

# GOVERNMENTAL INSTITUTIONS AND THE GENDER GAP IN ENTREPRENEURSHIP

A cross-country multilevel analysis on the  
effect of the institutional environment on the  
gender gap in entrepreneurship

## Abstract

Previously published literature provides extensive research about the effect of the institutional environment on one's entrepreneurial activity, and separately on the gender gap in entrepreneurship. In this paper it is tested if the relationship of governmental institutions such as education, government size, business regulations, governmental stability, income regulations and government support policies with entrepreneurial activity is different for men and women. This is examined to try and combine the two related literature streams. I use individual level data on 118,795 individuals from the Adult Population Survey collected by the General Entrepreneurship Monitor (GEM) in 2017 and institutional data on national level from 50 different countries. Since the data is nested on two levels, a multilevel logistic regression is performed. The hypotheses are tested through the interaction terms of the different governmental institutions with gender on the entrepreneurial activity rate. These estimates suggest that women are less likely to be engaged in entrepreneurial activity in comparison to men. The results demonstrate that the suspected negative effect of a high regulatory burden on entrepreneurial activity is weakened for women compared to men. Thus, more regulations induce more women than men into entrepreneurial activity. Additionally, the negative effect of a larger government size on entrepreneurial activity is found to be significantly stronger for women than for men. Also, a more stable government is suspected to induce fewer women than men in entrepreneurial activity. For the institutions of education, income regulations and government support policies, no statistically significant mediating relationship between gender and entrepreneurial activity is found. These results suggest that policy makers have to be aware of the impact of governmental institutions in order to encourage more women to participate in entrepreneurship and to attempt to decrease the gender gap in entrepreneurship.

Name student: Luna Werleman

Student number: 504001

Supervisor: D. Muslimova

Date final version: 30 June, 2022

The views stated in this thesis are those of the author and not necessarily those of the supervisor, second assessor, Erasmus School of Economics or Erasmus University Rotterdam.

# List of content

- 1. Introduction ..... 5**
- 2. Literature review and hypotheses building ..... 9**
  - 2.1 Background..... 9*
    - 2.1.1 Entrepreneurship ..... 9
    - 2.1.2 Entrepreneurship and the gender gap ..... 10
    - 2.1.3 Entrepreneurship and institutions ..... 13
    - 2.1.4 Effect of institutions on female entrepreneurship ..... 14
  - 2.2 Literature and hypothesis building..... 15*
    - 2.2.1 Women engaging in entrepreneurship..... 15
    - 2.2.2 Government size ..... 15
    - 2.2.3 Education ..... 16
    - 2.2.4 Regulatory business environment ..... 18
    - 2.2.6 Income regulations ..... 20
    - 2.2.7 Government support policies ..... 21
- 3. Data and methodology..... 22**
  - 3.1 Data sources..... 22*
  - 3.2 Variables..... 23*
    - 3.2.1. Individual level data ..... 23
    - 3.2.2. Country level variables ..... 25
  - 3.3. Descriptive statistics..... 26*
  - 3.2 Methodology ..... 27*
    - 3.2.1 Multilevel logistic regression ..... 27
    - 3.2.2. Justification of the model ..... 29
    - 3.2.3. Complete specification ..... 33
- 4. Results ..... 33**
  - 4.1. Individual level control variables..... 34*
  - 4.2. Country level control variables..... 34*
  - 4.3. Country level determinants ..... 35*
  - 4.4. Interaction of individual and country level determinants ..... 35*
- 5. Robustness analyses ..... 42**
  - 5.1. Country control variables from 2016 ..... 42*
  - 5.2. Alternative measures ..... 42*
  - 5.3. Alternative sample ..... 44*
  - 5.4. Alternative method ..... 45*
  - 5.5. Good controls ..... 47*
- 6. Conclusion, discussion and limitations ..... 47**
  - 6.1. Conclusion ..... 48*
  - 6.2. Discussion ..... 49*
  - 6.3. Limitations ..... 52*
- References ..... 55**

