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An Investigation into the Interaction Effect between Country Development and Various Growth Scenarios on the Rates of Specific Entrepreneurial Activities.

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Abstract

As entrepreneurs play an important role in industry innovation, employment, and overall economic growth, the study of entrepreneurs and what drives their entry has become a heavily researched topic in economics. Research into the relationship between country development and entrepreneurship show that given different levels of development the entrepreneurship rates vary across countries. Furthermore, there are several forms of entrepreneurial activity with different mechanisms and drivers that stimulate their entry. In this paper I look at the entry of two forms of entrepreneurial activity, namely self-employed with employees and self-employed without employees. Moreover, I investigate how the effect of economic prosperity and economic decline moderated by country development, influences the entry rates of the abovementioned forms of entrepreneurial activity. Accordingly, I attempt to answer the central research question: "How do differences in economic development of countries influence various growth scenarios in their effect on entrepreneurial entry?". This paper investigates 38 countries from various parts of the world over a period of 15 years. The results of the econometric analysis show that the effect of positive relative growth on the entry rate of self-employed males with employees is in fact negatively moderated by country development. Additionally, the effect of positive relative growth on the entry rate of self-employed females with employees is not moderated by country development. Finally, the effect of negative relative growth on the entry rate of self-employed males and females without employees is not moderated by country development.

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1. Introduction

Entrepreneurs play a large role in a country's economy, as important small businesses are frequently founded and run by them (Santarelli & Vivarelli, 2007). These businesses often form a large portion of a country's gross domestic product (GDP) and are the backbone of a country's employment (Neumark, Wall, & Zhang, 2011). In rare cases, entrepreneurs start companies that go on to become large successful firms and are a great source of innovation (Wong, Ho, & Autio, 2005; Van Praag & Versloot, 2007). Thus, due to its high economic relevance the study of entrepreneurs is a heavily researched topic within the economic and business community, and its insights are of great value for policy makers. In their study, Wong, Ho and Autio (2005) look at how entrepreneurship and technology lead to economic growth. They find that only high growth Total early-stage Entrepreneurial Activity (TEA), which represent young, fast-growing businesses called gazelle firms, account for the difference in economic growth between countries. Thus, it is a widely held belief within the field that not every type of entrepreneurship is desirable as some small businesses can be very inefficient (Santarelli & Vivarelli, 2007). Therefore, understanding what type of entrepreneurial entry a country experiences is relevant for policy makers in order to estimate how a country's growth will potentially be affected by it.

Furthermore, a popular topic within entrepreneurial research is how country development may influence aspects of entrepreneurship, it especially influencing entrepreneurial entry by varying the incentives to enter (Wennekers, van Stel, Thurik, & Reynolds, 2005). Vice Versa entrepreneurship often affects a country's economic development by stimulating economic growth and innovation (Neumark, Wall, & Zhang, 2011; Acs & Szerb, 2007; Van Praag & Versloot, 2007; Van Stel, Carree, & Thurik, 2004). With this paper I intend to investigate how people's incentives to become entrepreneurs differ in countries at various levels of development, by looking at how the rates of two types of entrepreneurial activity are affected by different growth scenarios. Accordingly, I attempt to answer the question, how do differences in economic development influence various growth scenarios in their effect on entrepreneurial entry? For this I base my research on two previous papers, Wennekers, Van Stel, Thurik and Reynolds (2005) and Roman, Congregado and Milan (2013), which I discuss in detail in the theoretical framework. Further, to answer the central question of this paper I employ fixed effects and random effects regressions to the data collected. My research will provide policy makers with more insight on the relationship between economic development and entrepreneurial entry and thus, they will be able to estimate how the entrepreneurial landscape changes in different growth circumstances given a country's developmental level.

To have a more comprehensive view of research already conducted in the field of entrepreneurship, I discuss various scientific papers on different factors influencing entrepreneurial entry. This is also to contrast the previous research with my paper in order to further illustrate the novelty of my topic. It

is noteworthy that entrepreneurship is a heavily studied topic, with a broad scope of research looking at stimulation and characteristics associated with entrepreneurial entry. Therefore, I only discuss a few interesting papers regarding the topic on a micro and macro level, as well as its effect on economic growth.

Micro-level drivers and Entrepreneurship

On the micro level there is a lot of research as to what individual characteristics drive people to become entrepreneurs. Rocha, Carneiro and Varum (2015), looks at different characteristics of people, businesses and how they affect entry or exit of a market. They find that the people with multiple prior jobs are expected to become entrepreneurs as they gained a wide variety skill from job shifting. Interestingly, Huber, Van Praag and Sloof (2012) look at the effect of early entrepreneurship education on the intent of business ownership. The overall business ownership intent decreased however the true results of the programme are yet to be observed when they grow up and are confronted with additional knowledge, skills, and an increased maturity. Furthermore, Ekpoh and Edet (2011) investigate the role of entrepreneurial education in tertiary education on career intentions of university students in Nigeria. The paper shows that entrepreneurial education has a significantly positive effect on career intentions of becoming an entrepreneur amongst the students. Furthermore, the authors suggest that the Nigerian university system should encourage more initiatives to expose students to more entrepreneurial education. Finally, Basu and Altinay (2002) look at culture as a driver for entrepreneurship. They observe a diversity in entrepreneurial activities such as entry, financing, and nature of business. This diversity can be explained by different traits associated within cultures, indicating that the interaction between culture and entrepreneurship is stronger in some cultures than others.

Policy drivers and Entrepreneurship

Furthermore, a plethora of research has been conducted on political/regulatory drivers of entrepreneurial entry. Stenholm, Acs and Wuebker (2013), investigate how institutional arrangements in a country can influence the rate and type entrepreneurial activity. The results show that the regulation environment is not important to the formation of high impact growth firms, more important being the ability for knowledge spill overs to take place and capital availability to start a business. A seminal paper in entrepreneurship, Hessels, Van Gelderen and Thurik (2008) looks at different drivers of entrepreneurial motivation. The paper finds that countries with a high incidence of opportunity entrepreneurs tend to have an increased prevalence of high-job growth and export-oriented entrepreneurship. Furthermore, the level of social security is negatively related to the prevalence of innovative, high job growth and export-oriented entrepreneurship. Moreover, Van Stel, Storey and

Thurik (2007) examine the effect of regulations on entrepreneurial entry across 39 countries. They observe that minimum capital required, labour market regulations and education affect entrepreneurial entry significantly. Nascent entrepreneurial entry, which is the entry of individuals who attempt to create new business ventures, is often slowed down with higher capital required and more labour regulations. Additionally, a high education level is a significant factor in opportunity entrepreneurial entry but not for necessity entrepreneurs. Further, Santarelli and Vivarelli (2006) investigate and critically assesses the formation, growth and survival of new firms. The authors discover that the entry of new firms are heterogenous, thus innovative founders, gamblers, job escapees and passive followers are found together, with them being barely distinguishable upon initial entry to the market. Thus, policy makers are encouraged to have a more selective criteria when supplying entrepreneurs with resources, in order ensure that the individuals with the more progressive motivations are supported.

Entrepreneurship and Growth

A major reason as to why entrepreneurship has become an important field of study is its role in stimulating economic growth. Audretsch and Thurik (2001) look at the link between entrepreneurial activity and a countries growth performance. They study multiple countries regarding their change in entrepreneurial activity and the subsequent change in a country's growth performance. The paper finds that an increase in a country's entrepreneurial activity resulted in greater growth performance and, a decrease in unemployment. Furthermore, in their paper Audrestch and Fritsch (2003) look at the role entrepreneurship has on economic growth in Germany in the 1980s to the 1990s. They find that entrepreneurship in Germany, much like the US, is slowly becoming a major engine of growth. Further, they argue that both countries are experiencing a convergence in entrepreneurship and growth and that some of the effects of new start-ups on economic growth are only observable in the long term. Thus, inferring that long-term observations should be conducted to see the full effects of these entrepreneurial entrants on growth. Moreover, Mueller (2007) looks at whether entrepreneurship is an important vehicle for knowledge flows that leads to economic growth. He finds that particularly an increase in innovative start-ups lead to higher economic growth compared to an increase in generalised entrepreneurial activity. In addition, Thurik (2009) discusses the change of role entrepreneurship has experienced regarding economic growth and society. He finds that based on the conclusion of previous literature, entrepreneurship is increasingly becoming an engine for economic growth and social development. Further, there is an increase of young individuals in Europe positively associating with entrepreneurial activities, which is leading to a rise in the rate of said activities.

Given the papers discussed, it is clear entrepreneurship research on a micro level attempts to explain why individuals with certain traits and backgrounds enter entrepreneurship. On the macro

level, research looks at how a country's conditions in terms of regulation and policy influences entry as well as what impact entrepreneurship has on economic growth. However, none of the papers look at how the impact of growth on entry is influenced by a country's development. Therefore, in this paper I look at how different country development levels influence the effect of economic growth or decline on the rates of specific forms of entrepreneurial entry.

The remainder of this paper is comprised of a theoretical framework, where I discuss previous research conducted in entrepreneurship with respect to country development and literature that describe the main mechanism I investigate. Following these discussions, I present the research question and hypothesis' that ensue from the arguments offered by the papers. Further, I present and summarize the data, and discuss some insightful descriptive statistics regarding the research aim of this paper. This is followed by an introduction to the methodology used to test the hypothesis and a subsequent presenting of the results from the econometric analysis. Subsequently, I answer the central research question and discuss the results in the context of the theoretical framework. Finally, ending with a discussion on the limitations of this paper, further research opportunities and implications for policy makers.

2. Theoretical Framework

Firstly, I define entrepreneurship for this paper. In their research Block and Wagner (2006) define and investigate specific forms of entrepreneurship which mainly differ in terms of motivation to enter and business size. Firstly, they define and investigate opportunity entrepreneurs who are self-employed individuals who start a business to pursuit new opportunities and have higher earnings compared to waged work. Individuals who enter self-employment through this mechanism tend to expand their business and employ others to be more profitable and consequently increase their earnings. Secondly the paper investigates necessity entrepreneurs, which are individuals who enter self-employment due to the lack of employment options or the dissatisfaction of their current employment. Individuals who become self-employed through this mechanism tend to keep their businesses small as it is only a means of survival, and thus they are less likely to have ambitions to expand and employ others. Having discussed these concepts of entrepreneurship the definitions presented by Block and Wagner (2006) are best suited for this paper, as the main dependent variable's characteristics are in line with the characteristics of opportunity and necessity entrepreneurs, particularly regarding the employment of others.

