THE INFLUENCE OF ECONOMIC FREEDOM ON THE LIKELIHOOD OF SELF-EMPLOYMENT: A MULTILEVEL ANALYSIS

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ABSTRACT
Recent research has examined the relationship between economic freedom and measures of entrepreneurship. This paper extents on that research by using multilevel modeling, also known as random coefficient modeling (RCM), to examine how both country-level economic freedom and individual characteristics influence the likelihood of an individual being self-employed. Also, this paper examines the robustness of these relationships by running separate analyses using scores from both the Economic Freedom of the World index and the Index of Economic Freedom. Individual-level data obtained from the Global Entrepreneurship Monitor are used. Surprisingly, the results show a positive relationship between the government size/taxation level in a country and the likelihood of individual self-employment. A positive relationship is also found between the level of trade freedom in the country in which an individual resides and the likelihood that they are engaged in self-employment. Some support is also found for a negative relationship between both property rights and the level of business regulations in the country in which an individual resides and the likelihood that they are self-employed.

INTRODUCTION

Researchers have started to examine the influence formal institutions, often measures by economic freedom indices, have on entrepreneurship (Klapper, Laeven, & Rajan, 2006; van Stel, Storey, & Thurik, 2007, Wang & Wang, 2012). Similarly, this paper examines how the level of economic freedom in a country influences the likelihood that individuals are self-employed. Specifically, five components of economic freedom are used to predict individual self-employment: government size and taxation levels, the level of business regulations, trade freedom, property rights, and the soundness of money. Examining these relationships should be particularly relevant to policy makers if they are interested in pursuing policies that encourage self-employment.

This paper extents the current research on this topic by making use of random coefficient modeling (RCM), and using country-level and individual-level variables to predict individual self-employment. Most research that examines the relationship between economic freedom and entrepreneurship makes use of aggregate measures of entrepreneurship, such as the rate of self-

employment or the rate of new venture startups in a country or state (Bjornskov & Foss, 2008; McMullen et al., 2008; Sobel, 2008; Sobel, Clark, & Lee, 2007). Thus, individual-level measures of entrepreneurship are aggregated to the country- or state-level and used in a regression analysis as rates or averages. However, such aggregation can lead to inflated relationships and misinterpreted results (Luke, 2004; Tabachnick & Fidell, 2006). Using RCM avoids these problems, and also allows individual-level control variables to be easily added to the model. This paper also examines the robustness of the relationship between economic freedom and self-employment by modeling separate analyses using the two major cross-country economic freedom indices: (1) the Economic Freedom of the World index, published by the Fraser institute (Gwartney, Lawson, Sobel, & Leeson, 2007), and (2) the Index of Economic Freedom, published by the Heritage Foundation (2005). While similar, there are differences in how these two indices are constructed, and these differences may explain some of the varying results found in the literature.

This paper begins with a review of the literature concerning economic freedom and entrepreneurship. Hypotheses concerning how the different components of economic freedom influence the probability of individual self-employment are developed. Next, the sample, analysis technique and results are discussed. Finally, the findings are compared to those of similar studies and some limitations of the study are mentioned.

GOVERNMENT SIZE AND TAXATION

Government size may affect the costs and benefits associated with self-employment in several ways. Small governments require less tax revenue to operate. Large governments require more revenue and often tax businesses in a number of ways to generate the needed funds. For self-employed people, business profits are often taxed at personal income rates (Carroll, Holtz-Eakin, Rider, & Rosen, 2001). In countries with progressive income taxes, self-employed individuals with high incomes face high marginal tax rates (Wolff, 1998). These high tax rates may reduce the incentive for individuals engaging in entrepreneurship. In addition, governments may choose to tax the self-employed in ways other than income taxes. These include capital gains tax, user fees, business license fees, etc. (Bruce & Mohsin, 2006; Djankov, La Porta, Lopez-De-Silanes, & Shleifer, 2002). As governments grow larger, they will likely increase many of these different taxes in order to fund themselves. In addition to high taxes limiting the potential return of self-employment, they may also reduce people's ability to become self-employed because high taxes may exacerbate liquidity constraints (Fölster, 2002), giving people less capital to actually start businesses with.