<b>Appendix .....</b>	<b>67</b>
<i>Appendix A – countries in sample .....</i>	<i>67</i>
<i>Appendix B – control variables.....</i>	<i>69</i>
<i>Appendix C – results of OLS of gender on control variables.....</i>	<i>71</i>
<i>Appendix D – pairwise correlation .....</i>	<i>73</i>
<i>Appendix E – VIF score.....</i>	<i>75</i>
<i>Appendix F – ICC and null model.....</i>	<i>76</i>
<i>Appendix G – results of CIM and AIM .....</i>	<i>77</i>
<i>Appendix H – results of regression separately for men and women.....</i>	<i>79</i>
<i>Appendix I – results with control variables from 2016.....</i>	<i>83</i>
<i>Appendix J – results with alternative measures.....</i>	<i>87</i>
<i>Appendix K – extensive interpretation of results of alternative model.....</i>	<i>91</i>
<i>Appendix L – countries in alternative sample .....</i>	<i>93</i>
<i>Appendix M – results from regression in alternative sample.....</i>	<i>95</i>
<i>Appendix N – countries in fixed effects model .....</i>	<i>99</i>
<i>Appendix O – results of fixed effects regression .....</i>	<i>100</i>
<i>Appendix P – results of regression excluding bad controls .....</i>	<i>102</i>

## List of tables

TABLE 1: DESCRIPTIVE STATISTICS .....	28
TABLE 2: REGRESSION RESULTS FROM THE MULTILEVEL LOGISTIC REGRESSION WITH TEA AS DEPENDENT VARIABLE AND RANDOM SLOPES FOR FEMALE. ....	39
TABLE 3: ODDS RATIO RESULTS FROM THE MULTILEVEL LOGISTIC REGRESSION WITH TEA AS DEPENDENT VARIABLE AND RANDOM SLOPES FOR FEMALE. ....	41
TABLE 4: EXPLANATION OF THE VARIABLES USED IN THE EMPIRICAL MODEL.....	69
TABLE 5: REGRESSION RESULTS OF THE OLS ESTIMATE OF GENDER ON THE DIFFERENT INDIVIDUAL LEVEL CONTROL VARIABLES.....	71
TABLE 6: PAIRWISE CORRELATION OF ALL VARIABLES .....	73
TABLE 7: VIF SCORES OF ALL VARIABLES .....	75
TABLE 8: LOGISTIC REGRESSION RESULTS OF THE NULL MODEL.....	76
TABLE 9: ESTIMATIONS OF CIM MODEL AND THE AIM MODEL WITH RANDOM SLOPES FOR FEMALE .....	77
TABLE 10: REGRESSION RESULTS FROM THE MULTILEVEL LOGISTIC REGRESSION WITH TEA AS DEPENDENT VARIABLE FOR A SAMPLE OF MEN .....	79
TABLE 11: REGRESSION RESULTS FROM THE MULTILEVEL LOGISTIC REGRESSION WITH TEA AS DEPENDENT VARIABLE FOR A SAMPLE OF WOMEN.....	81
TABLE 12: REGRESSION RESULTS FROM THE MULTILEVEL LOGISTIC REGRESSION WITH TEA AS DEPENDENT VARIABLE AND RANDOM SLOPES FOR FEMALE WITH CONTROL VARIABLES FROM 2016 .....	83
TABLE 13: ODDS RATIOS FROM THE MULTILEVEL LOGISTIC REGRESSION WITH TEA AS DEPENDENT VARIABLE AND RANDOM SLOPES FOR FEMALE WITH CONTROL VARIABLES FROM 2016.....	85
TABLE 14: REGRESSION RESULTS FROM THE MULTILEVEL LOGISTIC REGRESSION WITH TEA AS DEPENDENT VARIABLE AND RANDOM SLOPES FOR FEMALE WITH DIFFERENT MEASURES FOR THE GOVERNMENTAL INSTITUTIONS.....	87
TABLE 15: ODDS RATIO FROM THE MULTILEVEL LOGISTIC REGRESSION WITH TEA AS DEPENDENT VARIABLE AND RANDOM SLOPES FOR FEMALE WITH DIFFERENT MEASURES FOR THE GOVERNMENTAL INSTITUTIONS.....	89
TABLE 16: REGRESSION RESULTS FROM THE MULTILEVEL LOGISTIC REGRESSION WITH TEA AS DEPENDENT VARIABLE AND RANDOM SLOPES FOR FEMALE FROM THE ALTERNATIVE SAMPLE EXCLUDING SPAIN.....	95
TABLE 17: ODDS RATIO FROM THE MULTILEVEL LOGISTIC REGRESSION WITH TEA AS DEPENDENT VARIABLE AND RANDOM SLOPES FOR FEMALE WITH THE ALTERNATIVE SAMPLE EXCLUDING SPAIN .....	97
TABLE 18: REGRESSION RESULTS FROM THE MULTILEVEL LOGISTIC REGRESSION WITH TEA AS DEPENDENT VARIABLE AND RANDOM SLOPES FOR FEMALE ESTIMATED WITH THE FIXED EFFECTS METHOD .....	100
TABLE 19: REGRESSION RESULTS FROM THE MULTILEVEL LOGISTIC REGRESSION WITH TEA AS DEPENDENT VARIABLE AND RANDOM SLOPES FOR FEMALE EXCLUDING THE INDIVIDUAL LEVEL CONTROL VARIABLES THAT MIGHT BE A MECHANISM .....	102
TABLE 20: ODDS RATIO FROM THE MULTILEVEL LOGISTIC REGRESSION WITH TEA AS DEPENDENT VARIABLE AND RANDOM SLOPES FOR FEMALE EXCLUDING THE INDIVIDUAL LEVEL CONTROL VARIABLES THAT MIGHT BE A MECHANISM .....	104