Economic Development and Entrepreneurship

In this section I discuss more specific research conducted in entrepreneurship and economic development. This is to provide some background information for my theoretical framework and subsequent introduction of my hypothesis'.

A comprehensive paper on the topic, Naude (2013) looks at entrepreneurship and its role on economic development. He shows that entrepreneurship is both positive and negative for a country and this is determined by the dynamics of the country's development. In addition, Van Stel, Carree and Thurik (2004) investigate how the total entrepreneurial activity influences GDP growth in 36 countries. They find that total entrepreneurial activity does affect growth, but the impact varies upon per capita income, suggesting entrepreneurship activity and impact vary in different stages of development. Moreover, Toma, Grigore and Marinescu (2013) provide a theoretical model to highlight the main factors in the relationship between entrepreneurship and economic development. They argue that entrepreneurial tradition and education are engines for entrepreneurial potential. However, for this entrepreneurship to make an impact, a country's institutions, governmental policies, and legal framework need to be aligned with the entrepreneurial intentions. Furthermore, Acs and Szerb (2007) discuss various factors important to the link between entrepreneurship and economic growth, based on this they recommend that specific public policy can increase the impact of entrepreneurship on economic growth. Middle income countries are recommended to increase human capital, upgrade technology, and make it more available as well as promote enterprising activity. Additionally, developed countries are recommended to reduce entry regulations. Di Addario and Vuri (2010) analysed the effect population density of an area where graduated students live on their career prospects of becoming an entrepreneur. They discover that increased urbanisation decreased the chances of the students becoming entrepreneurs. Amongst the influencing factors, the authors present high labour cost and competition that decrease entrepreneurial entry. Furthermore, Van Praag and Versloot (2007) look at what the contributions of entrepreneurs are to the overall economy compared to non-entrepreneurs. The paper is based on a review of 57 recent studies and they find that entrepreneurs give rise to more employment, productivity, growth and produce commercialized high-quality innovation. Furthermore, Sternberg and Wenneker (2005) look at the determinant effect of entrepreneurial entry across multiple countries. They find that entrepreneurs have a positive effect on growth for developed countries but a negative effect on growth for less developed countries, further opportunity entrepreneurs play a big role in knowledge spill overs. Interestingly they argue that entrepreneurship must be observed within a regional framework, by taking regional policies into consideration to understand its activity and entry.

From the above-mentioned papers it is clear that in a broad sense there are multiple avenues at which entrepreneurship and country development are related. However, there has also been very specific research conducted on the relationship between a country's development level and the rate of entrepreneurship. In the following two subsections I discuss some interesting insights on the topic as they provide an important foundation for the formulation of the hypothesis' in this paper.

What are the rates of entrepreneurship at different levels of development?

There are multiple theories as to how the rate of entrepreneurship could vary given a countries development and innovation phase. Sledzik (2013) discusses various views presented by Joseph Schumpeter on how entrepreneurship and innovation relate. Further Sledzik explains Schumpeter's proposition, specifically that industries largely begin with many start-ups that lead industry innovation which is termed a Schumpeter phase 1 industry, however eventually a few large firms dominate the industry and lead the innovation making the industry a Schumpeter phase 2 industry. This has been the basis to argue that many highly developed countries do not see many entrepreneurial entrants, as most of their industries are dominated by large firms who lead in innovation and market share. However, researchers have found empirical evidence to refute this claim. David (1987) first investigates the changes in the US entrepreneurial rate over a period of nearly 20 years. He finds that at first the entrepreneurial rates in the US are low however later the rate begins to rise, with economic development being a significant positive factor in this change. This research taking the first step towards the argument that indeed there is an increase in the entrepreneurial rate with a rise in development for developed countries. In their paper, Acs, Audretsch and Evans (1994) investigate the relationship between economic development and entrepreneurial entry rates, where they observe the rates of lesser developed and industrially higher developed countries. They find that in the 1970s and 1980s 15 out of the 23 developed countries that were studied had a positive rate of entrepreneurship. This being in line with the idea that the relationship between entrepreneurship and country development is U shaped with highly developed countries seeing an increase in entrepreneurship due to increased earning opportunities for individuals.

Furthermore, Acs, Desai and Hessels (2008) conduct a large investigation with respect to the relationship between entrepreneurship rates and economic development. An interesting finding in their paper is that countries with higher rates of opportunity motivated entrepreneurship were additionally countries with higher levels of income. Further, overall levels of self-employment are higher in highly developed countries than developing countries. Interestingly, the paper discusses a research program conducted by the Global Entrepreneurship Monitor (GEM) which finds that less developed countries have high levels of entrepreneurship, with the rate decreasing when looking at countries with increased development, and the entry rate eventually rising again once looking at highly

developed countries. Once Again, arguing towards a possibly U shape curve between entrepreneurship rates and economic development.

How does a country's economic development affect the rate of entrepreneurship?

In their paper, Wennekers, Van Stel, Thurik and Reynolds (2005) discuss how at different levels of economic development we are likely to find different levels of entrepreneurship. The first level of economic development in a country is an agriculture-based economy, where the economy is focused on the mobilisation of primary factors such as land, primary commodities, and unskilled labour. At this level the rate of entrepreneurship is expected to be high as the propensity to become a necessity entrepreneur increases, as social services in these countries are virtually non-existent, thus people are forced to set up a business in order to survive and a high business ownership is expected.

Next is the mid-level, where economies are highly industrialised. The economy is capital intensive, and workers are trained to operate sophisticated technology. A major feature of this economy is that economies of scale are important for competition thus, firms that scale up and become larger are most prevalent and dominant in the markets. Rates of ownership are expected to steadily be decreasing and eventually plateau. This is due to workers seeking waged work as it provides safer work and higher wages, additionally small businesses are likely to be driven out of the market because they fail to achieve a high economy of scale. Thus, a low level of business ownership is expected. Finally, the last level is a technology generating economy. Its focus is on generating, commercialisation of knowledge and it is seen as a knowledge-based economy. The rate of business formation is likely to be high due to increased profit opportunity. The profits people can realise are higher than the wages they would earn from employment. Additionally, there is a need for self-actualisation and owning a business reflects a form self-actualisation.

Push and Pull theory in Entrepreneurial Entry

In the field of research looking at drivers for entrepreneurial entry they find two broad types of drivers termed push factors and pull factors (Gilad & Levine, 1986). These have been present in the discussion of the previous subsection however not within this specific framework. In this section I explain what these factors are and discuss previous research conducted on the prevalence of the factors in entrepreneurial entry, as they play an important role in the formulation of the hypothesis for this paper.

A pull factor is when individuals are pulled into self-employment due to an improvement in their career or earnings (Gilad & Levine, 1986; Drinkwater & Clark, 2000). There are multiple factors, however a higher earning seems to be the most common pull factor (Zgheib, 2018). In his paper Taylor (1996) investigates various motivations for why people become entrepreneurs and finds that higher

earnings play a significant and strong positive role in choosing to become self-employed. Furthermore, in a study conducted on the entrepreneurial landscape of England, Drinkwater and Clark (2000) confirm the idea of a pull effect from higher earnings on individual choices to become entrepreneurs. In addition, Kirkwood (2009) finds that men and woman have similar pull factors that motivate entry into entrepreneurship. However, women more motivated by independence as a pull factor compared to men.

A push effect is when people move into self-employment due the lack of employment opportunities or unsatisfactory options of employment (Gilad & Levine, 1986; Zgheib, 2018). In their paper, Gilad and Levine (1986) point to the prevalence of push factors in entrepreneurial entry and refer to various psychological studies which show that some entrepreneurs are motivated to establish their business due to their decreased job satisfaction. Interestingly, an additional factor is that many individuals who feel alienated towards society or seen themselves as "misfits" are also motivated to start their own businesses to prove their self-worth. Moreover, Zgheib (2018) investigates the prevalence of push factors in entrepreneurial entry between women in the United States and Lebanon. He finds that push factors are more prevalent amongst Lebanese women compared to US women. Further, he finds that pull factors are more prevalent as a driver in overall entrepreneurial entry compared to push factors. In addition, Kirkwood (2000) finds that men are more motivated by job dissatisfaction as a push factor compared to women.

How does economic growth or decline affect entrepreneurial entry regarding push-pull theory?

In their paper, Roman, Congregado and Milan (2013) look at different regulations, start-up incentives and their influence on entrepreneurial entry. Amongst their hypothesis' were two theories I drew inspiration from for this paper.

Firstly, the prosperity pull effect, where people choose to engage in entrepreneurship in economically prosperous times because people are more likely to succeed and earn higher profits compared to waged work income in a positive growth period, this is often termed opportunity entrepreneurship. It is likely that the people who enter entrepreneurship for high profits and to earn more than a regular employed position tend to expand their business and employ other people. Thus, for this effect I observe the changes in the percentage of self-employed with employees.

Secondly, the recession push effect, where people are forced into entrepreneurship due to the lack of waged work in times of economic decline. This is because they still need to provide for their families and have no effective social system in place to help provide, thus individuals enter this form of necessity entrepreneurship to survive. When pushed into entrepreneurship through this mechanism, it is likely that these entrepreneurs do not hire other people as they only engage in

entrepreneurship to provide for their families in hard economic times and have little ambition to expand. Thus, for this effect I observe the change in percentage of self-employed without employees.

Main Research Question and Hypothesis

Given the various papers discussed in this section, the main research question arises "How do differences in economic development of countries influence various growth scenarios in their effect on entrepreneurial entry?"

I argue that the prosperity pull effect is expected to be stronger in higher developed countries as opposed to lesser developed countries, as people will be more inclined to start a business to earn high profits. This is because the possibility of earning high profits for entrepreneurs in a higher developed country is larger compared to a lesser developed country due to differences in overall wealth.

Furthermore, the recession push effect is expected to be stronger in lesser developed countries as opposed to highly developed countries. This is because in a recession many people in lesser developed countries lose their jobs and do not have an effective social system to help provide for themselves and their families compared to their highly developed counterparts. This leads to my hypothesis':

H1: The positive effect of positive relative growth on the percentage of self-employed with employees is positively moderated by a country's development.

H2: The positive effect of negative relative growth on the percentage of self-employed without employees is negatively moderated by a country's development.

3. Data and Descriptive Statistics

3.1 Data Source

In this paper I obtain the data from multiple sources. The main dependent variables which measure the entrepreneurial entry and the tertiary education control variable used are obtained from the Organisation of Economic Cooperation and Development (OECD, 2020). Further, multiple control variables are obtained from the World Bank such as GDP, minimum capital required to start a business and the number of days to register a business (World Bank, 2019). Additionally, a developmental index is obtained from the United Nations database (United Nations, 2019).

