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THE IMPACT OF ECONOMIC FREEDOM
ON ENTREPRENEURS' ACTIVITIES
AND ECONOMIC GROWTH: NEW EVIDENCE
FROM CROSS-COUNTRY DATA

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Abstract

This paper's purpose is to study the moderating effect of economic freedom on the relationship between entrepreneurial activities and economic growth. Accordingly, the paper's objective is two-fold. First, it attempts to test the empirical validity of the interrelation between entrepreneurial activities and institutional settings to accelerate growth. Second, it assesses the impact of main economic tools that may affect entrepreneurial activities across countries. On the basis of the results, the mostly unfree countries suffer from economic stress that reflected in their inflation and taxes as well as in the many challenges that entrepreneurial activities face that hinder their moderating effect on the economic growth. The paper is valuable to policy makers in developing countries especially the mostly unfree countries in their pursuit of achieving economic growth and higher employment level. The paper shows the significant role of improvement in the entrepreneurial activities related with economic freedom in free countries and noteworthy lags in others. A cross-countries' study clarifies the important role for entrepreneurial activities and the need to restructure policies within the mostly unfree countries to accelerate growth.

ملخص

هدف هذه الورقة هو دراسة تأثير الحرية الاقتصادية على العلاقة بين أنشطة تنظيم المشاريع والنمو الاقتصادي. وفقا لذلك، يتكون هدف الورقة من شقين. أولا، تحاول اختبار صحة العلاقة التجريبية المتبادلة بين أنشطة تنظيم المشاريع والأطر المؤسسية لتسريع النمو. ثانيا، تقوم بتقييم تأثير الأدوات الاقتصادية الرئيسية التي قد تؤثر على أنشطة تنظيم المشاريع في مختلف البلدان. وعلى أساس النتائج، نجد أن معظم الدول غير الحرة تعاني من الإجهاد الاقتصادي الذي ينعكس على معدلات التضخم، والضرائب، وكذلك في العديد من التحديات التي تواجه أنشطة تنظيم المشاريع التي تعيق الأثر على النمو الاقتصادي. تعد هذه الورقة ثمينة لصانعي السياسات في معظمها وخاصة الدول غير الحرة والبلدان النامية في سعيها لتحقيق النمو الاقتصادي وارتفاع مستوى التشغيل. وتظهر الورقة الدور الكبير في تحسن في أنشطة تنظيم المشاريع ذات الصلة مع الحرية الاقتصادية في الدول الحرة. كما توضح الدراسة وعبر البلدان الدور الهام للأنشطة لتنظيم المشاريع والحاجة لإعادة هيكلة السياسات داخل البلدان غير الحرة في الغالب إلى تسريع وتيرة النمو.

1. Introduction

The debate regarding the relationship between economic freedom and entrepreneurial activities (EA) has generated a vast theoretical and empirical literature in recent years. Traditional scholars relate EA to small businesses and they emphasize the role they play in accelerating economic growth. Somewhat more recently, scholars have been more concerned with exploring the differences across countries and the reasons behind these differences (Schmitz 1989; Grossman and Helpman 1994; Barro and Sala-i-Martin 1995). Among other things, the interactions between the entrepreneurship, trade and recent innovative investments have led researchers to explore the role that entrepreneurship plays in stimulating and generating economic growth (Jovanovic 1982; Audretsch 1995; Cohen and Klepper 1996).

While studies have tried to explain the role of EA as an engine of economic growth, only a handful of studies have been undertaken to analyze the differences across countries and over time. Some countries attract entrepreneurs while others prevent them from starting up any business. However, the relationship between entrepreneurship and economic freedom in general and growth in particular has largely been missing in the empirical studies and related literature.

This study's contribution is based on assessing the interrelation between the entrepreneurial activities, economic freedom and growth across countries. A data set for 67 countries covering a period from 2004 to 2008 is prepared and each country is classified according to their economic freedom level to form three groups of countries. The first group represents five free countries[1], second represents forty-two mostly free countries [2], and the third group represents twenty mostly unfree countries 3. The paper employs the fixed and random estimates, followed by Generalized Method of Moments estimation methodology, which is preferred for studying the dynamics of change with relatively short time series.

Moreover, the findings provide a set of policies for governments to undertake tenable actions to accelerate the effectiveness of the institutional setting. The structure of the paper is designed as follows. Section 2 presents the link between entrepreneurial activities, economic freedom and growth. Section 3 describes the empirical model and discusses the results. Section 4 concludes with the main findings and proposes a set of policy recommendations for countries targeting to enhance EA.

2. Literature Overview

The multiple impacts of entrepreneurship via operational functional, production, per capita income, employment, standard of living, innovation and capital accumulation attract numerous researchers to explore these links. This section focuses on the hypothesis of the changing role of the entrepreneurship across theories. It starts by defining entrepreneurship, followed by a brief to theories.

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[1] This group of countries is characterized by having an efficient and transparent regulatory legal framework. There is sustained engagement in global trade and investment, with a highly motivated and skilled labor force, which is the cornerstone for the dynamic economies. These countries score more than 80% in achieving economic freedom.

[2] The second group of countries consists of the mostly free and moderately free countries, there scores range between 80 to 60 % in freeing economic institutions. The ranking of these countries changes according to their performance from one year to another but at the end remains within the mostly free and moderately free.

[3] The third group represents the countries were the ranking is less than 60 % in the setting for economic freedom. The majority of these countries are implementing economic reform to correct the economic imbalances. Many countries are facing a poor judicial system, which minimizes the governments' abilities to protect property rights. In addition, to the adoption of protectionism policies, such policies limit the economic freedom and create a fertile land of corruption hindering investment and hurt economic growth.