Research examining the relationship between measures of taxation level and/or government size and measures of entrepreneurship yields mixed results. Wennekers, van Stel, Thurik and Reynolds (2005) found that the ratio of tax revenue to GDP is positively related to the nascent entrepreneurship rate across countries. However, several other studies find a negative relationship between government size/taxation levels and measures of entrepreneurship (Aidis, Estrin, and Mickiewicz, 2009; Bjornskov & Foss, 2008; Kreft & Sobel, 2005; Nyström, 2008).

H1: *There is a negative relationship between the size of government/level of taxation in the country in which an individual resides and the likelihood that he or she will be self-employed.*

BUSINESS REGULATIONS

Governments can regulate businesses in a number of ways: by making it difficult to obtain a business license, by setting price controls, or by restricting firm entry (Brunetti, Kisunko, & Weder, 1997; Gwartney et al., 2007). These sorts of regulations can vary widely across countries from arduous to halfhearted attempts at regulation. For example, meeting the government requirements for starting a business in Italy requires that the prospective entrepreneur perform 16 procedures, wait 62 days, and pay the equivalent of $3,946 in fees. Alternatively, in Canada this task can be performed in two days with an equivalent of $280 in fees (Djankov et al., 2002). Clearly, such regulations have direct and indirect costs and may play a large role in influencing new business startups.

Another way in which governments often regulate firms is by regulating the relationship between firms and employees. This is done through legislation of wages, such as forcing firms to pay overtime, making firms pay severance packages to dismissed employees, and protecting labor unions (Emerson, 1988; Freeman, 2007; Gwartney et al., 2007). These rules increase the cost to hire and maintain employment relationships. According to results from the Panel Study of Entrepreneurial Dynamics, the median firm plans to have two employees in addition to the owner within the first year of business operations (Human & Matthews, 2004). Consequently, the costs of hiring employees will likely influence individuals when deciding whether to start a new firm.

Some empirical studies have found that business regulation has no effect on entrepreneurship (Bjornskov & Foss, 2008; McMullen, et al., 2008). However, other researchers have found a negative relationship between the level of business regulations and measures of entrepreneurship (Klapper, et al., 2006, Nyström, 2008; Sobel et al., 2007; Van Stel, et al., 2007).

H2: *There is a negative relationship between the level of business regulation in the country in which an individual resides and the likelihood that he or she will be self-employed.*

FREEDOM TO TRADE

A country that lacks trade freedom will typically have high tariffs as well as non-tariff barriers, such as quotas, subsidies, and bans on trade (Gwartney et al., 2007). Although free trade has been expanding (Bergsten, 2001), some countries still have substantial restrictions on trade (Schnepf & Womach, 2008). The impact that trade freedom has on self-employment is not obvious, and not surprisingly, empirical research on the relationship between trade freedom and entrepreneurship has been mixed. Sobel et al. (2007) found that the average tariff rate is negatively related to total entrepreneurial activity, however, other research shows a non-significant relationship between trade freedom and measures of entrepreneurship (McMullen et al., 2008; Nyström, 2008).

In one sense, substantial trade restrictions may actually increase the opportunity for firms to produce goods and services for domestic consumption because protectionist measures may make it difficult for foreign firms to enter and operate in the market. This would allow domestic firms to charge higher prices or offer lower quality products (Dardis, Spivak, & Shih, 1985; Nguyen-Hong, 2000). On the other hand, free trade allows entrepreneurs more opportunities to sell their products or services to a wider market (Smith, 1976). Free trade between countries allows firms to specialize in producing a product or service and export their product or service around the

world. Firms that do businesses globally often start exporting early in their life (Moen & Servais, 2002), indicating that globalization may often be a part of the earliest plan for a new firm.

H3: *There is a positive relationship between the level of trade freedom in the country in which an individual resides and the likelihood that he or she will be self-employed.*

PROPERTY RIGHTS

Property rights structure the incentives in a way that helps internalize externalities (Demsetz, 1967). When the government protects private property, the court system enforces contracts, and there is little expropriation of property, property rights are viewed as being strong (Heritage Foundation, 2005). Well-defined property rights reduce the uncertainty regarding the use of property for individuals (Barzel, 1997; Demsetz, 1967). For example, a government seizing private property and failing to compensate the owner for it will impact the level of risk that property owner's face and will influence their behavior. As a result, property owners will tend to underinvest in improving their property. Likewise, individuals may want to avoid operating their own businesses when property rights are weak, since weak property rights makes holding substantial assets more risky. While Bjornskov and Foss (2008) failed to find a significant relationship between the quality of the legal system and entrepreneurial activity, other researchers have found a positive relationship between the strength of property rights and self-employment (McMullen et al., 2008; Nystrӧm, 2008).