3.2 Defining Variables

The econometric analysis conducted has four separate regressions, with each having a different dependent variable and multiple control variables to test the hypothesis, here I define the variables.

To measure and distinguish what type of entrepreneurs enter and subsequently what mechanism has likely stimulated the entry into the market, I use the OECD self-employed with employee's and self-employed without employee's statistics. The OECD defines self-employed with employees as "people whose primary activity is self-employment and who employ others" (OECD, 2020). This variable is used to answer the main research question with respect to the prosperity pull effect. Further, I choose this variable as people who engage in entrepreneurship to increase their wage are likely to expand their business to increase profits and therefore hire employees (Roman, Congregado, & Millan, 2013; Poschke, 2013). This also being in line with the afore defined concept of opportunity entrepreneurs (Block & Wagner, 2010). Additionally, the OECD defines self-employed without employees as "people whose primary activity is self-employment and do not employ others" (OECD, 2020). This variable is used to answer the main research question with respect to the recession push effect. Further, I use this variable as people who are forced into entrepreneurship due to the lack of a better alterative are unlikely to employee others as they solely want to provide for themselves and their families (Roman, Congregado, & Millan, 2013; Poschke, 2013). This being in line with the previously defined concept of necessity entrepreneurs (Block & Wagner, 2010). Both Variables are measured as percentages of total employed population by sex.

The main indicator for development I use is the Human Development Index (HDI) from the United Nations. This is a composite index that accounts for life expectancy, per capita income, and education to rank countries in four tiers of development (United Nations, 2019). The variable is an index, with 0 being the minimum value representing no development and 1 the maximum value representing full development. It is of note that no country has a value of 0 or 1 in this sample.

Furthermore, to assess the economic growth of a country I use GDP. Obtained from the world bank databank, this is defined as "the 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". It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources (World Bank, 2018). The variable is measured in US dollars.

Moreover, I use a tertiary education control variable. The variable is represented by the OECD statistic population with tertiary education, which is defined as "the highest level of education completed by the 25-64-year-old population" (OECD 2020). The indicator is measured as a percentage of the same age population and is meant to capture the differences in percentages of population with tertiary education of the various countries which may influence the entrepreneurial entry rate, as suggested by Ekpoh and Edot (2011). While the HDI variable included in the model does control for education, where the gross enrolment rate of each level of education is incorporated into the index, it does not incorporate the number of actual graduates. The difference between being a graduate or

being enrolled as a university student may influence the amount of entrepreneurial activity as a graduate may have more time, knowledge and a larger network to start a business compared to a currently enrolled student. Therefore, I specifically control for the number of university graduates per country as well.

Furthermore, I use population density as a control variable. The data is obtained from the World Bank and is calculated by the midyear population divided the land area in square kilometres. Population is defined as "the residents and citizens of a country regardless of legal status except for refugees not permanently settled in the country of asylum" and "the land area is the total countries land excluding area under inland water bodies, national claims to continental shelf, and exclusive economic zones" (World Bank, 2018). It is measured in people per square mile and is added to control for the differences in population density of the countries, which may have a negative effect on entrepreneurial entry due to higher labour costs and increased competition as suggested by Di Addario and Vuri (2010). An additional regulatory control variable I include, minimum capital required to start a business, is meant to capture the differences in minimum capital required to start a business set by each country, as this may be a potential barrier to entry that negatively effects entrepreneurial entry rates as mentioned by Van Stel, Storey and Thurik (2007). Measured by the World Bank it is defined as "the amount that the entrepreneur needs to deposit in a bank or with a notary before registration and up to 3 months following in-corporation which is then recorded as a percentage of the country's income per capita". Where the variable is measured in terms of percentage of per capita income of the country (World Bank, 2019). I further control for the number of days to register a business as many countries have different durations to register a business, where the longer time taken to start a business could possibly decrease the amount of entrepreneurial entry. The variable is represented by the World Bank measure "time required to start a business", measured in days (World Bank, 2018).

All these variables are comprised in a master databank to create additional variables for further econometric analysis.

Firstly, as the sample of my paper involves countries from different parts of the world, they have different cultural aspects that could influence the rate of entrepreneurial entry (Basu & Altinay, 2002; Sternberg & Wennekers, 2005). Thus, to control for these country specific effects I create a categorical dummy variable for each country and add them to the models that use the random effects regression technique. I do not include these dummy variables for the model using a fixed effects regression as these differences between countries are automatically absorbed by the constant of the regression.

In order to assess the different relative growth scenarios, positive and negative, and how they affect entrepreneurial entry I generate a variable named relative growth. This is created by taking the current GDP level, subtracting the previous year's GDP level from it and dividing that product by the previous year's GDP level. This is to assess whether a country experienced relative economic growth or decline in a specific year. Further, this variable is then used to create to additional and more specific growth variables named positive and negative growth. When the relative growth is positive, which is a sign of economic growth, I copy this value into the column "positive relative growth" and when negative the value is replaced by a missing value. Similarly, for economic decline, when the relative growth is negative, which indicates economic decline, I copy the value into the column "negative relative growth" and when the value is positive it is replaced with a missing value.

Furthermore, to assess if economic development plays a moderating role in how various growth scenarios affect the entry of different types of entrepreneurship, I generate an interaction term for both positive and negative growth. The interaction term for positive growth is created by taking positive relative growth and multiplying it with the HDI variable for each corresponding year. In the same manner the interaction term for the negative growth is created by taking negative relative growth variable and multiplying it with the HDI variables for each corresponding year.

3.3 Sample Selection

In order to obtain a large enough sample size, the time range of the data is from 1990 to 2019. The exceptions being for the variables days to register which ranges from 2003 to 2018 and minimum capital required to start a business which ranges from 2004 to 2019. This is due to the variables not being measured before and after the respective time ranges. Further, as the regression models include all control variables the time ranges for the regressions are from 2004 to 2018.

As my research is mainly focused on the factors that influence the propensity of specific types of entrepreneurial entry, my sample size is limited to the countries who offer the data that distinguishes between the two entrepreneurial entries defined in my research. The sample of countries chosen was based on the countries present in the OECD database of the self-employed with employee's and self-employed without employee's statistics. The total number of countries present is 38, with at least one country from every region of the world represented, however European countries clearly being the highest in number (Table 2). The countries who are part of the organisation is determined by the OECD as they select member states through a rigorous review process.

Furthermore, all the variables of the original data set have null values for some years due to non-measurement. Thus, to account for measurement errors and distortions within the econometric analysis I replace any null values with a missing value once confirmed that they indeed represented a year of no measurement.

Finally, the independent variables from the original master databank that are not measured as percentages, which include HDI, Days to register, population density and GDP, are log transformed for the purpose of making their effect a relative change which allows to see their marginal effect on the dependent variables.

3.4 Descriptive Statistics

In Table 1, a summary of the main variables of the data used in the econometric analysis of the paper is presented. The first four variables represent the dependent variables used for the analysis. From this table it is clear there are higher population percentages of self-employed males with and without employees compared to their female counterparts. Moreover, it is of note that the number of observations for negative relative growth is much smaller than that of positive relative growth, thus indicating that the population sample in this paper has experienced overall more prosperous times. Furthmore, Table 2 shows a frequency table of all the countries in the sample of this paper.

Table 1

Summary satatistics of data used for the econometric anaylsis

Variables	Observations	Mean	Std. Dev.	Minimum	Maximum
Self Employed Males with Employees	859	6.2244	2.1430	1.1810	15.380
Self Employed Males without Employees	867	12.0634	5.6310	2.1600	33.5700
Self Employed Females with Employees	832	2.5259	1.2379	0.3860	8.2650
Self Employed Females without Employees	862	7.7554	4.3763	1.8400	22.2300
Log of HDI	1023	-0.1692	0.0727	-0.3567	-0.0513
Log of GDP	1015	26.3350	1.6997	22.1113	30.6536
Log of Population Density	1003	4.2132	1.3632	0.7975	6.2722
Log of Days to Register a Business	545	2.4418	0.9474	-0.6931	4.9273
Minimum Capital Required to Start Business	323	30.0780	39.2002	4.3000	308.8000
Population with Tertiary Education	768	28.2177	10.7260	6.0600	57.8900
Relative Growth	980	0.0527	0.1093	-1.0000	0.4414
Positive Relative Growth	721	0.0999	0.0730	0.0001	0.4414
Positive Relative Growth plus HDI	721	0.0841	0.0602	0.0001	0.3610
Negative Relative Growth	259	-0.0789	0.0826	-1.0000	-0.0004
Negative Relative Growth plus HDI	259	-0.0675	0.0725	-0.9140	-0.0004

Table 2

Frequency table of countries studied

Countries	Frequency	Percentage	Cumulative
Australia	29	2.83	2.83
Austria	29	2.83	5.67
Belgium	29	2.83	8.50
Brazil	13	1.27	9.78
Canada	29	2.83	12.61
Chile	29	2.83	15.44
Czech Republic	29	2.83	18.28
Denmark	29	2.83	21.11

Estonia	29	2.83	23.95
Finland	29	2.83	26.78
France	29	2.83	29.62
Germany	29	2.83	32.45
Greece	29	2.83	35.29
Hungary	29	2.83	38.12
Iceland	29	2.83	40.96
Ireland	29	2.83	43.79
Israel	29	2.83	46.63
Italy	29	2.83	49.46
Japan	21	2.05	52.30
Latvia	28	2.74	54.35
Lithuania	29	2.83	57.09
Luxembourg	19	1.86	59.92
Mexico	29	2.83	61.78
Netherlands	29	2.83	64.61
New Zealand	29	2.83	67.45
Norway	29	2.83	70.28
Poland	29	2.83	73.12
Portugal	29	2.83	75.95
Slovak Republic	29	2.83	78.79
Slovenia	29	2.83	81.62
South Africa	3	0.29	81.92
South Korea	29	2.83	84.75
Spain	29	2.83	87.59
Sweden	29	2.83	90.42
Switzerland	29	2.83	93.26
Turkey	13	1.27	94.53
United Kingdom	29	2.83	97.36
United States	27	2.64	100.00

In order to have an idea of how the self employed dependent varibales relate to postive and negative relative growth given differences in country development, I create four scatterplots with the dependent variables on the Y-axis and the various growth scenarios on the X-axis. The dependent variable has been fitted with two trend lines, the blue line representing lesser developed countries with an HDI of less than 0.75. Further, the red trend line representing higher developed countries with an HDI of more than 0.75. The structure is applicable for all scatterplots presented in this section.