2.1 Defining Entrepreneurship

Taking an historical perspective of entrepreneurship provide highlights to its role and impacts. Cantillon (1755) claimed that entrepreneurship is the economic agent, making decisions on market interactions in the face of uncertainty. In 1921, Knight built upon Cantillon's idea of the risk-bearer and introduced his own 'entrepreneur', whose primary objective was to deal with uncertainty and risk. Just a decade after Knight's publication, Schumpeter (1934) introduced the entrepreneur as an agent to growth, who through the process of innovation, brought about social change and economic development. Furthermore, he distinguished five manifestations of entrepreneurship, "a new product, a new method of production, a new market, a new source of supply of intermediate goods, and a new organization" (Schumpeter 1934, in Karlsson, Friis & Paulsson 2005: 88-89). Schumpeter's definition therefore equates entrepreneurship with innovation in the small business sense; that is identifying market opportunities and using innovative approaches to exploit them. Entrepreneurship is studied in the relevant literature in terms of these definitions both at the micro level, i.e. at the level of the individual firm or entrepreneur, and at the macro-level. In the latter case, the rate of small firms, young firms, new firms or entrepreneurship can be measured in regions or at the national level. But how did we arrive at these definitions? In line with the Schumpeterian entrepreneur, the definition of the entrepreneur as being a market entrant (or a young firm that has recently entered the market) is straightforward and these definitions – entrants or young firms – are often employed in entrepreneurship research.

In1973, Kirzner stressed the role of entrepreneur in a competitive market process; this notion implies that every firm on the market achieving profitable business is an entrepreneur. Holcombe (1998) claims that Kirzner and Schumpeter's view of entrepreneurs are not different. Both benefit from the unexploited profit opportunities and Kirzner's view focus on the function of the entrepreneurs. Later, Wennekers et al. (1997) and Wennekers and Thurik (1999) developed the entrepreneur's definition to the one who can compete with others for a share of the market, and create economic opportunities based on their decisions. Defining entrepreneurship as a small firm might be misleading, as large firms might exhibit entrepreneurial and innovative characteristics. From this, an alternative classification emerged by Wennekers and Thurik (1999), differentiating between three types of entrepreneurs. The first type is the Schumpeterian entrepreneur who mainly operates in small, independent firms. Second are the Intrapreneurs, these are the innovators and creative leaders, both of whom gain their advantages from creative destruction. The third type of entrepreneur is the managerial business owner, whose focus is on the coordination of production and distribution across economic activities. Accordingly, Gartner (1990) listed 90 different attributes of the entrepreneur. This paper defines entrepreneurship as the activities of an individual or a group aiming at initiating economic enterprise in the formal sector under a legal form of business.

2.2 Entrepreneurship and growth – theoretical and empirical studies

Historical views link entrepreneurship and economic growth with various fields of economics and management study, including economic history, industrial economics and management theory. The interrelation between disciplines attracts researches to uncover these relations. Schumpeter (1934) in his seminal book *The Theory of Economic Development* argued that not all businessmen are entrepreneurs; they must be innovators and a catalyst to the production process by adopting new technology. In 1956, Solow stressed the contribution of technological innovation to national economic growth. Despite the fact that he does not mention the entrepreneur's role in his theory, The emphasizes the effective role of labor due to its impact on growth. Effective labor includes knowledge and this effective labor with capital can increase output. If either capital or effective labor increases, growth can be achieved. Here advances in knowledge or technological progress determine the growth.

Furthermore, researchers have begun to study the endogenous factors affecting growth through technical change resulting from decisions of profit-maximizing agents. The latest class of models developed in this tradition has arisen from the works of Romer (1986, 1990), and Lucas (1988). Later, endogenous growth models highlight the importance of knowledge as a determinant to economic growth, while the new endogenous growth model pioneered by Romer (1990) identified some attributes of entrepreneurship by modelling the process of invention and deriving the motives for invention from the microeconomic level.

Researchers on pre-20th century economic history show that entrepreneurs adopted new production techniques, reallocated resources to new opportunities, diversified output and penetrated new markets via competition. In the mid-20th century, the entrepreneurship role declined in the light of large-scale production and efficiency. In the last two decades, the knowledge and information revolution has renewed theoretical thinking linking entrepreneurship to growth with new theories emerging from the field of industrial evolution or evolutionary economics (Jovanovic 1982; Audretsch 1995). Evolutionary economics views entrepreneurs as agents of change, who bring new ideas to markets and accelerate growth through a process of competitive firm selection. Wennekers and Thurik (1999) showed that the general innovative role of entrepreneurs includes not only newness (implementing inventions), but also new entry (start-ups and entry into new markets).

The above overview suggests several immediate determinants of entrepreneurship. In addition to the previously mentioned determinants, institutions are often perceived as a major determinant of economic growth. According to North (1990), there is an even more explicit relation between economic growth and the entrepreneur in the context of the institutional framework. In 1993, William Baumol emphasized the institution's role in encouraging the productive entrepreneurship, which can be identified as a primary source of economic growth; it is also responsible for the creation of additional output. Wennekers and Thurik (1999) agreed with Baumol on principle that the major foundation of long-term economic growth lies with proper, motivating institutions rather than simple growth accounting. Consequently, the role of good institutions can be clearly asserted from this theory (Boettke & Coyne 2003; ACS & Virgill 2010).

Empirical studies of entrepreneurship and its relationship to economic growth are all relatively recent. Most empirical studies, nevertheless, focus primarily on a single aspect of entrepreneurship, as it is the most difficult from the operational point of view to conduct research, and it could fully encompass the totality of the entrepreneurial activities in growth. Researchers try to use different measures for entrepreneurship such as business ownership rate, entry rate, and self-employment rate. Since 1990s, the rate of business ownership has been increasingly used as reliable measure. For instance, the entrepreneur is often defined as one who starts his / her own, new and small business at his / her own risk. Entrepreneurs are here defined as those who initiate activities; however they are individuals or a group of people whose goal is to initiate economic enterprise in the formal sector under a legal form of business.