H4: *There is a positive relationship between property rights protection in the country in which an individual resides and the likelihood that he or she will be self-employed.*

SOUND MONEY

An economy is said to have sound money when the inflation rate is low and has little volatility (Gwartney & Lawson, 2003). High volatility in the inflation rate makes planning for the future and making investment decisions difficult because the actual net present value of future projects will be difficult to determine (Huizinga, 1993) Also, when inflation is high, firms and individuals will likely be hesitant to enter into contracts, and those entered into will likely be shorter term (Rich & Tracy, 2004). This would seem to indicate that high inflation and a volatile currency would discourage self-employment, while sound money would encourage it. Empirical results have varied however, with Nystrӧm (2008), finding no relationship between sound money and self-employment, while McMullen et al. (2008) found mixed results. Conversely, Bjornskov and Foss (2008) found a positive relationship between sound money and entrepreneurial activity.

H5: *There is a positive relationship between the soundness of money in the country in which an individual resides and the likelihood that he or she will be self-employed.*

SAMPLE

A sample of individuals from the Global Entrepreneurship Monitor (GEM) survey from the years 2001 to 2009 is used. The GEM survey is a cross-country data collection project that surveys individuals about their engagement (or lack of engagement) in entrepreneurship (Reynolds et al., 2005). Each year, individuals were selected at random from a number of countries (Minniti et al., 2005). The GEM data were collected using both phone and face-to-face interviews. Respondents were selected using either random digit dialing or random selection of geographical clusters (Reynolds et al., 2005). Random digit dialing was used in countries in which a large proportion of adults had a landline phone, and the interview was conducted over the phone. Geographic

stratified sampling was used in areas in which landline phones were not owned by a large number of people in the population, and actual interviews were conducted face-to-face. The sample generally includes a minimum of 2,000 individual observations for each country for each year it was included in the sample, although there are many more observations for some countries (Reynolds et al., 2005). Surveyed individuals were asked a number of questions concerning how they perceive entrepreneurship, as well as if they were self-employed or were planning to become self-employed. If they were self-employed, they were asked some basic question about their business, such as how long they had been in business and the number of people their business employed at the time. The sample includes 773,326 individuals from the following countries: Algeria, Argentina, Austria, Belgium, Bolivia, Brazil, Canada, Chile, China, Colombia, Croatia, Czech Republic, Denmark, Ecuador, Egypt, Finland, France, Germany, Greece, Guatemala, Hong Kong (special administrative region of China), Hungary, Iceland, India, Indonesia, Iran, Ireland, Israel, Italy, Jamaica, Japan, Jordon, Kazakhstan, South Korea, Latvia, Lebanon, Macedonia, Malaysia, Mexico, Morocco, Netherlands, New Zealand, Norway, Panama, Peru, Philippines, Poland, Portugal, Romania, Russia, Singapore, Slovenia, South Africa, Spain, Sweden, Switzerland, Syria, Thailand, Tunisia, Turkey, Uganda, United Arab Emirates, United Kingdom, United States, Uruguay, and Venezuela. Countries were only included in the analysis if there were economic freedom scores published for them from both the EFW index and IEF, so that the results would be comparable.

DEPENDENT VARIABLE

The dependent variable used in this analysis is whether the individual is self-employed, regardless of the age of the business. The GEM survey measured this by asking individuals if they were owner-manager of a firm. The response is coded as a 1 if the individual was an owner-manager at the time and 0 if the individual was not.

INDEPENDENT VARIABLES

In order to test the robustness of the relationship between economic freedom and self-employment, this paper runs separate analyses using measures from both the Economic Freedom of the World (EFW) index (Gwartney et al., 2007) and the Index of Economic Freedom (IEF) (Heritage Foundation, 2005). Both indices have individual components that measure different aspects of economic freedom. The EFW is made up of five components: (1) size of government/taxation, (2) legal structure and security of property rights, (3) sound money, (4) freedom to trade, and (5) regulations of credit, labor and business. The measures used to derive the scores for these five components can be seen in Table 1. The Index of Economic Freedom index is made up of ten components: (1) business freedom, (2) trade freedom, (3) fiscal freedom, (4) government size, (5) monetary freedom, (6) investment freedom, (7) financial freedom, (8) property rights, (9) freedom from corruption, and (10) labor freedom. Table 2 displays the measures making up these ten component scores (Heritage Foundation, 2005).