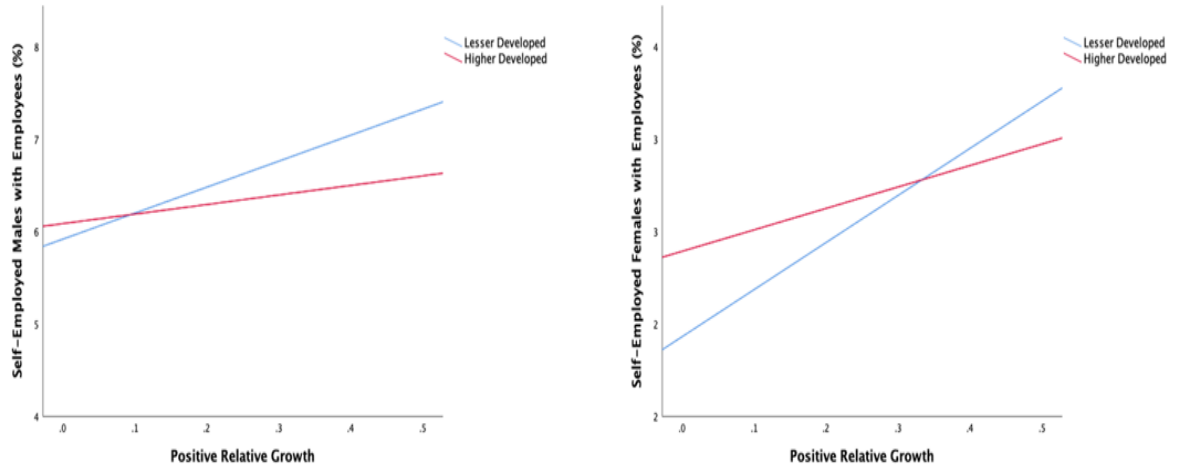

Figure 1. Scatterplot of population percentage of self-employed males and females with employee's by positive relative growth

The graph to the left shows the male population percentage of self-employed with employees by relative positive growth. Interestingly, the scatterplot shows that there is an increase of self-employed males with employees for lesser developed countries when experiencing positive growth. Furthermore, there is also an increase in the percentage of self-employed males with employees with positive growth for highly developed countries, however the increase for higher developed countries is at a smaller rate compared to their lesser developed counterparts.

The graph to the right illustrates the female population parentage of the sample who are self-employed with employees and shows much the same trend to their male counterparts. For lesser developed countries, the population percentage increases with an increase in positive growth. Moreover, in highly developed countries the population percentage increases as well with positive economic growth but at a smaller rate. This would suggest regarding both self-employed males and females with employees, that country development levels influence the effect positive relative growth has on this form of entrepreneurial entry.

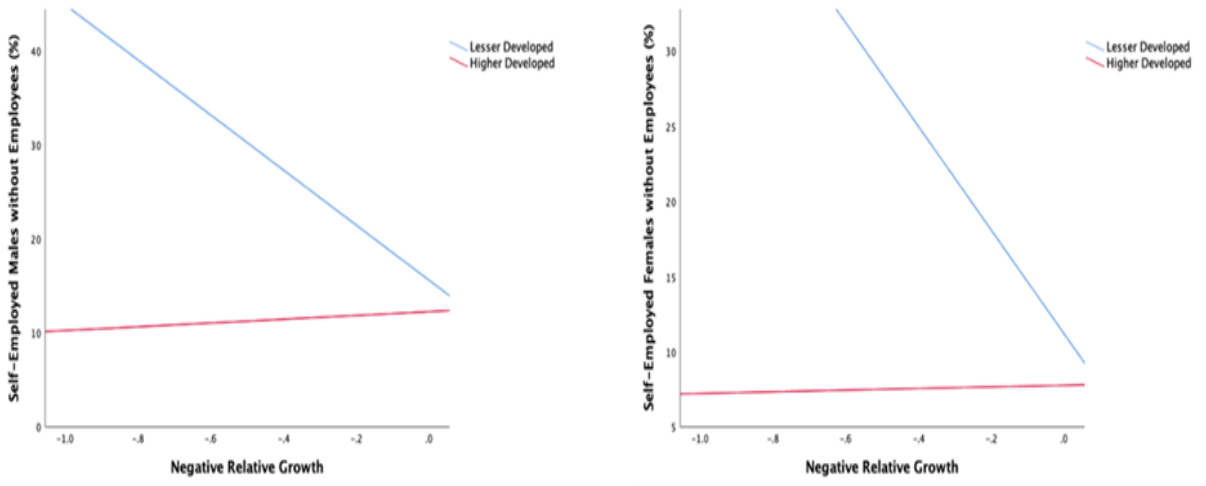

Figure 2. Scatterplot of the population percentage of self-employed males and females without employees by negative relative growth

The graph to the left shows the population percentage of the male self-employed without employees by negative growth. There is an increase in male self-employed without employees with worsening economic times for lesser developed countries. By contrast in higher developed countries the population percentage decreases as relative negative growth becomes larger. The graph to the right illustrates that the female population percentage of self-employed without employees by negative growth. This scatterplot shows the same trends as its male counterpart, with a negative relationship for self-employed females without employees in lesser developed countries and a positive relationship for self-employed females without employees in higher developed countries with regard to negative economic growth. Again, suggesting that given a country's development the effect of negative relative growth will be different on this form of entrepreneurial entry.

While the descriptive statistics convey interesting insights and give an idea of how the variables affect each other it would be fallacious to draw any conclusions from them. Therefore, the upcoming econometric analysis is conducted to provide a more suitable basis to draw concrete conclusions from, reject or confirm the hypothesis and answer the central research question.

4. Methodology

In order to answer the main research question of this thesis and test the hypothesis' presented, I run a fixed effects regression for self-employed males with employees and random effects regression for the remaining dependent variables. I choose these methods due to the nature of the research data, namely being panel data, having multiple independent variables and all the variables being continuous. Woolridge (2010) further argues that fixed and random effects regressions are best suited for panel data that has been selected from the same sample of countries within the same time period, which is the case for the data in this paper. To further confirm the regression techniques of choice, I conduct a

Breusch-Pagan Lagrange multiplier test, which indicates that a random effects regression is suitable for all dependent variables (Appendix 1). Further, I conduct a Hausman test on the main models that test the hypothesis, to assess whether a random effects or fixed regression model is most suited. The results indicate that a fixed effects regression is best suited for self-employed males with employees and random effects for the remaining dependent variables (Appendix 2). In this paper a major factor to consider are cultural differences amongst countries. This is due to the fact that the data is comprised of multiple countries from various parts of the world who are culturally quite different which may influence entrepreneurial entry (Basu & Altinay, 2002). Thus, the random effect models in subsections 5.3, 5.4 and 5.5 include country specific dummy variables to control for cultural differences. However, the model in subsection 5.2 does not include country specific dummy variables as the regression technique automatically accounts for them in the constant.

Furthermore, these analysis techniques have important assumptions that need to be fulfilled to make sound conclusions from the models. Firstly, the residuals need to be normally distributed, thus before discussing any regression analysis, the residuals from the databank were analysed for its distribution with a Jarque-Bera test. According to the test the residuals are normally distributed (Appendix 3). Secondly, to ensure heteroskedasticity I solely run robust regressions. Thirdly, to test for multicollinearity, I run OLS regressions with the same variables as the random and fixed effects regressions with country specific dummy variables and subsequently run a VIF test on the results. According to the VIF test, multicollinearity was not present for the variables of interest used to test the hypothesis for all main regression models (appendix 5). Thus, all main models presented in this paper fulfil important statistical assumptions for sound econometric analysis using these regression techniques.

Having discussed the regression technique used and its underlying assumptions I present and explain the regression formulae for the final models with which I test the hypothesis'.

For the first hypothesis the regression equations for the final model are the following:

$$Self\ Employed\ Males\ with\ Employees_{i,t} = \alpha + \beta_1 PositiveRelativeGrowthplusHDI_{i,t} + \beta_2 LogGDP_{i,t} + \beta_3 Population\ Percentage\ with\ Tertiary\ Education_{i,t} + \beta_4 LogHDI_{i,t} + \beta_5 MinimumCaptialRequired_{i,t} + \beta_6 LogDaystoRegister_{i,t} + \beta_7 LogPopulationDensity_{i,t} + u_{i,t}$$

$Self\ Employed\ Males\ with\ Employees_{i,t}$ represents the first dependent variable testing hypothesis one, it is the population percentage of self-employed males with employees across time *t* and country *i*. α represents the constant of the model. Further, $PositiveRelativeGrowthplusHDI_{i,t}$ represents the interaction term between positive marginal change of GDP at time *t* by country *i* and development at time *t* and country *i*. Moreover, $LogGDP_{i,t}$ represents the marginal effect of the change in GDP at time

t, by country *i*. Furthermore, $Population\ Percentage\ with\ Tertiary\ Education_{i,t}$ indicates the effect of a change in the population percentage of adults with tertiary education across time *t* by country *i*. Further, $LogHDI_{i,t}$ represents the effect of a marginal change in a country's development on the dependent variable at time *t* by country *i*. $MinimumCaptialRequired_{i,t}$ indicates the effect of a percentage change in minimum capital required to start a business at time *t* by country *i*. In addition, $LogDaystoRegister_{i,t}$ represents the marginal effect of a change in number of days to register a business across time *t* by country *i*. Further, $LogPopulationDensity_{i,t}$ represents the marginal effect of a change in population density of a country at time *t* by country *i*. Lastly, $u_{i,t}$ represents the error term.

$$Self\ Employed\ Females\ with\ Employees_{i,t} = \alpha + \beta_1 PositiveRelativeGrowthplusHDI_{i,t} + \beta_2 LogGDP_{i,t} + \beta_3 Population\ Percentage\ with\ Tertiary\ Education_{i,t} + \beta_4 LogHDI_{i,t} + \beta_5 LogMinimumCaptialRequired_{i,t} + \beta_6 LogDaystoRegister_{i,t} + \beta_7 LogPopulationDensity_{i,t} + \beta Country\ Specific\ Effects_i + u_{i,t}$$

Furthermore, this equation tests the first hypothesis with respect to the female population. Thus, the dependent variable is changed to $Self\ Employed\ Females\ with\ Employees_{i,t}$ which represents the population percentage of self-employed females with employees at time *t* by country *i*. Further, the control variables are the same as the previously discussed equation with the addition of $Country\ Specific\ Effects_i$ which are country dummy variables that control for country specific effects by country *i*.