Entrepreneurship, therefore, can manifest itself in a number of ways, one of which is innovation. Salgado-Banda (2005) has measured innovative entrepreneurship using quality adjusted patent data. He concluded that a positive influence on growth could be asserted for the 22 OECD countries he has studied. Lee, Dlorida and Acs (2004) support similar results through studying the American economy. Another important feature of entrepreneurship can be described as business ownership. Wennekers and Thurik (1999) in their cross-sectional study of 23 OECD member countries covering the period 1984 – 1994 provided empirical evidence of the role of entrepreneurship, as measured by business ownership rates, with higher rates of employment growth at the country level. Later, Carree and Thurik (1999), followed by

Audretsch et al. (2002), concluded that those OECD countries present evidence for higher increases in entrepreneurship, exhibited through business ownership rates, and they are the ones that have enjoyed lower unemployment and greater rates of economic growth. In most of these studies, the commonly used proxy for measuring entrepreneurship was the business start-up rate. Acs and Armington (2002) have investigated the relative contribution of new start-ups to job creation. Their findings suggest that new firms may have a far greater role in new job creation than previously thought. Creating jobs can be directly linked to economic growth and supporting entrepreneurial activities is a powerful force driving innovation, productivity, job creation and economic growth. The effect of entrepreneurial activity on economic growth depends upon the level of per capita income and economic growth. Depending on macro data available, one could use proxies to capture a single feature and its level as a measurement of entrepreneurship. Commonly used proxy variables would include business start-ups or self-employment (Klapper and Quesada Delgado 2007; Naude 2008).

Recently, Fisher and Reuben (2010) used a number of entrepreneurship variables, including business birth rates, death rates and survival rates. All these variables proved significant and exhibit positive impact on growth rates, with the exception of business death rates, which is negatively related. They concluded that countries with a high level of entrepreneurial activity tend to be better economically. Nonetheless, "recent empirical studies suggest that entrepreneurship – measured as start-up rates, the relative share of SMEs, self-employment rates, etc. – is instrumental in converting knowledge into products and thereby propelling growth" (Braunerhjelm 2010).

2.3 Economic freedom, institutional theory and entrepreneurial activities determinants

The potential determinants of entrepreneurship are several and cover a wide range of theories; this wide spectrum of approaches is referred to the overlapping role of entrepreneur. Literature differentiates between the levels of analysis. At the micro level researchers focal point on the decision making process by individuals to become self-employed, (Reynolds, Miller & Maki, 1995, Blanchflower and Oswald, 1998). While, on the macro level entrepreneurship, determinants are explained by demand side factors (named push factors) and supply side factors (named pull factors), Push factors, or the demand side factors represent technological developments, the industrial structure of the economy, government regulation, and the stage of development. These represent the driving forces for entrepreneurship demand, (OECD 1996; Wennekers and Thurik 1999; Wennekers et al. 2002).

On the other hand, it has been argued that technological developments retard the level of entrepreneurship, reasoning that technological development may or may not create a barrier for new entry to business. Researchers found that technological developments are considered to be one of the driving forces in the demand for entrepreneurship (Casson, 1995; OECD 1996; Wennekers and Thurik 1999; Wennkers et al. 2002).

In recent years, Blomstrom and Kokko (1997) argued that the effect of foreign direct investment inflows provide economic benefits to a country through greater labour productivity, transferring new technology offering business opportunities. In regards to the relation between the stage of economic development and entrepreneurship, results are mixed. Bregger (1996) argued that economic development could be achieved when there is a decrease in the self-employment rate. Further, Carree et al. (2002) pointed out that economic development is usually accompanied by an increase in the wage levels. The stage of economic development is by proxy using GDP per capita.

Concerning the pull factors or the supply side factors of entrepreneurship, these are determined by demographic characteristics of the population, income levels, educational attainment, unemployment level, cultural norms and institutional setting (i.e., access to finance, administrative burdens, and the degree of taxation). Reynolds, Hay, and Camp (1999) listed

out why education is vital for entrepreneurship. First, education provides an individual with the necessary skills and qualifications. Second, education creates awareness for career alternatives. Third, education provides knowledge that can be used by individuals to develop opportunities. Furthermore, recent studies by Blanchflower et al. (2000) found that the level of education has a negative effect on the probability of an individual selecting self – employment. They reasoned this as the highly educated people may not be a willing risk taker, and this result is supported by van der Sluis et al. (2005).

Concerning the impact of unemployment on entrepreneurial activities, the relation was found to be ambiguous. Storey (1991) explains this ambiguousness with the methodology employed in his research. He provided a positive relation between unemployment and the decision to start a new business using time-series studies, while a negative relation is found in cross-sectional or pooled cross-sectional studies. Evans and Leighton (1990) and Foti and Vivarelli (1994) found that the probability of starting a business raises unemployment. The unemployment rate is used as a proxy for unemployment. Adding to the previous determinants, income dispersion has been found to have significant impact on entrepreneurial activities. This is associated with entrepreneurs' ability to cover the risks with self-employment and starting a new business. Empirical studies by Ilmakunnas, Kanniainen and Lammi (1999); Bosma, Wennekers, de Wit and Zwinkels (2000) provide evidence for the positive relation between income disparity and self-employment.

