------|
| | TEA | TEA | TEA | TEAOPP | TEAOPP | TEAOPP | TEAOPP | TEAJOBS | TEAJOBS |
| Rule*U.S. base | -0.285 (0.376) | | | -0.041 (0.125) | | | 0.069* (0.035) | | |
| Trust*U.S. base | | 1.062 (1.413) | 2.730*** (0.739) | | 0.720 (0.800) | 1.550** (0.611) | | 2.871** (1.393) | 3.620** (1.285) |
| Industry Dummies | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| Country Dummies | YES | NO | NO | YES | NO | NO | YES | NO | NO |
| Regional Dummies | NO | NO | YES | NO | NO | YES | NO | NO | YES |
| Year Dummies | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| Constant | 0.049*** (0.009) | 0.003 (0.005) | 0.005 (0.012) | 0.024*** (0.004) | 0.001 (0.002) | 0.003 (0.006) | 0.004*** (0.001) | -0.001 (0.001) | -0.001 (0.001) |
| No. of observations | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 | 160 |
| R-squared | 0.5974 | 0.3443 | 0.4736 | 0.5493 | 0.3096 | 0.4060 | 0.5727 | 0.2746 | 0.4033 |

Notes: 1) *-significant at 10%, **-significant at 5%, ***-significant at 1%.

2) Standard errors are clustered by country.

3) Industry, country, region, and year dummies are not shown. The base industry is extractive. The base country is the U.S. for OECD and Venezuela for non-OECD. The base region is Oceania for the OECD countries and is Africa for the non-OECD countries. The base year is 2001.

Table 6: Industry Interactions

| | Dependent Variable: | | | TEADIFF | | | OPPDIFF | | | JOBSDIFF | | |
|-----------------|---------------------------|-----------|------------|---------|----------|------------|-----------|--------|------------|-----------|--------|------------|
| | | Coeff. | Std. Error | | Coeff. | Std. Error | | Coeff. | Std. Error | | Coeff. | Std. Error |
| 1. Rule | Rulediff | -0.001 | 0.001 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 |
| | Rulediff*ManUtility | -0.001 | 0.002 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 |
| | Rulediff*WhsleRetail | -0.013*** | 0.005 | 0.005 | -0.007** | 0.003 | -0.001 | 0.001 | 0.003 | -0.001 | 0.001 | 0.001 |
| | Rulediff*FinInsBusServ | 0.004** | 0.002 | 0.002 | 0.003** | 0.001 | 0.001*** | 0.001 | 0.001 | 0.001*** | 0.001 | 0.001 |
| | Rulediff*HealthEdConServ | 0.002 | 0.002 | 0.002 | 0.001 | 0.001 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 |
| | Constant | 0.000 | 0.003 | 0.003 | 0.012*** | 0.003 | 0.001*** | 0.003 | 0.003 | 0.001*** | 0.001 | 0.001 |
| | No. of observations | 465 | | | 465 | | 465 | | | 465 | | |
| | R-squared | 0.2861 | | | 0.2667 | | 0.4643 | | | 0.4643 | | |
| 2. Trust | Trustdiff | -0.001 | 0.008 | 0.008 | 0.003 | 0.005 | -0.001 | 0.009 | 0.005 | -0.001 | 0.009 | 0.009 |
| | Trustdiff*ManUtility | -0.006 | 0.006 | 0.006 | -0.003 | 0.004 | 0.000 | 0.001 | 0.004 | 0.000 | 0.001 | 0.001 |
| | Trustdiff*WhsleRetail | -0.056** | 0.021 | 0.021 | -0.029** | 0.011 | -0.001 | 0.003 | 0.011 | -0.001 | 0.003 | 0.003 |
| | Trustdiff*FinInsBusServ | 0.018* | 0.009 | 0.009 | 0.013** | 0.006 | 0.003*** | 0.001 | 0.006 | 0.003*** | 0.001 | 0.001 |
| | Trustdiff*HealthEdConServ | 0.002 | 0.016 | 0.016 | -0.001 | 0.007 | 0.001 | 0.001 | 0.007 | 0.001 | 0.001 | 0.001 |
| | Constant | 0.002 | 0.003 | 0.003 | -0.003 | 0.002 | -0.001*** | 0.000 | 0.002 | -0.001*** | 0.000 | 0.000 |
| | No. of observations | 465 | | | 465 | | 465 | | | 465 | | |
| | R-squared | 0.1696 | | | 0.1895 | | 0.4277 | | | 0.4277 | | |

Notes:

- 1) *-significant at 10%, **-significant at 5%, ***-significant at 1%.
- 2) Standard errors are clustered by country.
- 3) Industry and year dummies are not shown. The base industry is extractive.
- 4) Dependent variables are differences between a given country and the U.S. level by industry. U.S. level is 2001.