For the second hypothesis the regression equations for the final model are the following:

$$Self\ Employed\ Males\ without\ Employees_{i,t} = \alpha + \beta_1 NegativeRelativeGrowthplusHDI_{i,t} + \beta_2 LogGDP_{i,t} + \beta_3 Population\ Percentage\ with\ Tertiary\ Education_{i,t} + \beta_4 LogHDI_{i,t} + \beta_5 LogMinimumCaptialRequired_{i,t} + \beta_6 LogDaystoRegister_{i,t} + \beta_7 LogPopulationDensity_{i,t} + \beta Country\ Specific\ Effects_i + u_{i,t}$$

To test the second hypothesis the dependent variables is changed to $Self\ Employed\ Males\ without\ Employees_{i,t}$ which indicates the population percentage of self-employed males without employees at time *t* by country *i*. With respect to control variables the equation above remains the same as the previously discussed equation. However, the main variable of interest used to test hypothesis 2 is changed to $NegativeRelativeGrowthplusHDI_{i,t}$. This represents the interaction term between a marginal decrease in GDP at time *t* by country *i* and development at time *t* by country *i*.

$$Self\ Employed\ Females\ without\ Employees_{i,t} = \alpha + \beta_1 NegativeRelativeGrowthplusHDI_{i,t} + \beta_2 LogGDP_{i,t} + \beta_3 Population\ Percentage\ with\ Tertiary\ Education_{i,t} + \beta_4 LogHDI_{i,t} +$$

$\beta_5 LogMinimumCaptialRequired_{i,t} + \beta_6 LogDaystoRegister_{i,t} + \beta_7 LogPopulationDensity_{i,t} + \beta Country\ Specific\ Effects_i + u_{i,t}$

The second regression equation to test the second hypothesis regarding the female population is the same as the previously mentioned equation, however the dependent variable is changed to $Self\ Employed\ Females\ without\ Employees_{i,t}$ which represents the population percentage of self-employed females without employees at time *t* across country *i*.

It is of note that the main purpose of the control variable is to further isolate the causal effect of the main independent variables of interest and prevent any biases. Nevertheless, their coefficients from the regressions are interpreted as they may present some interesting findings with respect to additional factors influencing entrepreneurial entry. However, a few control variables suffer from high collinearity, thus in the discussion section I mention which variables are affected, and consequently do not draw any conclusions from them in this paper. Moreover, the coefficients of the country dummies, representing the country specific effects are not included in the tables in the results section. This is because their coefficients are not interpreted due their high collinearity and as they solely serve to control for country specific effects. However, their coefficients are available in Appendix 4 with the full regression results. It is of note that the order of the countries present in the full regression results in Appendix 4 corresponds with the order of countries in Table 2.

Finally, time fixed effects are not included as control variables, as they render the variables of interest statistically unfeasible to draw conclusions from with their collinearity values becoming too large. This is discussed in more detail in the research limitations.

5. Results

5.1 Overview and Structure

In the following subsections I present and discuss the effects of various growth scenarios on the population percentage of self-employed with and without employees moderated by development. In each subsection a table is presented with the regression models that build upon each other regarding the growth scenarios, starting very broadly and moving into more specific forms of growth and its moderation by development. The effect of the variables of interest and control variables, on the dependent variable is presented in the tables with the corresponding P-value to determine if the effect can be interpreted as statistically significant, with the exception of the country dummy variables. Additionally, the R squared value of each model is presented.

The structure of the analysis is the following. In the first model I analyse the effect of development and GDP on the dependent variable separately, furthermore I add the discussed control variables, finally the model is completed with the addition of the created relative growth variable

representing the broad relative growth scenario. In the second model I drop the relative growth variable and look at a more specific form of relative growth, for the self-employed with employees variables I add the positive relative growth variable and for the self-employed without employees variables I add the negative relative growth variable. Lastly, in the final model I drop the negative and positive relative growth variables from the corresponding models and add an interaction term between negative relative growth with development for self-employed without employees and positive relative growth with development for self-employed with employees. Model 3 in each subsection serves as the main model to draw conclusions from, answer the research question and confirm or reject the hypothesises presented in this paper.

5.2 Self Employed Males with Employees and Positive Relative Growth

Table 3

Fixed effects regression: Effect of positive relative growth on self-employed males with employees

	Model 1		Model 2		Model 3	
Independent Variables	**Coefficient**	**P-Value**	**Coefficient**	**P-Value**	**Coefficient**	**P-Value**
LogGDP	0.7892**	0.044	0.7325*	0.074	0.7334*	0.074
LogHDI	-10.2833***	0.000	-8.7107**	0.004	-8.5646**	0.004
Tertiary Education	0.0045	0.785	0.0038	0.838	0.0037	0.842
LogPopulationDensity	-3.6995	0.198	-3.9531	0.220	-3.9781	0.217
LogDays2Register	0.0518	0.627	0.0624	0.598	0.0631	0.596
MinimumCapitalRequired	-0.0001	0.919	-0.0002	0.894	-0.0002	0.896
Relative Growth	-0.6442**	0.029				
PositiveRelativeGrowth			-0.8286**	0.039		
PositiveRelativeGrowthplusHDI					-0.9595**	0.039
Constant	-0.2958	0.979	2.5901	0.840	2.6958	0.834
R^2	0.0292		0.0372		0.0375	
Number of Observations	307		227		227	

Note: * p < 0.10, ** p < 0.05, *** p < 0.01. Results from fixed effects regression analysis. Coefficient and significance levels presented.

Table 3 presents the fixed effects regression results of the positive relative growth and its interaction with development on the population percentage of self-employed males with employees

Model 1 shows that relative growth, the main variable of interest, has a statistically significant negative effect (Table 3). This suggests that when there is an increase in relative growth there is a decrease in the percentage of self-employed males with employees. Further, regarding the control variables development has a statistically significant negative effect (Table 3). This implies that as a country develops in terms of the human development index the percentage of self-employed males with employees decreases. On the other GDP has a statistically significant positive effect, which suggests that with an increase in GDP there is an increase in the population percentage of self-employed males with employees (Table 3). Moreover, Model 2 shows that positive relative growth has a statistically significant negative effect (Table 3). With respect to the control variable, the model has in terms of significance levels and coefficients similar results to model 1, except the effect of GDP becoming statistically insignificant.

Finally, the interaction term and the main variable of interest, positive relative growth plus development has a statistically significant negative effect. This indicates that the effect of positive relative growth on the population percentage of self-employed males with employees is moderated by development (Table 3). However, the moderation is negative and not positive as suggested in hypothesis 1. Further, the control variables have similar results to model 2. With the findings of Model 3 the first hypothesis with respect to the male population is rejected.

5.3 Self Employed Females with Employees and Positive Relative Growth

Table 4

Random effects regression: Effect of positive relative growth on self-employed females with employees

	Model 1		Model 2		Model 3	
Independent Variables	**Coefficient**	**P-Value**	**Coefficient**	**P-Value**	**Coefficient**	**P-Value**
LogGDP	-0.0708	0.688	-0.2228	0.147	-0.2229	0.147
LogHDI	-0.6575	0.603	0.0897	0.947	0.0684	0.959
Tertiary Education	-0.0131	0.148	-0.0125	0.204	-0.0125	0.204
LogPopulationDensity	1.4848	0.263	1.5203	0.283	1.5237	0.282
LogDays2Register	-0.0596	0.315	-0.0597	0.350	-0.0598	0.350
MinimumCapitalRequired	-0.0004	0.500	-0.0007	0.333	-0.0007	0.334
Relative Growth	0.1593	0.143				
Positive Relative Growth			0.1208	0.556		
PositiveRelativeGrowthplusHDI					0.1400	0.559
Constant	-3.4079	0.588	0.8161	0.900	0.7999	0.901
R^2	0.9364		0.9336		0.9336	
Number of Observations	301		222		222	

Note: * p < 0.10, ** p < 0.05, *** p < 0.01. Results from random effects regression analysis. Coefficient and significance levels presented.

Table 4 presents the random effects regression analysis of the positive relative growth and its interaction with development on the population percentage of self-employed females with employees.

Model 1 shows that the variable of interest relative growth has a positive effect on the population percentage of self-employed females with employees, however this effect is insignificant (Table 4). Further, regarding the control variables none of them have statistically significant effects on the population percentage (Table 4). Moreover, Model 2 shows the variable of interest, positive relative growth, has a positive but statistically insignificant effect. Further, similarly to Model 1 none of the control variables are significant (Table 4).

Finally, Model 3, shows that the main variable of interest positive relative growth plus HDI has a positive but statistically insignificant effect (Table 4). This indicates that the effect of growth on the population percentage of self-employed females with employees is not moderated by development. Interestingly, GDP and development separately also do not have statistically significant effects on the population percentage of self-employed females with employees (Table 4). Given the results of Model 3 the first hypothesis with respect to the female population is rejected.

5.4 Self Employed Males without Employees and Negative Relative Growth

Table 5

Random effects regression: Effect of negative relative growth on self-employed males without employees

	Model 1		Model 2		Model 3	
Independent Variables	**Coefficient**	**P-Value**	**Coefficient**	**P-Value**	**Coefficient**	**P-Value**
LogGDP	-0.4514	0.641	-0.6345	0.633	-0.6516	0.624
LogHDI	-9.4027	0.604	-21.9554**	0.030	-21.9556**	0.030
Tertiary Education	-0.0179	0.824	0.1501	0.110	0.1499	0.110
LogPopulationDensity	1.2202	0.834	-12.0337**	0.045	-11.9789**	0.047
LogDays2Register	-0.2966	0.251	-0.1875	0.736	-0.1898	0.732
MinimumCapitalRequired	0.0047	0.115	-0.0048	0.801	-0.0052	0.786
Relative Growth	0.1058	0.881				
Negative Relative Growth			0.0102	0.990		
NegativeRelativeGrowthplusHDI					0.0663	0.940
Constant	26.1398	0.211	85.0265**	0.011	85.2583**	0.010
R^2	0.9689		0.9908		0.9908	
Number of Observations	310		80		80	

Note: * p < 0.10, ** p < 0.05, *** p < 0.01. Results from random effects regression analysis. Coefficient and significance levels presented.

Table 5 presents the random effects regression analysis of negative relative growth and its interaction with development on the percentage of self-employed males with employees.