Finally, from the core determinants comes the institutional setting. Bjornskov and Foss (2008) argued that institutional features, such as size of the government, the degree of administrative complexity, the tax system, the intellectual property rights regime, the level of trust, corruption, and availability of finance capital can affect the level of entrepreneurship in a country. Bureaucracy costs and regulations affect entrepreneurial activities. In a study of OECD countries fewer individuals become entrepreneurs when the start up cost are higher, (Fonseca et al. 2001). Related empirical studies find that well-defined rules and regulations, well – protected rights, sound government, less corruption and an efficient judicial system promote entrepreneurship (Morck, Yeun and Yu 2000; Johnson, Mc Milan and Woodruff 2000, 2002). In this paper the overall economic freedom index is employed as a proxy for the institutional setting.

According to Henriquez, Verheul, Van der Knapp and Bischoof (2001) the level of tax system negatively affects the level of entrepreneurship. Moreover, Henrekson (2005) also points out that higher rates of personal taxation discourage the market provision of goods and services that substitute closely for home-produced services. In this paper the total tax rate (% of commercial profits) is employed to capture the effect of taxes on entrepreneurial activities. More importantly, researchers suggest that a firm's investment decisions are highly sensitive to the country's institutions and policies. Such policies, by affecting the business climate, can either promote or deter firms' willingness to enter or stay in the market. Volatile macroeconomic policies increase the financial risk and raise the risks of using financial hedging instruments. In this paper the average GDP deflator is employed to capture the volatility of monetary policies.

3. Data and Methodology

3.1 Data

This paper endeavors to find the moderating effect of economic freedom (EFI) on the relationship between entrepreneurial activities (EA) and economic growth. In order to analyze this effect, the set of countries is split into three groups using the economic freedom index during the period of 2004 – 2008. The reason behind this relatively short interlude is that for most cases there is no other data available. The first group represents free countries (scores

more than 80 %), second represents mostly free countries (scores less than 80% to 60%), and finally mostly unfree countries (scores less than 60%), see table 1 in the appendix.

The paper specifically uses a dynamic panel model (DPD) with a relatively short time dimension. The preferred method is the system GMM estimator, using Barlett kernel, Newey-west fixed method. The latter is similar to a systems GMM estimator, which uses one equation in levels and replaces the first difference equation of the systems GMM. Thus, the lagged endogenous model is the considered specification of the dynamic model for aggregating entrepreneurial activities.

$$EA = \alpha_0 + \beta \ (EA_{t-1}) + \alpha_1 \ (EFI_t) + \alpha_2 \ (MI)_t + \varepsilon \ t. \hspace{2cm} (1)$$

Where EA $t-1$ and EA t represent the actual and previous entrepreneur activities, EFI represents the rank of economic freedom index, MI is the macro variables and εt is an error term. The specification in equation (1) is frequently called lagged endogenous model, where the lagged endogenous variable can represent the inertia of the system. Taking equation one as the point of reference, the DPD model for (EA) can be specified with some additional explanatory variables, such as gross domestic product per capita, inflation, and taxes.

In order to see the advantage of considering an appropriate procedure such as GMM to estimate our DPD model, a comparison of the GMM with traditional panel procedures, fixed and random estimates as well as with the GMM approach is shown. GMM estimates are shown for the one-step estimator case, with heteroskedasticity-consistent asymptotic standard errors reported[4]. The data for entrepreneurial activities is from the 2010 World Bank Entrepreneurship Snapshots (WBGES) 6, which defines entrepreneurship as the activities of an individual or a group whose aim is to at initiate economic enterprise in the formal sector under a legal form of business. As previously discussed the set of possible determinants of entrepreneurship is very large indeed, including the size of the government, the degree of administrative complexity/bureaucracy, the tax environment, the intellectual property rights regime, the enforcement of property rights in general, the level of trust, competition law, political freedom, labor laws, social security regime, bankruptcy law, corruption, crime, the ethnic composition of the population, availability of finance capital, etc. Some of these have been examined in previous work (Grilo and Thurik 2004; Bjornskov et al. 2008). Data is for the independent variables such as GDP per capita, total tax rate, and inflation.

$$EA_{i,t} = \alpha_0 + \alpha_1 \ EFI_{i,t} + \alpha_2 \ GDPC_{i,t} + \alpha_3 \ INFL_{i,t} + \alpha_4 \ TAXR_{i,t} + \varepsilon_{i,t}. \hspace{1cm} (2)$$

The subscripts denote the country i and the time period t. Table 2 summarizes the variables used in the estimation of the model, with their respective descriptive statistics.

3.2 Empirical results

To measure this moderating effect a traditional fixed and random approach [5] and GMM model are employed to explain the role of economic freedom on entrepreneurial activities and economic growth relations. The paper starts with the panel unit root tests followed with the traditional procedures for estimating cross sectional depending on the unit root test results. These results recommend employing the traditional approach later. The GMM approach is used to assess for the role of the main economic variables on the EA.

The variables properties need to avoid the possibility of spurious regressions. In order to assess the stationary of the variables employed, this paper employs five different unit root tests

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[4] The reason for applying the traditional approach is to compare the traditional approach and the GMM approach, which allows handling the endogeneity problem. Second, the data we pooled and examined by the GMM estimates.

[5] Statistically the fixed effects model allows for heterogeneity among subjects by allowing each entity to have its own intercept value, and it always give consistent results, although they may not be efficient; while the random effect model generates better p- values as it is a more efficient estimator, Gujarati and Porter (2009).

including LLC's test (Levin et al. 2002), IPS-W-statistic (Im et al. 2003), ADF-Fisher Chi-square (Augmented Dickey Fuller 1979), and PP-Fisher Chi-square tests (Phillips and Perron 1988). The results of these tests are reported in Table 3 indicating the statistics significantly of the variables, as they are stationary at the level values especially for the LLC's test at the 10%.