Table 1

Component	Measures Used to Develop Component Score
1. Size of Government: Expenditures, Taxes and Enterprise	1A: General Government Spending as a Percentage of Total Consumption
	1B: Transfers and Subsidies as a Percentage of GDP
	1C: Government Enterprises and Investment
	1D: Top Marginal Tax Rate

	i: Top Marginal Income Tax Rate ii: Top Marginal Income and Payroll Tax Rate
2. Legal Structure and Security of Property Rights	2A: Judicial Independence (GCR)
	2B: Impartial Courts (GCR)
	2C: Protection of Property Rights (GCR)
	2D: Military Interference in Rule of Law and Political Process (ICRG)
	2E: Integrity of the Legal System (ICRG)
	2F: Legal Enforcement of Contracts (DB)
	2G: Regulatory Restrictions on the Sale of Real Property (DB)
3. Access to Sound Money	3A: Money Growth
	3B: Standard Deviation of Inflation
	3C: Inflation Most Recent Year
	3D: Freedom to Own Foreign Currency Bank Accounts
4. Freedom to Trade Internationally	4A: Taxes on International Trade i: Revenue from Trade Taxes ii: Mean Tariff Rate iii: Standard Deviation of Tariff Rates
	4B: Regulatory Trade Barriers i: Non-tariff Trade Barriers (GCR) ii: Compliance Cost of Importing and Exporting (DB)
	4C: Size of Trade Sector Relative to Expected
	4D: Black-Market Exchange Rates
	4E: International Capital Market Controls i: Foreign Ownership/Investment Restrictions (GCR) ii: Capital Controls
5. Regulations of Credit, Labor and Business	5A. Credit Market Regulations i: Ownership of Banks ii: Foreign Bank Competition iii: Private Sector Credit iv: Interest Rate Controls/Negative Real Interest Rates
	5B: Labor Market Regulations i: Minimum Wage (DB) ii: Hiring and Firing Regulations (GCR) iii: Centralized Collective Bargaining (GCR) iv: Mandated Cost of Hiring (DB) v: Mandated Cost of Worker Dismissal (DB) vi: Conscription
	5C: Business Regulations i: Price Controls ii: Administrative Requirements (GCR) iii: Bureaucracy Costs (GCR) iv: Starting a Business (DB) v: Extra Payments/Bribes (GCR) vi: Licensing Restrictions (DB) vii: Cost of Tax Compliance (DB)

Table 2

Components	Measures Used to Develop Component Score
1. Business Freedom	Starting a Business- procedures (number)- from the Doing Business survey (DB)
	Starting a Business- time (days) (DB)
	Starting a Business- cost (% of per capita income) (DB)
	Starting a Business- minimum capital (% of income per capita) (DB)
	Obtaining a License- procedures (number) (DB)
	Obtaining a License- time (days) (DB)
	Obtaining a License- cost (% of income per capita) (DB)
	Closing a Business- time (years) (DB)
	Closing a Business- cost (% of estate) (DB)
	Closing a Business- recovery rate (cents on the dollar) (DB)
2. Trade Freedom	Trade-Weighted Average Tariff Rate
	Non-Tariff Barriers (qualitative penalty)
3. Fiscal Freedom	Top Tax Rate on Individual Income
	Top Tax Rate on Corporate Income
	Total Tax Revenue as a Percentage of GDP
4. Government Size	Government Expenditures: $(100-.03*(\text{Expenditures/GDP})^2)$
5. Monetary Freedom	Weighted Average Inflation for Past Three Years
	Price Controls (qualitative penalty)
6. Investment Freedom	Restrictions on Foreign Investment (qualitative)
7. Financial Freedom	Banking Security and Independence From Government (qualitative)
8. Property Rights	Certainty of the Legal Protection of Property (qualitative)
9. Freedom From Corruption	Corruptions Perceptions Index (CPI)*(10)
10. Labor Freedom	Ratio of Minimum Wage to Average Value Added Per Worker (DB)
	Hindrance to Hiring Additional Workers (DB)
	Rigidity of Hours (DB)
	Difficulty of Firing Redundant Employees (DB)
	Legally Mandated Notice Period (DB)
	Mandatory Severance Pay (DB)