Model 1 looks at the effect of relative growth on self-employed males without employees. The effect is positive but statistically insignificant (Table 5). Additionally, none of the control variables have statistically significant effects (Table 5). Furthermore, Model 2 looks at the more specific growth scenario, negative relative growth, and shows that the effect is positive however statistically insignificant (Table 5). Further, the control variables show some interesting insights, both population density and a country's development have statistically significant negative results on the population percentage of self-employed males without employees (Table 5). This suggests two things, first as a country increases in development there is a large decrease in the population percentage of self-employed males without employees and second as the population density of a country sees a marginal increase this results in a decrease in the population percentage as well.

Lastly, Model 3 with the interaction term between negative relative growth and development shows that effect is indeed positive but statistically insignificant and thus not representative of the total population investigated (Table 5). Further, the results regarding the control variables are similar in coefficients and significance levels to Model 2. Given the findings of Model 3 the second hypothesis with respect to the male population is rejected.

5.5 Self Employed Females without Employees and Negative Relative Growth

Table 6

Random effects regression: Effect of negative relative growth on self-employed females without employees

	Model 1		Model 2		Model 3	
Independent Variables	**Coefficient**	**P-Value**	**Coefficient**	**P-Value**	**Coefficient**	**P-Value**
LogGDP	-0.4001	0.552	-1.0581	0.143	-1.0711	0.136
LogHDI	-5.7871	0.663	-27.6855**	0.007	-27.5517**	0.007
Tertiary Education	0.0378	0.500	0.1906**	0.018	0.1903**	0.018
LogPopulationDensity	1.2049	0.771	-7.1156	0.181	-7.0722	0.183
LogDays2Register	-0.2138	0.262	-0.2697	0.475	-0.2704	0.472
MinimumCapitalRequired	0.0063*	0.083	-0.0123	0.224	-0.0125	0.212
Relative Growth	-0.2373	0.647				
Negative Relative Growth			0.6629	0.278		
NegativeRelativeGrowthplusHDI					0.7787	0.242
Constant	14.2727	0.358	62.0750**	0.025	62.2691**	0.024
R^2	0.9610		0.9860		0.9861	
Number of Observations	310		80		80	

Note: * p < 0.10, ** p < 0.05, *** p < 0.01. Results from random effects regression analysis. Coefficient and significance levels presented.

Table 6 presents the random effects regression analysis of negative relative growth and its interaction with development on the percentage of self-employed females with employees.

Model 1 shows that relative growth has a negative but statistically insignificant effect on the population percentage self-employed females without employees (Table 6). From the control variables none of them have a statistically significant effect on the population percentage. Moreover, Model 2 with the more specific positive relative growth variables, shows that this variable has a positive effect, however again statistically insignificant (Table 6). Further, regarding the control variables development has a large statistically significant negative effect and tertiary education has a statistically significant positive effect (Table 6). Again, suggesting that as a country increases in development the population percentage decreases and the population percentage of self-employed females without employees increasing as the percentage of individuals with tertiary education in a country increases as well.

Lastly, model 3, with the main variable of interest negative relative growth plus HDI, shows that the interaction term between negative growth and a countries development is positive but statistically insignificant (Table 6). Additionally, the control variables are similar to model 2 in coefficients and significance levels. With the findings of Model 3 the second hypothesis with respect to the female population is rejected.

5.6 R Squared of the Models

The R squared value indicates the explanatory power of a model, that is how much the explanatory variables in the regression model explain the variation present in the dependent variable. Here I discuss how the R squared of each model changed when adding more specific growth variables and the interaction term. This is to observe whether the addition of the more specific growth variable is relevant in explaining any differences in the dependent variable.

For the model of subsections 5.2 the addition of the more specific growth models improved the explanatory power of the models by increasing the R squared value by roughly 1% (Table 3). Further, the models of subsections 5.4 and 5.5 see increases of the explanatory power by 2% each (Table 5; Table 6). Additionally, the models with the interaction term for these subsections have the highest explanatory power. Thus, showing that using specific forms of growth in investigating the variation in the dependent variable is somewhat more relevant.

However, when critically assessing the changes in R squared values, the addition of the more specific growth variables in the model of subsections 5.3 did not improve the explanatory power (Table 4). In fact, the model with the broad growth variable had the highest explanatory power and the addition of the more specific growth variables decreased the power. Further illustrating the lack of relevance the specific growth scenario had in explaining the variance in the dependent variable.

5.7 Growth as a Dummy Variable in Regression Analysis

To compare the main regression results of this paper I test the hypothesis using fixed and random effects regressions with dummy variables for negative relative growth as well as positive relative growth and their interaction with development. This looks at how the dependent variables are affected by the mere situation of negative or positive growth and not at how the magnitude of the growth may affect the dependent variables. Interestingly, the results of the regression of self-employed males and females with employees and positive growth confirm the main result with respect to females. However, with respect to the male population the dummy variable for positive relative growth interacted with development is insignificant, contrary to the results presented in this paper. Further, the results of the regression concerning self-employed males and females without employees show that negative relative growth is not moderated by development as the results are slightly insignificant, further corroborating the results presented in this paper.

However, again it would be misleading to draw any conclusions from these regressions as upon further investigation the variables of interest for all models suffered from high collinearity values.

6. Discussion and Conclusion

With this thesis I attempt to investigate how economic development influences entrepreneurial entry by answering the following research question:

How do differences in economic development of countries influence various growth scenarios in their effect on entrepreneurial entry?

Given the results from the econometric analysis I conclude that differences in country development do negatively moderate positive relative growth in its effect on the entry rate of self-employed males with employees. However, differences in country development do not moderate positive relative growth in its effect on the entry of self-employed females with employees. Furthermore, the effect of negative relative growth on the entry of self-employed males and females without employees is also not moderated by country development.

My first effort to answer the research question is through my first hypothesis "The positive effect of positive growth on percentage of self-employed with employees is moderated by a country's development." I test this hypothesis using fixed and random effects regressions and in both analysis for self-employed males and females with employees the hypothesis is rejected. In my paper I find that development is not a moderator for how relative growth affects entrepreneurial entry for self-employed females with employees and the effect of relative economic growth is in fact statistically insignificant. Further, I find that development is a moderator for positive relative growth regarding its effect on self-employed males with employees, with the interaction term having a statistically significant negative effect. A possible explanation for this being that the relationship between a countries entrepreneurial entry rate and its development level is not U-shaped as proposed by Wennekers, Van Stel, Thurik and Reynolds (2005). In fact, in an assignment during my studies at the Erasmus University Rotterdam my course group investigated the relationship between total early-stage entrepreneurial activity and country development, we found that the curve resembles more an L-Shaped curve than a U-Shaped curve (Beets, Hillebrink, Rama, & Scharnowski, 2020). This implies that for lower levels of country development in terms of GDP per capita there are many different levels of entrepreneurship. Further, as country GDP per capita increases the levels of entrepreneurship decrease and eventually plateau at low levels, indicating that once a certain development level is reached the entrepreneurial levels do not vary significantly. A possible explanation could be that highly developed countries with economic growth an wealth have industries that tend to be dominated by large firms who are responsible for innovation, and take over small business who can't compete against them as implied by a Schumpeter phase 2 economy (Śledzik, 2013). Further, the existing entrepreneurs in developed countries may not support the stimulation of other firms into the market in an attempt to reduce competition. In addition, many individuals in prosperous economic periods may also prefer

to stay employed in these larger companies rather than becoming self-employed in order to benefit from job security and stable wages. Therefore, using this as a foundation, my findings from testing the first hypothesis with respect to women become more relatable, as positive relative growth and its interaction term with development have statistically insignificant effects on the population percentage of self-employed females with employees (Table 4). This idea is also applicable to the male population as positive relative growth has a negative effect on the population percentage and this effect further being negatively moderated by country development. (Table 3).

Moreover, with my additional attempt to answer the main research question I posit the following second hypothesis: "The positive effect of negative growth on the percentage of self-employed without employees is negatively moderated by a country's development.". According to the results presented in my paper I reject the hypothesis for self-employed females and males without entrepreneurs. The results for self-employed males and females without employees show that the interaction terms between negative relative growth and country development have positive effects, however the results are highly insignificant and thus not representative of the total population investigated (Table 5; Table 6). A possible explanation for the lack of significant effect by the variables of interest on the dependent variable is that for each country the dependent variable does not vary significantly over time itself. Therefore, there are no significant changes to be observed. When looking at the population percentages for each country individually the percentages do not change by large amounts, hovering just above or below a certain percentage and not substantially moving up or down from it for a consistent number of years. This is further supported by the standard deviation of the individual countries regarding the dependent variables being very low.

Furthermore, with respect to the control variables I do not find any statistically significant and viable effects. The main issue being that several control variables presented such as Log of population density, Log of GDP, Log of HDI and tertiary education suffer from large collinearity values. Thus, conclusions drawn from these variables must be approached with caution as their coefficient levels may be inflated (Appendix 5).

While the results of the econometric analysis rest on a strong foundation there are multiple aspects that need to be considered when assessing the scientific accuracy of the conclusions drawn from this paper. Firstly, the sample size investigating the second hypothesis is limited which could distort the regression results as few countries in my sample experienced economic decline. Further, the number of countries with lower HDI values is extremely limited in my data, thus my research would benefit from a larger number of countries with lower HDI values.

Secondly and perhaps most critical, my conceptualisation of the dependent variables may not be fully representative. In my research I essentially attempt to look at how necessity and opportunity entrepreneurs are motivated by economic decline as well growth and how this effect is moderated by a country's development. Thus, I conceptualise self-employed without employees as analogue to necessity entrepreneurs and self-employed with employees as opportunity entrepreneurs, with my justification explained in the theoretical framework. This however, does not have to be the case as people who work for themselves without employees do not have to be necessity driven such as solo self-employed individuals in developed countries and people who work for themselves with employees do not have to be opportunity driven. More suitable variables would be the GEMs statistics of opportunity and necessity entrepreneurs. Unfortunately, I was unable to obtain these statistics and upon contact with the GEM they were only able to provide me with the data present on the website, which in terms of entrepreneurial entry, is limited to Total early-stage Entrepreneurial Activity.

Moreover, overall levels of entrepreneurship have been increasing over the years, which may influence the dependent variable studied in my paper (Macharzina, 2000). I do not control for any time effects as my paper mainly looks at the differences in developmental characteristics of countries and their effect on entrepreneurial entry rates by influencing the effect of growth. Further, when controlling for it, the variables of interest become statistically unfeasible to draw conclusions from due to high values of collinearity. However, the paper would benefit from additional control variables for time fixed effects to further isolate the variable of interest. This could possibly be achieved by adding a control variable of the global entrepreneurship levels of each year without rendering the variables unfeasible due to high collinearity values.