Using the set of variables in equation one and by applying the fixed, random effects methodology, results for the three groups of countries shows the positive significant relationships between EA and EFI in the three groups, but the level of significance is 1% in the first group and 10 % in the other two groups. The sign of the coefficients estimated support previous literature and previous empirical studies. Tests provide a positive significant relationship between the EA and economic growth in the first group at a significant level 1% but for the mostly free and less free groups the relation is insignificant. While the unemployment rate shows a negative significant relation with the EA at 1% level of significance in the first group, in the other two groups the relation is insignificant, (see Table 4). Results support the research hypothesis of the important role of economic freedom to entrepreneurial activities across the three groups with different level of significances and support literature concerning the importance of economic freedom and institutional measures (Wnnekers and Thurik 1999; Wennekers et al. 2002; Berggren 2003; Bjørnskov et. al. 2006).

Turning to policy variables of the role of tax system and impact of inflation, estimate results show for the tax system a positively significant relationship between entrepreneurial activities (EA), EFI and the tax policy, at significant level of 1%, while, results show a negative significant relation between the (EA) and the tax system in the second group with level of significance of 1% and 10 % in the less free group. Reflecting the importance of the tax system, as it represents an important role for attracting entrepreneurial activities, the tax system plays a positive role in free countries while it is less effective in the other two groups, and impacts negatively on EA, (see Table 6). Moreover, traditional results support the previous test and present a positive significant relationship between EA and EFI and between the EA and GDP per capita with level of significance of 1% in the free and mostly free groups, while these relations are absent in the less free group.

First group results support the research hypothesis of the importance of the government freedom, transparency, credible laws and regulation that protect investors and maintain a safe and profitable economic environment through a transparent economic and institutional setting. The results provide a positive significant relationship between the EA and EFI, EA and GDP per capita, and the tax system with significance level of 1%, (see Table 6). Worth mentioning, that this group is characterized with small populations, which helps the government to achieve the planed policies. For example in Hong Kong there is no import tariff and revenue duties are levied on locally manufactured or imported products, which motivates entrepreneurial activities. Concerning the inflation rate there is a significant negative relationship with EA, a result supported by the literature.

In the second group, which is characterized by mostly free countries, results provide a positive significant relationship between entrepreneurial activities (EA), and the economic freedom index (EFI). Concerning the relation between EA, the tax rate and, the inflation rate, the results provide a negative insignificant relation. In the third group, which is characterized as mostly unfree countries, results present a positive significant relationship between EA, the economic freedom index and, economic growth, while applying GMM cross sectional analysis results provide a significant negative relationship between EA and the EFI at a10% level. However, there is a negative significant relationship between EA and economic growth at a 10% level, and a negative insignificant relationship between EA, the inflation rate, and tax policy.

Based on the result shown in Table 5 the fixed and random effects seem to give downward biased estimates of the coefficient for the economic freedom index of 0.52 and 0.17 for the

first and second group. Using the GMM approach among the three groups provides a downward - biased estimate coefficient of the β coefficient for EFI, while the pool panel data is robust. The results support the literature as to the importance of the institutional setting to economic growth and to attracting more entrepreneurial activities. Moreover, to avoid any inconsistency and to assess the moderating effect directly, a merge to the three groups is applied, targeted to increase the potentially of the estimators' efficiency. A descriptive summary for the parameters is represented in Table 5, showing the normality of the variable. Results for pooled countries are presented in Table 6, showing the positive significant relation between the EFI, EA, and economic growth. Both the tax policy and the inflation rate provide a negative significant relation with EA.

4. Conclusion

This paper has examined whether economic freedom moderates the relationship between entrepreneurial activity and economic growth using data from 67 countries by applying the fixed and random effects in addition to the GMM techniques. The results show that economic freedom does not moderate the entrepreneurial activity -growth connection in mostly unfree countries while it plays a vital role in free and mostly free countries.

On the basis of the results, the mostly unfree countries suffer from economic stress that reflects on their inflation and tax system. Entrepreneurial activities face many challenges that hinder their moderating effect on the economic growth in free countries to the extent that the interaction between economic freedom and entrepreneurial activity does not significantly influence economic growth. This paper asserts the current economic policies and the level of entrepreneurial activity lack the required potency to accelerate economic growth in less free countries. Therefore, it is strongly recommend that mostly unfree countries should review their tax policies, institutional settings, and regulations via targeted entrepreneurship-development programs. In less economically free countries economic growth is at risk if there is not a push toward more transparent, credible and genuine system reforms.

Finally, this paper faced three limitations data set covers only 67 developed developing and transition countries. Second, the period under investigation includes only the years from 2004 and 2008, but this limitation is not due to the selection of the countries but rather due to source of the entrepreneurship data. Third, was the difficulty in measuring operational entrepreneurial activities.

References

Aghion, P. and P. Howitt.1992. "A Model of Growth through Creative Destruction." *Econometrica* 60:323–351.

Acs, Z., & Armington, C. 2002. *Economic Growth and Entrepreneurial Activity.* Washington D.C.: Center for Economic Studies, U.S. Bureau of the Census.

Acs, Z. J., & Szerb, L. 2009. "The Global Entrepreneurship Index (GEINDEX)." *Foundations and Trends in Entrepreneurship* 5 (5): 341-435.

Acs, Z. J., & Virgill, N. 2010. "Entrepreneurship in Developing Countries." *Foundations and Trends in Entrepreneurship* 6 (1), 1-68.