One issue in using these two economic freedom indices in separate analyses is that they need to be modified so that the individual index scores used are more comparable. Also, there are high correlations among component scores of the IEF, making using all ten component scores problematic. Thus, the Index of Economic Freedom is reduced from ten components to five components which match the five components of the Economic Freedom of the World index. The score for property rights and monetary freedom (equivalent to the EFW measure of sound money) from the IEF are used without modification. To obtain a value similar to the component of the EFW index for "size of government/taxation," the scores for the government size and fiscal freedom components from the IEF are averaged together. As can be seen by looking at the measures making up these components in Tables 1 and 2, combining the government size and fiscal freedom components from the IEF creates a component very similar to the "size of government/taxation" component from the EFW index. Likewise, to create a component equivalent to the "trade freedom" component in the EFW index, the trade freedom and investment freedom component scores from the IEF are averaged together. Finally, to obtain a component comparable to the EFW component representing freedom from "regulations of credit, labor and business" the components from the IEF for business freedom, labor freedom and

financial freedom are averaged together. These modified components from the IEF will be referred to as the modified Index of Economic Freedom components, and will be used in the analysis as equivalent to their comparable EFW index components.

The scores for the economic freedom components are values between 0 and 100 with the IEF, and between 0 and 10 with the EFW index. For these indices, high values represent more freedom. To make the results easier to interpret given the hypotheses, the EFW scores for the "size of government/taxation" and freedom from "regulations of credit, labor, and business" are reverse coded by subtracting the scores from 10. Likewise, reverse coding is done for the two equivalent modified IEF scores as well, by subtracting their respective scores from 100. Thus large now values represent large government size/taxation and high levels of regulation, instead of high values representing more freedom as they originally were scored in the indices.

CONTROL VARIABLES

Several individual-level variables that are likely to have an impact on the likelihood that an individual is self-employed are used as control variables. Gender is included in the model and coded as follows: 1=male and 0=female. Age is also included as a control variable. A variable representing age squared is included in order to capture a possible nonlinear relationship between age and self-employment, since both the very young and very old may be less likely to be self-employed. An individual's level of human capital influences the likelihood that they will engage in entrepreneurship as well (Bates, 1995; Davidsson & Honig, 2003). One common measure of human capital is the level of education that an individual has obtained. Three dummy variables are used to represent the highest level of education the individual has obtained. These categories are as follows: (1) Secondary school degree, (2) post-secondary degree and (3) graduate-level experience. A dummy variable for self-assessed entrepreneurial skills is included, with those stating they have entrepreneurial skills being coded as a 1. An individual's fear of failure is controlled for coding their response to the following statement: "Fear of failure would prevent you from starting a business?" Those responding "yes" are coded as a 1. A measure of country-level gross domestic product per capita from the World Bank World Development Indicators for each year is included as a control variable also (The World Bank, 2010). Dummy variables are included for each year (except 2001), creating year fixed effects in the model (Wooldridge, 2003).

ANALYSIS

The GEM survey data used in this analysis are individual-level responses, which are combined with country-level measures of economic freedom and GDP. To perform this analysis, random coefficient multilevel modeling is used. Much of the past research have used country-level measures of economic freedom to predict country-level rates of self-employment or nascent activity (Bjornskov & Foss, 2008; McMullen et al., 2008; Sobel et al., 2007). Conversely, the random coefficient multilevel modeling approach used predicts the probability that any individual will engage in self-employment, using individual-level as well as country-level characteristics. This allows for individual-level control variables, such as individuals' beliefs and perceptions about themselves, educational level, and gender to be added to the model (Luke, 2004).

Although in a purely country-level analysis individual-level variables can be aggregated to the country-level, such aggregation may lead to inflated relationships and misinterpretation if interpreted at the individual-level (Luke, 2004; Tabachnick & Fidell, 2006). The need for using

random coefficient modeling (RCM) can be assessed empirically by calculating intra-class correlations (ICCs). Using Hox's (2010) approach for calculating "pseudo-ICCs" for dichotomous dependent variables, a pseudo-ICC of .1051 (or 10.51%) is obtained. This is substantial enough that failure to account for this clustering could lead to inaccurate estimation of the standard errors of the parameter estimates (Kreft & De Leeuw, 1998), indicating that random coefficient multilevel modeling is appropriate.

To perform these analyses, the glmmPQL procedure from the R statistical software program is used (Venables & Ripley, 2002). This procedure is used because it can perform multilevel logistic regression, which is appropriate given the dichotomous dependent variable of self-employment. However, this procedure does not provide deviance scores, which are often used to evaluate model fit in RCMs. Thus, the discussion of these models will focus on the significance of the coefficients for the variables instead of model fit.