## 1. Introduction

Even though men and women are equal by law, women tend to experience inequality in various ways. Until the 1900's women were still legally dependent on their husbands (Queen's Printer of Acts of Parliament, 1882). In the Netherlands it was not until 1956 that women were allowed to open a bank account or travel without permission of their husband (Historiek, 2021). From there on women's rights became more equal to those of men. It was not until 1919 that women had voting rights, which introduced more equality between the genders (Library of Congress, 2021). Gradually women became more self-competent and gained similar legal rights as men over the 19<sup>th</sup> century. It is overall considered that today men and women are legally equal, but some say this is still not the case. An example of the gap in legal rights is provided by research from The World Bank (2019) that suggests that in only six countries men and women have completely equal rights. The legal gender gap provided a huge setback to women. The initial disadvantage of women in the legal department does not stand on its own. According to the OECD (2016) women have lower activity rates in entrepreneurship compared to men. Women's lower activity rate in entrepreneurship is often referred to as the gender gap<sup>1</sup> in entrepreneurship. Fortunately, the gender gap has been slowly closing over the years. Year by year there is a rising number of women that feel capable of undertaking entrepreneurial activities or are willing to become an entrepreneur. In the last ten years the ratio of female and male Total Early-stage Entrepreneurial Activity (TEA) in the Netherlands rose with 75% (General Entrepreneurship Monitor, 2020). There are various special programs and foundations such as IWEC foundation and WEgate connect that stimulate female entrepreneurs as an attempt in closing the gender gap in entrepreneurship (Svelander, 2022.; WEgate, 2021).

Historically, statements of lower engagement in entrepreneurship by women are also supported by findings in the literature about entrepreneurship and gender (Baughn et al., 2006). Next to internal factors that can influence this difference; such as different personalities, characteristics and stereotypes, the entrepreneurial gap can also be explained by environmental factors (Balachandra et al., 2019; Bergmann & Stephan, 2013; Santos et al., 2016). One of these environmental factors is the institutional environment. According to Chowdhury et al. (2018) governmental institutions are an important determinant of entrepreneurial activity in a country. It seems clear from previous research that institutions such as education, government size, business regulations, governmental stability, income regulations and government support policies influence the entrepreneurial activity (Chowdhury et al., 2015; Darnihamedani et al., 2018; Dutta & Sobel, 2016; Hasan et al., 2017; Parker,

---

<sup>1</sup> In this research the 'gender gap' means the gap in entrepreneurial activity between men and women

2007; Sternberg, 2014). Does this mean that governmental institutions can be influential to one's entrepreneurial undertake, specifically for female entrepreneurs? Do certain institutions affect female entrepreneurship differently than male entrepreneurship? And does this mean that the government can find potential in altering their institutions to increase encouragement for female entrepreneurs? In order to find an answer to these questions the following overarching research question is formulated:

*How does the governmental imposed institutional environment influence the engagement in entrepreneurship of women in comparison with men?*