The results of my paper may be of interest for the scientific community as it provides more insights in the field of entrepreneurship and country development. Future research could entail replicating my paper with a much larger data set and as aforementioned with the more suitable dependent variables of necessity and opportunity entrepreneurs.

Additionally, I do not investigate how self-employed males and females without employees are affected by positive growth, which could be an interesting research topic for highly developed countries as solo self-employed individuals are a common element of the economy. On the other end of the spectrum, I also do not investigate how self-employed males and females with employees are affected by negative growth. This could be an interesting topic as one could assess how economic decline affects these small businesses who are vital employers within a country (Neumark, Wall, & Zhang, 2011). More specifically, looking at how economic decline affects the number of employees these small businesses keep, which would be interesting to estimate changes in the labour market.

Furthermore, there is a possibility of gender differences that influence entrepreneurial entry that would be an interesting topic to research, as more and more women choose to start their own businesses with different motivations to men (Kirkwood, 2009)

Lastly, my research has an interesting implication for policy makers. As the results suggest that the effect of positive relative growth on the entry of self-employed males with employees decreases with increased country development. This could have undesirable effects for industry competition and employment. Thus, this paper encourages policy makers to observe the entry rate of self-employed males with employees in a period of positive growth and given a decrease support appropriately motivated people to enter the market (Santarelli & Vivarelli, 2007).

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8. Appendices

Appendix 1: Breusch-Pagan Lagrange Multiplier Test Results of Main Models

1.1 Breusch-Pagan Lagrange Multiplier Test for model 3 in section 5.2

Test: Var(u) = 0		
	chibar2(01)	45.3
	Prob > chibar2	0.000

1.2 Breusch-Pagan Lagrange Multiplier Test for model 3 in section 5.3

Test: Var(u) = 0		
	chibar2(01)	577.28
	Prob > chibar2	0.000

1.3 Breusch-Pagan Lagrange Multiplier Test for model 3 in section 5.4

Test: Var(u) = 0		
	chibar2(01)	45.3
	Prob > chibar2	0.000

1.4 Breusch-Pagan Lagrange Multiplier Test for model 3 in section 5.5

Test: Var(u) = 0		
	chibar2(01)	44.49
	Prob > chibar2	0.000

Appendix 2: Hausman Test for Main Models

2.1 Hausman test for model 3 subsection 5.2

Test: Ho: difference in coefficients not systematic		
	chi2(7)	16.81
	Prob>chi2	0.0187

2.2 Hausman test for model 3 subsection 5.3

Test: Ho: difference in coefficients not systematic		
	chi2(7)	8.43
	Prob>chi2	0.2081

2.3 Hausman test for model 3 subsection 5.4

Test: Ho: difference in coefficients not systematic		
	chi2(7)	2.05
	Prob>chi2	0.9568

2.4 Hausman test for model 3 subsection 5.5

Test: Ho: difference in coefficients not systematic		
	chi2(7)	6.9
	Prob>chi2	0.4392

Appendix 3. Jarque-Bera Test on Residuals Result

Jarque-Bera normality test			
P-Value	0.8933	Chi(2)	0.6398
Jarque-Bera test for H0: normality			

Appendix 4. Full Random Effects Regression Results from Section 5

4.1 Full random effects regression results self-employed females with employees and positive growth

Note. Order of country dummies correspond with order of countries presented in Table 2.

VARIABLES	(1) sewefemale	(2) sewefemale	(3) sewefemale
LogGDP	-0.07078	-0.22275	-0.22285
	(0.17638)	(0.15352)	(0.15384)
LogHDI	-0.65749	0.08969	0.06840
	(1.26486)	(1.34469)	(1.34386)
Tertiary Education	-0.01314	-0.01249	-0.01247
	(0.00909)	(0.00983)	(0.00983)
LogPopulationDensity	1.48484	1.52030	1.52370
	(1.32669)	(1.41543)	(1.41597)
LogDays2Reg	-0.05962	-0.05972	-0.05983
	(0.05934)	(0.06387)	(0.06404)
MinCapReq	-0.00044	-0.00067	-0.00067
	(0.00065)	(0.00070)	(0.00070)
Relative Growth	0.15932		
	(0.10874)		
o.country1	-	-	-
country2	1.36140***	1.06527***	1.06629***
	(0.33018)	(0.32792)	(0.32744)
country3	-0.68490	-0.97527	-0.97853
	(1.62730)	(1.70554)	(1.70792)
o.country4	-	-	-
o.country5	-	-	-
o.country6	-	-	-
country7	0.19264	-0.13529	-0.13535
	(0.57877)	(0.58782)	(0.58943)
country8	0.13283	-0.20717	-0.20689
	(0.46607)	(0.45542)	(0.45658)
country9	2.18673	1.60854	1.61275
	(1.62254)	(1.76470)	(1.76116)
country10	3.58777	3.29304	3.30002
	(2.40844)	(2.60378)	(2.60237)
o.country11	-	-	-

country12	0.23336	0.23962	0.23847
	(0.93226)	(1.02536)	(1.02598)
country13	3.07664***	2.79299***	2.79424***
	(0.36477)	(0.37391)	(0.37263)
country14	1.63184***	1.28472***	1.28465***
	(0.42806)	(0.39425)	(0.39515)
country15	6.02276	5.49558	5.50769
	(4.53320)	(4.90322)	(4.90005)
o.country16	-	-	-
o.country17	-	-	-
country18	1.50915*	1.57885*	1.57761*
	(0.83546)	(0.92190)	(0.92243)
o.country19	-	-	-
country20	2.25118*	1.71022	1.71471
	(1.33464)	(1.41234)	(1.40848)
country21	1.24605	0.74938	0.75212
	(1.12578)	(1.23883)	(1.23602)
country22	-0.51502	-1.12323	-1.12519
	(1.27351)	(1.25747)	(1.26057)
o.country23	-	-	-
country24	-1.34022	-1.54320	-1.54755
	(1.97452)	(2.09345)	(2.09561)
o.country25	-	-	-
country26	2.99830	2.81871	2.82663
	(2.81604)	(3.04911)	(3.04775)
country27	1.25661***	1.09212***	1.09224***
	(0.37692)	(0.38623)	(0.38686)
country28	1.78180***	1.58785***	1.58754***
	(0.37083)	(0.37147)	(0.37251)
country29	0.33165	-0.09813	-0.09801
	(0.53819)	(0.49539)	(0.49633)
country30	0.67872	0.11707	0.11774
	(0.61673)	(0.56231)	(0.56225)
o.country31	-	-	-
country32	0.22609	0.13584	0.13116
	(1.94990)	(2.06551)	(2.06671)
country33	2.44967***	2.36189***	2.36316***
	(0.30305)	(0.33922)	(0.33907)
country34	2.78636	2.57063	2.57685
	(2.08052)	(2.24713)	(2.24612)
country35	1.21524	0.94873	0.94784
	(0.85641)	(0.88843)	(0.89018)
o.country36	-	-	-
o.country37	-	-	-
o.country38	-	-	-
PositiveRelativeGrowth		0.12083	
		(0.20522)	
PositiveRelativeGrowthplusHDI			0.13995
			(0.23971)

Constant	-3.40788	0.81681	0.79990
	(6.29792)	(6.47453)	(6.45610)
Observations	301	222	222
Number of countrycategories	25	25	25
Robust standard errors in parentheses			
*** p<0.01, ** p<0.05, * p<0.1			

4.2 Full random effects regression results self-employed males without employees and negative growth

VARIABLES	(1) sewoemale	(2) sewoemale	(3) sewoemale
LogGDP	-0.45144	-0.63454	-0.65160
	(0.96762)	(1.32959)	(1.33011)
LogHDI	-9.40274	-21.95539**	-21.95557**
	(18.10516)	(10.12852)	(10.10806)
Tertiary Education	-0.01791	0.15013	0.14988
	(0.08052)	(0.09400)	(0.09388)
LogPopulationDensity	1.22022	-12.03371**	-11.97886**
	(5.81781)	(6.01451)	(6.03387)
LogDays2Reg	-0.29657	-0.18753	-0.18977
	(0.25833)	(0.55556)	(0.55398)
MinCapReq	0.00468	-0.00483	-0.00516
	(0.00297)	(0.01914)	(0.01904)
Relative Growth	0.10581		
	(0.70715)		
o.country1	-	-	-
country2	-12.55459***	-11.45558***	-11.44597***
	(2.69389)	(1.92076)	(1.91175)
country3	-10.26413	6.77637	6.70109
	(8.65017)	(7.93621)	(7.96971)
o.country4	-	-	-
o.country5	-	-	-
o.country6	-	-	-
country7	-5.27986	1.70714	1.67733
	(4.45230)	(3.27587)	(3.28787)
country8	-14.21753***	-9.99963***	-10.02395***
	(3.87149)	(2.92521)	(2.93294)
country9	-13.48148**	-31.29100***	-31.28167***
	(5.28495)	(7.06656)	(7.05891)
country10	-7.07014	-30.76035***	-30.67985***
	(9.36928)	(10.71305)	(10.72898)
o.country11	-	-	-
country12	-12.96759**	0.41085	0.40088
	(5.75678)	(4.30017)	(4.31050)
country13	3.91146*	3.32404*	3.32174*
	(2.02703)	(1.75455)	(1.74823)
country14	-14.03278***	-12.36646***	-12.39761***
	(3.00213)	(3.07369)	(3.07863)
country15	-6.62203	-53.28451***	-53.15768***
	(17.26278)	(19.12189)	(19.15820)

o.country16	-	-	-
o.country17	-	-	-
country18	-1.05933	11.01576***	10.99289***
	(5.23762)	(4.16776)	(4.17817)
o.country19	-	-	-
country20	-13.83766***	-27.95761***	-27.94502***
	(4.24492)	(6.11696)	(6.11235)
country21	-9.82323***	-22.12781***	-22.12925***
	(3.35243)	(5.02038)	(5.00977)
country22	-16.30512**	-7.03104	-7.10945
	(7.20578)	(6.73517)	(6.76191)
o.country23	-	-	-
country24	-11.06522	11.91898	11.84814
	(10.12213)	(9.09315)	(9.13021)
o.country25	-	-	-
country26	-10.18073	-37.27646***	-37.17418***
	(10.88327)	(12.11002)	(12.13373)
country27	-3.15179	0.20242	0.18716
	(2.60575)	(1.69002)	(1.69538)
country28	-7.62469***	-3.64841	-3.67124
	(2.91970)	(2.64474)	(2.65011)
country29	-6.51661*	-2.79224	-2.82997
	(3.61629)	(3.29614)	(3.30376)
country30	-11.19769***	-9.70171**	-9.73898**
	(4.15661)	(4.38251)	(4.38407)
o.country31	-	-	-
country32	-0.12329		
	(9.28371)		
country33	-5.75634***	-6.81850***	-6.79814***
	(1.85497)	(2.23557)	(2.22656)
country34	-9.95272	-29.50081***	-29.42256***
	(8.07558)	(9.27256)	(9.28688)
country35	-13.16140**	-4.09124	-4.12619
	(5.53456)	(4.17360)	(4.19289)
o.country36	-	-	-
o.country37	-	-	-
o.country38	-	-	-
NegativeRelativeGrowth		0.01018	
		(0.83030)	
o.country32		-	-
NegativeRelativegGrowthplusHDI			0.06631
			(0.87923)
Constant	26.13976	85.02650**	85.25833**
	(20.89063)	(33.31417)	(33.25294)
Observations	310	80	80
Number of countrycategories	25	24	24