Table 3

Variable	Mean	Standard Deviation
Individual-Level		
Self-Employment	.123	.33
Gender (Male)	.467	.500
Age	43.33	15.66
Age Squared	2,122	1,477
Entrepreneurial Skills	.478	.499
Fear of Failure	.357	.480
Secondary Education	.311	.463
Post-Secondary Education	.223	.417
Graduate Experience	.139	.346
Country-Level		
GDP Per Capita	27,715	15,821
EFW Index Components:		
Government Size/Taxation	4.10	1.27
Business Regulations	2.85	.873
Trade Freedom	8.06	.905
Property Rights	7.43	1.57
Sound Money	9.07	.944
Modified IEF Components:		
Government Size/Taxation	43.53	16.84
Business Regulations	28.42	13.15
Trade Freedom	74.63	11.78
Property Rights	73.08	20.96
Sound Money	81.71	6.46

Table 4

Model:	*Control*			*EFW Index*			*Modified IEF Index*		
Variable	Coeff.	*t*	*p*	Coeff.	*t*	*p*	Coeff.	*t*	*p*
Intercept	-6.4128	-74.52	<.001	-7.0285	-30.75	<.001	-6.4052	-37.97	<.001
Gender (Male)	.4186	59.42	<.001	.4183	59.40	<.001	.4186	59.42	<.001
Age	.1497	95.40	<.001	.1498	95.46	<.001	.1498	95.40	<.001
Age Squared	-.0016	-89.77	<.001	-.0016	-89.80	<.001	-.0016	-89.76	<.001
Entre. Skills	1.6713	196.38	<.001	1.6710	196.40	<.001	1.6708	196.21	<.001
Fear Failure	-.3837	-49.21	<.001	-.3842	-49.28	<.001	-.3838	-49.20	<.001
Secondary Ed.	-.0080	-.85	.397	-.0113	-1.20	.229	-.0060	-.63	.526
Post Sec. Ed.	-.0351	-3.45	<.001	-.03412	-3.35	<.001	-.0324	-3.17	.002
Grad Exp. Ed.	-.0083	-.73	.464	-.0010	-.87	.386	-.0076	-.66	.507
GDP Per Capita	-.000009	-9.35	<.001	-.000007	-6.72	<.001	-.000007	-6.67	<.001
EFW Index:									
Gov. Size/Tax				.0233	2.15	.032			
Business Regs.				-.0989	-6.72	<.001			
Trade Freedom				.0763	4.42	<.001			
Property Rights				.0277	1.91	.056			
Sound Money				.0077	.59	.555			
MIEF Index:									
Gov. Size/Tax							.0041	3.21	.001
Business Regs.							.0018	1.46	.145
Trade Freedom							.0022	1.82	.069
Property Rights							-.0097	-7.61	<.001
Sound Money							.0027	1.91	.057
Year 2002	.1610	8.04	<.001	.1160	5.34	<.001	.1587	7.81	<.001
Year 2003	.6995	32.75	<.001	.6424	27.28	<.001	.6777	31.18	<.001
Year 2004	.6423	29.58	<.001	.6074	25.06	<.001	.6058	26.98	<.001
Year 2005	.7850	34.15	<.001	.7457	28.07	<.001	.7378	30.74	<.001
Year 2006	.6272	27.16	<.001	.5987	23.49	<.001	.5669	22.99	<.001
Year 2007	.8003	31.58	<.001	.7679	28.20	<.001	.7341	25.85	<.001
Year 2008	.8432	32.03	<.001	.8305	29.66	<.001	.7847	26.74	<.001
Year 2009	.8200	34.81	<.001	.8199	32.37	<.001	.7610	27.43	<.001

RESULTS

The means and standard deviations of all the variables can be seen Table 3
Table 4 contains the results from the random coefficient multilevel model, showing the coefficients for each of the variables and their associated t-values and p-values. The results from the following three models are included in Table 4: (1) control model (2) model using the EFW index components and (3) model using the modified IEF components that are comparable to the EFW index components.