This research is important from a societal point of view. As has been previously mentioned, women fall behind on plenty of aspects in society. In today's day and age in developed countries, gender is no valid reason to segregate groups from success. Overall, businesses ran by females are generally very contributive to economic wealth or innovation and create more potential in the development of society in comparison to businesses ran by males (Dheer et al., 2019; Minnitmi, 2009). Since female businesses are very contributive to the economic wellbeing, minimizing the gender gap can thus lead to improved economic conditions, but will also improve equality between genders (Dheer et al., 2019). Being aware of the main determinants that can help to close the gender gap, influenced by the government, is very important. When governments are aware of their potential contribution via institutions to engage more women in entrepreneurship, they can use institutions as a tool in their attempt to increase equality and decrease the gender gap. This information can also be used by institutions or academics in their attempt to design supporting programs for women in entrepreneurship. If the government is aware of the determinants that can contribute to female success, they can help in closing the gender gap.

In the existing literature about the institutional impact on entrepreneurial activity the effect of the governmental institutions is often discard potential gender differences. Governmental institutions are expected to be an important determinant of entrepreneurial activity. The paper by Chowdhury et al. (2018) finds significant negative effects for institutions such as tax regulations, governmental stability measured in corruption, and government size on business ownership rates. For the availability of credit, they find a positive and significant relationship, which all suggests the importance of the effect of governmental institutions on entrepreneurial activity.

However, another strand of literature on the gender gap in entrepreneurship depicts that for men and women, entrepreneurial activity is different. It is not only that women are less often engaged in entrepreneurship (Mueller, 2004). It is also the case that they face different

environmental conditions, such as more difficulty in obtaining credit or the negative stereotypes and perceptions of women engaging in entrepreneurship (Blair & Lichter, 1991; Goel, 2018). It suggests that external factors, such as governmental institutions, can have a differing effect for men and women. To address the gap in the literature, I combine research concerning the effect of the institutional environment on entrepreneurial activity with research on the gender gap in entrepreneurship.

Women in different countries experience different institutional environments, which can have a different effect on their entrepreneurial activity. For example, research on the Chinese institutional environment for women by Wang et al. (2019) suggests that the Chinese institutional environment encourages less women into entrepreneurship. This is due to the political ties that are needed in China to be successful. Women are less likely to have such political ties. Farooq et al. (2019) find that in India women perceive informal competition as a large obstacle in regions with weak institutions when engaging in entrepreneurship as in comparison with men. It indicates the differential effect of the institutional environment for female entrepreneurs on their entrepreneurial activity. Another study has found that governmental imposed learning programs, which decreases entrance barriers among Hindu women, increases their entrepreneurial activity (Field et al., 2010). All of the studies mentioned above focus on the institutional effect of female entrepreneurship, unique to specific countries. Yet, they do not portray a more general image of the institutional effect across countries.

The other strand of research is focused specifically on the effect of female friendly institutions on entrepreneurial activity. Research by Thébaud (2015) finds a negative and significant effect of female friendly institutions such as generous child care subsidies and paid maternity leave on female entrepreneurial engagement. The result is conducted from a sample of 55 countries and 475,000 individual observations over 5 years.

By looking at a variety of different institutions among a sample of multiple countries I attempt to provide a comprehensive assessment of the relationship between governmental institutions, the gender gap and entrepreneurial activity. Estimating this relationship can help governments to estimate the economic and entrepreneurial impact of their institutional environment. By conducting cross-country analysis, I try to bring insights into global trends of the effects of institutions on the gender gap instead of identifying a very country specific relationship.

In this thesis, I investigate the research question by analyzing data on the individual level collected by the Global Entrepreneurship Monitor in 2017 for 118,795 individuals, and on the country level for 50 countries collected from The World Data Bank, Transparency International and the Global Entrepreneurship Monitor. These two dimensions are combined by using a

multilevel logistic regression. With the multilevel model I test the hypotheses that are constructed using literature that indicates entrepreneurship as a process of value creation (Bruyat & Julien, 2001). To establish the hypotheses, I combine literature that explains the fundamentals of the gender gap in entrepreneurship with literature on governmental institutions such as government size, education, regulatory burden, government stability, income regulations and government support policies and their effect on entrepreneurial activity. I address the research question by estimating the coefficient of the interaction term of the governmental institution and gender on the entrepreneurial activity rate.