Audretsch, D.B. 1995. *Innovation and industry evolution.* Cambridge: MIT press

Audretsch, D.B, Carree, M. A. and Thurik, A.R. 2001. "Does enterprenuership reduce unemployment?" *Timbergen Institute discussion paper T101- 074/3.*

Audretsch, D.B; Thurik, R. 2002. "Linking Entrepreneurship to Growth." OECD STI Working Paper.

Baumol, W. 1990. "Entrepreneurship: productive, unproductive, and destructive." *Journal of Political Economy 98*:893–921.

Baumol, W. 1993. *Entrepreneurship, management, and the structure of payoffs*. Cambridge: MIT.

Baumol, W., Litan, R.,and Schramm C. 2007. *Good Capitalism Bad Capitalism and the Economics of Growth and Prosperity*. New Haven & London: Yale University .

Bjørnskov, C. and Foss, N. 2008. "Economic freedom and entrepreneurial activity: Some cross-country evidence." Public Choice 134: 307-328.

Blanchflower, D. and Oswald, A. 1998. "What makes an entrepreneur?" *Journal of labour economics* 16:26-60.

Blanchflower, D. G. 2000. "Self-employment in OECD countries." *Labour Economics 7*: 471–505.

Blomstorm and Kokko. 1997. "The impact of foreign investment on host countries: A review of the empirical evidence." World Bank policy research working paper no. 1745.

Boettke, P. J., and Coyne, C. J. 2003. "Entrepreneurship and Development." In *Advances in Austrian Economics: Austrian Economics and Entrepreneurial Studies*, vol 6, edited by R. Koppl, J. Birner, and P. Kurrild-Klitgaard, 67-87. Bingley, UK: Emerald Group Publishing Ltd.

——— .2000. Modeling business ownership in the Netherlands. *Scales research report H199911. EIM Business and Policy Research.*

Braunerhjelm, P. 2010. "Entrepreneurship, Innovation, and Economic Growth: Past experiences, current knowledge and policy implications*" (Working Paper).* Stockholm: Swedish Entrepreneurship Forum, Royal Institute of Technology.

Cantillon, R. 1755. In *Essai sur la nature de commerce en general*, edited by H. Higgs. London: Macmillan, 1931.

Carrie, M. & Thurik, R. 1999. "Industrial Structure and Economic Growth." In *Innovations, Industry Evolution, and Employment*, edited by D. Audretsch and R. Thurik. Cambridge: Cambridge University Press.

Carree, M.,Van Stel, A., Thurik, R., and Wennekers, S. 2002.. "Economic Development and Business Ownership: An Analysis Using Data of 23 OECD Countries in the Period 1976–1996." *Small Business Economics* .

Erken, H., Donselaar, P., Thurik, R. 2008. "Total factor productivity and the role of entrepreneurship." The JENA Economic Research Papers 2008-19, Friedrich Schiller University and the Max Planck Institute of Economics, Jena.

Evan D.S. and Leighton, L.S. 1990. "Small business formation by unemployed and employed workers." *Small Business Economics* 2:319-330.

Fisher, E. and Reuber, R. 2010. *The State of Entrepreneurship in Canada.* Industry Canada. Ottawa: Public Works and Government Services.

Fonseca, R., Lopez - Garcia, P. and Pissarides, C. A. 2001. "Entrepreneurship, startup and employment". *European Economic Review* 45:692-705.

Foti, A. and Vivarelli, M. 1994. "An econometric test of the self – employment model: The case of Italy." *Small Business Economics 6: 81- 94.*

Gartner, W.B. 1990. "What are we talking about when we talk about *entrepreneurship?" Journal of business venturing* 5:15-28.

Grossman G. M. and E. Helpman. 1991. *Innovation and Growth in the Global Economy*. Cambridge, MA: MIT Press.

Gujarati D.N. & Porter D. C. 2009. *Basic econometrics*. New York: McGraw – Hill.

Henrekson, M. 2005. "Entrepreneurship: a weak link in the welfare state?" *Industrial and Corporate Change* 14: 437–467.

Henriquez, C. Verheul, I, van der Knaap, I., and Bischoff, C. 2001. "Determinants of entrepreneurship in France: policies, institution and culture." Accessed 2008, September 11.www. Spea.indiana.edu/ids/pdfholder/ISSN-01-4.PDF

Holcombe, R. G. 2008. "Entrepreneurship and Economic Growth." In *Making Poor Nations Rich: Entrepreneurship and the Process of Economic Development*, edited by B. Powell, 54-78. Stanford, CA: Stanford University Press.

Ilmakunnas, P., Kanniainen, V. and LAMMI, U. 1999. "Entrepreneurship, economic risks and risk – insurance in the welfare state." *Discussion paper No. 453, University of Helsinki.*

Johnson, S. McMillan, J. and Woodruff, C. 2000. "Entrepreneurs and the ordering of institutional reform: Poland, Slovakia, Romania, Russia and Ukraine compared." *Economics of Transition* 8:1-36.

Johnson, S. McMillan, J. and Woodruff, C. 2002. "Property rights and finance." *American Economic Review* 9:1335-1356.

Jovanovic, B. 1982. "Selection and the evolution of industry." *Econometrica* 50: 649-670.

Karlsson, C., Friis, C., and Paulsson, T. 2005. Relating Entrepreneurship to Economic Growth. In *The Emerging Digital Economy: Entrepreneurship, Clusters and Policy*, edited by B. Johansson, C. Karlsson, & R. R. Slough,83-111. Berlin: Springer-Verlag.

Klapper, L., and Quesada Delgado, J. M. 2007. "View Point: Entrepreneurship - New Data on Business Creation and How to Promote It." *Note No. 316.* Washington DC: The World Bank Group.

Knight, F. 1921. *Risk, uncertainty, and profit*. Reprint 1965. New York: Houghton Mifflin.