Model 2 which uses components of economic freedom from the EFW (Economic Freedom of the World) index, the coefficient for taxation/government size is a statistically significant (.0233; *p =.032*). However, the relationship is positive unlike the negative one hypothesized, thus hypothesis 1 is not supported. The coefficient for the level of business regulations is negative and statistically significant (-.0989; *p <.001*), supporting hypothesis 2. The coefficient for the trade freedom component is positive and statistically significant (.0763; *p <.001*), which is consistent with hypothesis 3. Property rights is positively related to the likelihood of self-employment but is only marginally significant (.0277; *p =.056*) showing some support for hypothesis 4. Finally, sound money is not significantly related to self-employment (.0077; *p =.555)*; thus hypothesis 5 is not supported using the EFW index component score.

Model 3, which uses the modified Index of Economic Freedom (IEF) components, the coefficient for taxation/government size is statistically significant (.0041; *p =.001*), but in the opposite direction hypothesized. Thus, there is no support for hypothesis 1. The coefficient for the level of business regulations was not statistically significant (.0018; *p =.145*) and therefore hypothesis 2 is not supported. The coefficient for trade freedom was marginally significantly (.0022; *p = .069)* lending some support to hypothesis 3. Property rights are significantly related to the likelihood of self-employment (-.0097; *p <.001*), but the relationship is negative. Because this is the opposite of what was hypothesized, hypothesis 4 is not supported. The coefficient for sound money is positive and marginally significant (.0027; *p =.057*), showing some support for hypothesis 5.

DISCUSSION AND LIMITATIONS

The results of this paper provide an interesting comparison to other studies and prevailing theory regarding how economic freedom influences self-employment. A positive relationship is found between government size/taxation levels and the likelihood of self-employment with both the EFW index component and modified IEF component. Past empirical research examining this relationship has found mixed results, with some finding negative (Nyström, 2008) and other studies finding positive relationships (Aidis et al., 2009; Bjornskow & Foss, 2008; Wennekers, et al., 2005). A negative relationship is found between the level of business regulations and the likelihood of self-employment using the EFW index component score, while a non-significant relationship is found using the modified IEF component score. Our results, at least with the EFW index score, is consistent with a number of previous studies (Klapper et al., 2006; Sobel et al., 2007; Nyström, 2008, Van Stel et al., 2007).

Trade freedom is positively and significantly related to the likelihood of self-employment with the EFW component score, while marginally significant with the modified IEF component score. While some past research has found a non-significant relationship (McMullen et al., 2008; Nyström, 2008) our results are consistent with the findings of Sobel et al. (2007). A positive marginally significant relationship is found between property rights and the likelihood of self-employment with the EFW index component score, but a strong negative relationship is found using the IEF component score. This is a somewhat puzzling result and inconsistent with some previous findings and prevaling theory (McMullen et al., 2008; Nyström, 2008). The relationship between sound money and the likelihood of being self-employed was not significant with the EFW index component score, but was marginally significant (and positive) using the modified IEF component score. The results in the literature have been inconsistent as well, with Nyström (2008), finding no significant relationship, while Bjornskov and Foss (2008) found a positive relationship.

There are some limitations to this research. Although the GEM survey contains many cross-country respondents, it does not include respondents from a number of countries. This is a limitation because the determinants of entrepreneurship in Europe are likely to be much different compared to other parts of the world, such as Africa. Due to this, the results may have limited generalizability. This study uses measures of economic freedom to predict self-employment, however, increased self-employment is not always desirable. This study does not fully capture how economic freedom influences the type of entrepreneurship that people engage in. Baumol (1990) argues that even if institutional forces do not change the level of entrepreneurship in an economy, they certainly do change the type of entrepreneurship that occurs. Thus, economic freedom may influence the relative ratio of productive entrepreneurship to unproductive and destructive entrepreneurship. However, due to limitations in the GEM survey, it is difficult to determine whether a self-employed individual is engaging in productive or unproductive forms of entrepreneurship.

CONCLUSION

This paper examines the relationship between the economic freedom in a country and the likelihood of individuals being self-employed. Measures of government size/taxation level, the level of business regulation, trade freedom, the strength of property rights, and the soundness of money are taken from both the Economic Freedom of the World index and the Index of Economic Freedom. Opposite of what was expected, the results show a positive relationship between the government size/taxation level in a country and the likelihood that individuals in that country are self-employed. A positive relationship is found between the level of trade freedom in the country in which an individual resides and the likelihood that they are self-employed. Depending on the index used, some support is also found for a negative relationship between both property rights and the level of business regulations in the country in which an individual resides and the likelihood that they are self-employed. This indicates that some of the inconsistent results found in the literature may be simply due to the use of different measures of economic freedom.

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