The results obtained from the multilevel logistic regression find support for the expected negative relationship of gender with entrepreneurial activity. The result indicates that women are less likely to be engaged in entrepreneurship compared to men. Additionally, a larger government size is expected to have a stronger negative effect on the engagement in entrepreneurial activity for women compared to men. The negative effect supports the findings from the literature and accepts the hypothesis which also states that a large sized government has a more negative effect on entrepreneurial engagement for women than for men. The interaction effects of education, income regulation and government support policies give an insignificant effect for females on entrepreneurial activity. This insignificant effect means that the coefficient of those governmental institutions cannot be estimated precisely, thus one cannot interpret the coefficients. A higher regulatory burden is found to have an attenuated negative effect for women on their entrepreneurial activity in comparison to men. The weakened effect means that women are more positively stimulated to engage in entrepreneurial activity when the regulatory burden increases, in comparison to men. Additionally, the suspected positive effect of higher governmental stability on entrepreneurship is weakened for women in comparison with men. This relationship indicates that stable governments lead to a lower degree of entrepreneurial engagement for women than for men. This all suggests that the remaining hypotheses that indicate the interaction effects of governmental institutions and gender are not supported by the estimations of the model. Therefore, these results are contrary to statements in the literature.

This paper has the following structure: Section 2 presents a literature review of the important determinants of entrepreneurship and how these relate to the gender gap in entrepreneurship. Additionally, literature about the effect of governmental institutions on entrepreneurship is described together with the motivation of the hypotheses. In the third section the data are described as well as the methodology that is used to answer the research question. The fourth section displays and explains the results of the regression and the robustness checks. The



fifth and last section concludes the findings and discusses the research altogether with the limitations and implications for practice. Also, suggestions for further research are given.

## 2. Literature review and hypotheses building

### 2.1 Background

#### 2.1.1 Entrepreneurship

Entrepreneurship knows various definitions. According to research by Gartner (1990) entrepreneurship is related to starting new ventures, owning a business and creating value from opportunities. Diandra and Azmy (2020) suggest that entrepreneurship is an important part of the business life which will add to a successful and healthy organization. Stevenson (1983) focusses more on the recognition of entrepreneurship by defining it as “The pursuit of opportunity beyond the tangible resources that you currently control”. As stated by Bruyat and Julien (2001) entrepreneurship exists of value creation. The entrepreneur is able to form a certain situation in its environment and use its capabilities and new and existing resources to create value.

This value can be in money or immaterial values. To define entrepreneurship, it is important to look at the development of one’s skills in order to find entrepreneurial behavior (Kobia & Sikalieh, 2010). These differing definitions result in fragmentary research and different interpretations of the definition of entrepreneurship (Anderson & Starnawska, 2008). To avoid fragmentation, in this research the definition of Bruyat and Julien (2001) is used to define entrepreneurship. The definition does not provide a narrow view, which is beneficial since the execution of entrepreneurship can vary per situation (Naudé, 2013). It leaves room for different interpretation that is suitable for different circumstances in which entrepreneurship can take place.

Although it is hard to define entrepreneurship, drivers of entrepreneurship are more clearly classified. Key drivers of entrepreneurship are the personality characteristics and traits of the entrepreneur (Allport & Allport, 1921; Baum et al., 2014; Littunen, 2000). Findings by various researchers suggest that personality traits such as openness, conscientiousness, extraversion, agreeableness, neuroticism optimism, overconfidence need for achievement, collectivism, innovativeness and creativity positively influence entrepreneurial intentions (Bazkiaei et al., 2020; Biraglia and Kadile, 2017; Hao Zhao et al., 2010; Leutner et al., 2014; Mueller & Thomas, 2001; Obschonka et al., 2012; Trevelyan, 2008; Zeffane, 2013).

There is criticism on the personality approach of entrepreneurship. Baum et al. (2014) suggest that it is too difficult to relate such various behavior and personality traits to entrepreneurship in a single approach since they are supposable not strong enough to all affect entrepreneurship in a similar way.