Kirzner, I. M. 1973. *Competition and Entrepreneurship.* Chicago, IL: The University of Chicago Press.

Lee, S. Y., Florida, R., and ACS, Z. J. 2004. Creativity and Entrepreneurship: A Regional Analysis of New Firm Formation. *Regional Studies* 38 (8):879-891.

Lucas, R.E .1978. "On the size distribution of business firms." *Bell Journal of Economics* 9: 508-523.

Morck, R., Yeung, B. and Yu, W. 2000. "The information content of stock markets: Why do emerging markets have synchronous stock price movements?" *Journal of Financial Economics* 59:215-260.

Naude, W. A. 2008. Entrepreneurship in Economic Development. *UNU-WIDER Research Paper No. 2008/20.* Helsinki: United Nations University.

North, D. C. 1990. *Institutions, institutional change, and economic performance*. Cambridge: Cambridge University Press.

OECD (Organization for Economic Co-Operation and Development). 1996. Labor force statistics. Paris: OECD.

Reynolds, P.D., Hay, M., Bygrave, W.D. and Camp, S. M. 1999. *Global entrepreneurship monitor: 1999 executive report*. Missouri: Kauffman Centre for entrepreneurship leadership.

Romer, P. M. 1986. "Increasing Returns and Long Run Growth." *Journal of Political Economy* 94:1002–1037.

Romer, P. M. 1990. "Endogenous Technological Change." *Journal of Political Economy* 98, S71–S102.

Salgado-Banda, H. 2005. "Entrepreneurship and Economic Growth: An Empirical Analysis." *Research Paper*: 1-46. Mexico City: Banco de Mexico.

Schumpeter, J. A. 1911/1934. *The theory of economic development*. Cambridge: Harvard University Press.

Schumpeter, J. A. 1942. *Capitalism, socialism, and democracy*. London: Harper Perennial.

Solow, R. M. 1957. "Technical Change and the Aggregate Production Function." *The Review of Economics and Statistics* 39 (3):312-320.

Storey, D. J. 1999. "Six steps to heaven: Evaluating the impact of public policies to support small business in developed economies." In *Handbook of entrepreneurship,* edited by Sexton, D.L. and Landstorm, H. ,176-194. Oxford: Blackwell.

Tamvada, J. P. 2009. *Entrepreneurship and Welfare*. UNU-WIDER .

Van der Sluis, J., van praag, M. and Vijverberg, W. 2005. "Entrepreneurship selection and performance: A meta- analysis of the impact of education in developing economies." *World Bank Economic Review* 2:225-261.

Wennekers, S., & Thurik, R. 1999. "Linking Entrepreneurship and Economic Growth." *Small Business Economics* 13 (1): 27-55.

Wennekers, S., Uhlaner, L. M., and Thurik, R. 2002. "Entrepreneurship and Its Conditions: A Macro Perspective." *International Journal of Entrepreneurship Education* 1 (1): 25-68.

Appendix

Table 1: List Countries under Study

Free Countries above 80%	Mostly free less 80%-60%		Mostly un free less 60%
Hong Kong	Albania	Italy	Algeria
Ireland	Armenia	Jamaica	Argentina
New Zealand	Austria	Japan	Azerbaijan
Singapore	Belgium	Jordan	Belarus
Switzerland	Bulgaria	Latvia	Brazil
	Canada	Lithuania	Cambodia
	Chile	Malaysia	China
	Colombia	Malta	Croatia
	Costa Rica	Mexico	Egypt
	Cyprus	Oman	India
	Czech -Republic	Panama	Indonesia
	Denmark	Peru	Kazakhstan
	El Salvador	Poland	Moldova
	Finland	Portugal	Morocco
	France	Romania	Pakistan
	Georgia	Slovakia	Russia
	Germany	Slovenia	Sri Lanka
	Guatemala	Spain	Suriname
	Hungary	Sweden	Tunisia
	Iceland	Turkey	Ukraine
	Israel	United- kingdom	Uzbekistan

Table 2: Variables with Description and Source

Description of the Variables Used in The Regression Models			
Variables		**Description**	**Source/ Database**
Dependent			
EA	Entrepreneur activity	New businesses registered are the number of new limited liability corporations registered in the calendar year	World Bank
Macroeconomic Measures			
GDPC	GDP per capita (constant LCU)	GDP per capita is gross domestic product divided by midyear population. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. Data are in constant local currency	
UNEMPL	Total (percent of total labor force)	Unemployment refers to the share of the labour force that is without work but available for and seeking employment.	World development Indicator
TAXR	Total tax rate (% of commercial profits)	Total tax rate measures the amount of taxes and mandatory contributions payable by businesses after accounting for allowable deductions and exemptions as a share of commercial profits. Taxes withheld (such as personal income tax) or collected and remitted to tax authorities (such as value added taxes, sales taxes or goods and service taxes) are excluded.	
INFL	GDP deflator (annual %)	Inflation as measured by the *annual* growth rate of the *GDP* implicit *deflator* shows the rate of price change in the economy as a whole	
EFI	Overall economic freedom index.	Economic freedom is the fundamental right of every human to control his or her own labor and property. In an economically free society, individuals are free to work, produce, consume, and invest in any way they please, with that freedom both protected by the state and unconstrained by the state. In economically free societies, governments allow labor, capital and goods to move freely, and refrain from coercion or constraint of liberty beyond the extent necessary to protect and maintain liberty itself	Heritage Foundation