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.3 Full random effects regression results self-employed females without employees and negative growth

VARIABLES	(1) sewoefemale	(2) sewoefemale	(3) sewoefemale
LogGDP	-0.40012	-1.05812	-1.07108
	(0.62498)	(0.72237)	(0.71843)
LogHDI	-5.78712	-27.68552***	-27.55173***
	(13.29365)	(10.25235)	(10.23169)
Tertiary Education	0.03784	0.19063**	0.19031**
	(0.05609)	(0.08057)	(0.08032)
LogPopulationDensity	1.20487	-7.11557	-7.07218
	(4.13690)	(5.31340)	(5.31061)
LogDays2Reg	-0.21381	-0.26972	-0.27038
	(0.19045)	(0.37753)	(0.37622)
MinCapReq	0.00634*	-0.01225	-0.01253
	(0.00365)	(0.01008)	(0.01005)
Relative Growth	-0.23730		
	(0.51881)		
o.country1	-	-	-
country2	-4.66012**	-2.09965	-2.10042
	(2.11973)	(1.58156)	(1.57718)
country3	-5.60163	6.31376	6.24594
	(5.98581)	(6.64276)	(6.64130)
o.country4	-	-	-
o.country5	-	-	-
o.country6	-	-	-
country7	-2.37447	3.78242	3.74982
	(3.12694)	(2.45691)	(2.45326)
country8	-8.20554***	-4.25059**	-4.27907**
	(2.78266)	(2.02115)	(2.01843)
country9	-7.17562*	-19.42875***	-19.42314***
	(4.28734)	(6.93055)	(6.91120)
country10	-2.63661	-16.84963*	-16.79517*
	(7.13895)	(10.00879)	(9.99727)
o.country11	-	-	-
country12	-5.83601	5.84359	5.82277
	(4.11842)	(4.36338)	(4.35739)
country13	6.12775***	7.08941***	7.08201***
	(1.65614)	(1.60899)	(1.60263)
country14	-6.44119***	-5.19760***	-5.22697***
	(2.07070)	(1.61769)	(1.61200)
country15	-2.38691	-32.23539*	-32.14304*
	(12.88029)	(18.48809)	(18.46648)
o.country16	-	-	-
o.country17	-	-	-
country18	2.73559	12.13146***	12.10383***
	(3.73764)	(3.98441)	(3.97813)
o.country19	-	-	-
country20	-5.73670*	-15.62917**	-15.63123**

	(3.40228)	(6.13621)	(6.12144)
country21	-4.05847	-12.78830***	-12.79179***
	(2.83961)	(4.85601)	(4.83872)
country22	-7.57064	-1.85944	-1.92862
	(4.89007)	(4.70816)	(4.70468)
o.country23	-	-	-
country24	-4.93014	11.58800	11.52269
	(7.08154)	(8.15202)	(8.14820)
o.country25	-	-	-
country26	-5.12392	-20.42734*	-20.35665*
	(8.15915)	(11.14937)	(11.13958)
country27	0.33526	3.20025**	3.18079**
	(1.90077)	(1.53312)	(1.53127)
country28	3.07256	5.24394***	5.22407***
	(2.02520)	(1.57519)	(1.57109)
country29	-3.98088	-1.14024	-1.17576
	(2.51799)	(2.16204)	(2.15435)
country30	-6.56848**	-5.45133**	-5.48670**
	(2.94980)	(2.41671)	(2.40316)
o.country31	-	-	-
country32	1.19164		
	(6.64403)		
country33	-1.61652	-0.90868	-0.90126
	(1.61022)	(1.68646)	(1.68385)
country34	-5.00460	-15.79150*	-15.74036*
	(6.13472)	(8.44444)	(8.43645)
country35	-4.56438	3.10293	3.06204
	(3.89246)	(3.63713)	(3.63665)
o.country36	-	-	-
o.country37	-	-	-
o.country38	-	-	-
NegativeRelativeGrowth		0.66290	
		(0.61142)	
o.country32		-	-
NegativeRelativeGrowthplusHDI			0.77866
			(0.66484)
Constant	14.27272	62.07503**	62.26907**
	(15.51932)	(27.73765)	(27.61665)
Observations	310	80	80
Number of countrycategories	25	24	24
Robust standard errors in parentheses			
*** p<0.01, ** p<0.05, * p<0.1			

Appendix 5. VIF Test Results for Main Models

5.1 VIF tests for models in subsection 5.2

VIF Self-employed males with employees with positive relative growth plus HDI

	VIF	1/VIF
LogPopulationDensity	2404.293	0
countries==Belgium	1634.066	.001
countries==Germany	1544.538	.001
countries==Switzerland	1363.893	.001
countries==Luxembourg	1297.305	.001
countries==Denmark	1208.853	.001
countries==Slovak Republic	1166.568	.001
countries==Netherlands	1140.31	.001
countries==Poland	1110.035	.001
countries==Hungary	1057.765	.001
countries==Slovenia	990.791	.001
countries==Spain	920.378	.001
countries==Austria	898.376	.001
countries==Italy	838.566	.001
countries==Czech Republic	776.175	.001
countries==Turkey	758.881	.001
countries==South Korea	753.803	.001
countries==Portugal	522.176	.002
countries==Greece	422.94	.002
countries==Estonia	411.876	.002
countries==Lithuania	368.681	.003
countries==Sweden	327.014	.003
countries==Latvia	235.272	.004
countries==Finland	232.668	.004
LogGDP	169.749	.006
countries==Norway	166.001	.006
LogHDI	29.05	.034
Tertiary Education	26.176	.038
MinCapReq	5.501	.182
LogDays2Reg	3.563	.281
PositiveRelativeGrowthplusHDI	1.736	.576
Mean VIF	735.064	.

5.2 VIF test for main model in subsection 5.3

VIF Self-employed females with employees with positive relative growth plus hdi

	VIF	1/VIF
LogPopulationDensity	2788.166	0
countries==Belgium	1917.413	.001
countries==Germany	1803.402	.001
countries==Switzerland	1600.026	.001
countries==Luxembourg	1529.238	.001
countries==Denmark	1415.594	.001
countries==Slovak Republic	1374.421	.001
countries==Netherlands	1337.462	.001
countries==Poland	1303.064	.001

countries==Hungary	1242.21	.001
countries==Spain	1075.537	.001
countries==Slovenia	1064.084	.001
countries==Austria	1054.092	.001
countries==Italy	980.059	.001
countries==Czech Republic	913.96	.001
countries==Turkey	885.047	.001
countries==South Korea	882.621	.001
countries==Portugal	613.134	.002
countries==Greece	496.302	.002
countries==Estonia	398.159	.003
countries==Sweden	379.461	.003
countries==Lithuania	368.418	.003
countries==Latvia	278.001	.004
countries==Finland	270.785	.004
countries==Norway	171.941	.006
LogGDP	171.884	.006
LogHDI	28.613	.035
Tertiary Education	27.961	.036
MinCapReq	5.761	.174
LogDays2Reg	3.594	.278
PositiveRelativeGrowthplusHDI	1.693	.591
Mean VIF	851.035	.

5.3 VIF test for main model from subsection 5.4

VIF self-employed males without employees and negative relative growth plus hdi

	VIF	1/VIF
LogPopulationDensity	4580.646	0
countries==Belgium	3458.414	0
countries==Germany	2927.249	0
countries==Switzerland	2623.667	0
countries==Austria	2295.606	0
countries==Italy	2137.059	0
countries==Luxembourg	2089.317	0
countries==Poland	2081.667	0
countries==Netherlands	2011.184	0
countries==Slovenia	1935.893	.001
countries==Spain	1777.654	.001
countries==Denmark	1628.159	.001
countries==Slovak Republic	1544.144	.001
countries==Hungary	1526.452	.001
countries==Turkey	1483.329	.001
countries==Greece	1301.262	.001
countries==Czech Republic	1150.735	.001
countries==Lithuania	1139.061	.001
countries==Estonia	813.3	.001
countries==Sweden	647.36	.002
LogGDP	644.059	.002
countries==Portugal	549.841	.002
countries==Finland	458.281	.002
countries==Norway	382.648	.003
countries==Latvia	236.952	.004
Tertiary Education	48.816	.02
LogHDI	37.883	.026
LogDays2Reg	10.866	.092

MinCapReq	5.35	.187
NegativeRelativeGrowthplusHDI	1.599	.626
Mean VIF	1384.282	.

5.4 VIF test for all models in subsection 5.5

VIF self-employed females without employees and negative relative growth

	VIF	1/VIF
LogPopulationDensity	4580.646	0
countries==Belgium	3458.414	0
countries==Germany	2927.249	0
countries==Switzerland	2623.667	0
countries==Austria	2295.606	0
countries==Italy	2137.059	0
countries==Luxembourg	2089.317	0
countries==Poland	2081.667	0
countries==Netherlands	2011.184	0
countries==Slovenia	1935.893	.001
countries==Spain	1777.654	.001
countries==Denmark	1628.159	.001
countries==Slovak Republic	1544.144	.001
countries==Hungary	1526.452	.001
countries==Turkey	1483.329	.001
countries==Greece	1301.262	.001
countries==Czech Republic	1150.735	.001
countries==Lithuania	1139.061	.001
countries==Estonia	813.3	.001
countries==Sweden	647.36	.002
LogGDP	644.059	.002
countries==Portugal	549.841	.002
countries==Finland	458.281	.002
countries==Norway	382.648	.003
countries==Latvia	236.952	.004
Tertiary Education	48.816	.02
LogHDI	37.883	.026
LogDays2Reg	10.866	.092
MinCapReq	5.35	.187
NegativeRelativeGrowthplusHDI	1.599	.626
Mean VIF	1384.282	.