Table 3: Panel Unit Root Results

Free countries	Dependent variable ENTRD	Independent variables EFI	GDPC	INFLD	TAXR
Method LLC-t*					
level	-3.94***	-3.02**	-9.94***	-11.12***	-1.55*
first difference	-4.82***	-1.6*	1550.1	-8.57***	-
IPS-W- Stat					
level	-0.81	-0.83	-2.96**	-4.54***	
ADF- Fisher Chi- square					
level	10.65	10.83	23.53**	31.57**	3.45
first difference	10.2	17.4*	0.001	17.64*	
PP - Fisher Chi-square					
level	12.104	12.12	27.47**	47.9***	2.241
first difference	10.2	20.29*	0.001	17.64**	
Moderately FREE 42 Countries	Dependent variable	Independent variables			
	ENTRD	EFI	GDPC	INFLD	TAXR
Method LLC-t*					
level	-4.49***	-10.9***	-8.17***	-7.43***	-17.8***
first difference	-7.73***	-7.13***	4.43	11.868	53.162
IPS-W- Stat					
level	-1.313*	-1.71*	-0.03	-1.9*	-4.30***
ADF- Fisher Chi- square					
level	72.416	78.9	52.57	82.68	125.43**
first difference	48.88	43.83	105.42	150.67***	0.33
PP - Fisher Chi-square					
level	67.913	180.8***	79.81	102.5*	219.9***
first difference	48.88	39.89	50.722	99.902	0.044
	Dependent variable	Independent variables			
Mostly unfree- 20 countries	ENTRD	EFI	GDPC	INFLD	TAXR
Method -LLC-t*					
level	-3.196***	-9.96***	-2.32*	0.0225*	-16.0***
first difference	2.456**	-180.18***	-23.59***	-15.89***	
IPS-W- Stat					
level	0.324	-2.626**	1.57	0.53	
ADF- Fisher Chi- square					
level	31.46	54.68*	28.26	0.69	42.69*
first difference	29.277	79.606**	78.48**	55.15*	
PP - Fisher Chi-square					
level	37.5*	69.625**	51.82*	0.31	60.95***
first difference	33.3	87.875***	84.59**	59.97*	

Table 4: Macro Determinants of Entrepreneurial Activities

Explanatory Variables	Free Countries		Moderately Free Countries		Less Free Countries	
	1	2	1	2	1	2
EFI	0.525***	0.528***	0.178***	0.178***	-0.052*	-0.04996*
	(0.002359)	(0.0236)	(0.0000007)	(0.0000006)	(0.028)	(0.0279)
GDPC	35.04850***	0.0081***	0.00036***	0.00037***	0.00004***	0.000004**
	(0.148393)	(0.00056)	(0.0000005)	(0.0000006)	(0.00008)	(0.000006)
UNEMPL	-1.75483***		2.526***	2.526***	-0.257114	-0.022719
	(0.011578)		(0.00000002)	(0.00000012)	(0.393)	(-0.592)
R²	0.999	0.98			0.88	0.48
constant	-947.8793***	-77.780***			-3.823*	-3.519
	(4.1498)	(4.33)			(2.0204)	(2.06)
Estimation Method	Fixed OLS	Random-EGLS	Fixed OLS	Random-EGLS	Fixed OLS	Random-EGLS

Note: numbers in ( ) are standardized errors, (*), (**) and (***) indicate 10 %, 5% and 1% level of significant, respectively

Table 5: Descriptive Summary for Parameters

	EA	GDP	INFL	EFI	TAXR
Mean	1.040854	8.994194	1.338274	4.203772	3.813463
Median	1.169381	8.706393	1.3554	4.19419	3.867026
Maximum	3.449035	10.55166	3.22811	4.498698	4.41401
Minimum	-0.776529	6.867169	-0.855416	3.923952	3.11795
Std. Dev.	0.91063	1.095983	0.785812	0.104091	0.291922
Skewness	-0.064382	-0.08797	-0.141876	0.535693	-0.36515
Kurtosis	2.485089	1.714372	2.914708	3.640576	2.694258
Sum	148.8422	1286.17	191.3731	601.1393	545.3253
Sum Sq. Dev.	117.753	170.5675	87.68505	1.538559	12.10105
Observations	143	143	143	143	143

Table 6: Cross Sectional and Pool Data Results Macro Determinants of Entrepreneurial Activity Mostly Unfree Countries

	Free Countries		Mostly free Countries				
	1	2	3	4	5	6	7
EFI	0.17032*** (0.02474)	0.5693* (0.2036)	0.0258*** (0.00195)	0.3213* (0.1845)	0.010326 (0.0243)	0.03433* (0.0149)	0.133591* (0.074934)
GDPC	6.6558*** (0.203)	0.0268* (0.01501)	0.1148*** (0.00693)	0.001846* (0.00113)	0.006813 (0.049433)	-0.1927* (0.1039)	0.103701* (0.11305)
TAXR	0.10433*** (0.0045)	0.2186* (0.0588)	-0.589*** (0.02676)	-0.002934 (0.00257)	-0.13275* (0.02521)	-0.0009 (0.00073)	-0.10933* (0.06257)
INFLD	-0.10433*** (0.00451)	-0.21865* (0.00087)	1.3666*** (0.0625)	-0.005012 (0.005721)	0.007776 (0.02117)	-0.01268 (0.00908)	-0.02764 (0.01972)
R²	0.98	0.73	0.814	0.83	0.31	0.73	0.96
J-statistic							4.554496
Estimation Method	OLS panel data	GMM POOL countries (Bartlett kernel, Newey-West fixed)	OLS panel data	GMM POOL countries (Bartlett kernel, Newey-West fixed)	OLS panel data	GMM POOL countries (Bartlett kernel, Newey-West fixed)	Pooled Countries

Note: numbers in ( ) are standardized errors, (*), (**) and (***) indicate 10 %, 5% and 1% level of significant, respectively