Next to psychological and personal factors, there are also environmental factors that can lead to entrepreneurship. Environmental factors can push a person into entrepreneurship through negative situational factors. These environmental factors can for instance create dissatisfaction about either one's current work situation, the institutional context one is present in or the loss of employment (Gilad & Levine, 1986). These entrepreneurs that are pushed into entrepreneurship are more often necessity entrepreneurs than opportunity entrepreneurs (Williams, 2009). Entrepreneurs can also be pulled into entrepreneurship by an environment that hands them business opportunities. These opportunities can be used to ease the engagement into entrepreneurship or to work out their business ideas. People can also be induced into entrepreneurship by the fact that they prefer to experience independency from being an entrepreneur, instead of the dependency of working in employment (Amit & Muller, 1995; Gilad & Levine, 1986).

### **2.1.2 Entrepreneurship and the gender gap**

Entrepreneurship is not the same for men and women. There is a long-standing issue of gender differences in entrepreneurship where the literature shows that there are more men who are engaged in entrepreneurship compared to women (Mueller, 2004). In a sample of 300,000 individuals over 41 countries Baughn et al. (2006) find that the number of men engaged in entrepreneurial activity is three times higher than the number of women that engage in entrepreneurial activity. Overall, men think more about starting a business and engaging in entrepreneurship compared to women (Díaz-García & Jiménez-Moreno, 2010; Koellinger et al., 2013; Shinnar et al., 2018). Females also seem to act less often on their entrepreneurial intentions in comparison to males (Santos et al., 2016). This makes us able to explain part of the gender gap since having entrepreneurial intentions can positively affect the chance of actually undertaking steps and engaging in entrepreneurial behavior (Kautonen et al., 2015).

The gender gap in both entrepreneurial intentions and activity is perceived to be problematic for the process of improvement of gender equality and can be explained by various theories related among others: gender stereotyping, differing personal characteristics and external inequality factors.

Generally, gender stereotyping is known to increase the gender gap in entrepreneurship. Gender stereotyping entails that there are certain beliefs and expectations that put genders into general characteristics and groups (Ellemers, 2018). Under these gender stereotypes, men are perceived to be the main working force and the breadwinners, they are supposed to be able to support their families. If not, they are not considered a successful man; this image has been prevalent for centuries. Nowadays these perceptions are not as strong anymore, but they are imprinted on the main division of tasks (Engle, 1997; Thébaud, 2010).

On the other side, plenty of women are expected to be the caregiver of their children and do most of the housework. It leaves them to less opportunities and time to engage in entrepreneurship, have entrepreneurial intentions or even have a fulltime job (Blair & Lichter, 1991). Entrepreneurship is seen as non-compliable with these expectations (Baughn et al., 2006). DeMartino and Barbato (2003) find that the gender gap in career motivation increases when females are married and have younger children that are highly dependent on them. The gender gap is decreasing by the introduction of new technologies. These technologies make it overall easier for women to start and lead their own business, whether or not online, regardless of the existing stereotypes (Ughetto et al., 2020).

These embedded stereotypes led women into thinking that they are not as suited for entrepreneurship as men. Overall, women are less likely to see themselves as an entrepreneur or they think they do not have the capabilities to be one. Women also feel like they are not precepted to engage in entrepreneurship since society is generally more supportive to men starting up a business (Santos et al., 2016). This all leads to women being less engaged in entrepreneurship and makes them less likely to start a business (Thébaud, 2010).

Additionally, different personality traits and entrepreneurial intentions among men and women can impact their differing engagement in entrepreneurship. Characteristics that are achievement orientated, incline to take charge, reflect autonomy and rationality are most often linked to men (Heilman, 2012). These characteristics are suggested to be more prone for entrepreneurship compared to the characteristics linked to women. Women are more often linked to characteristics that have emotional sensitivity, deference, affiliative tendencies and concern for others (Heilman, 2012).

Taking risks and being a leader are mostly male-dominant traits (Bird & Brush, 2002). When becoming an entrepreneur there are large risks involved. Hence why risk aversion is seen as a trait that contributes negatively to the success of a business start-up or any entrepreneurial activity (Kan & Tsai, 2006). Having no risk aversion is an important trait since new businesses and corporations are mostly conducted in very uncertain conditions where risk aversity will not improve performance. Women are much more risk averse which can negatively influence their decision to engage in entrepreneurship, and if they do, their successes (Akehurst et al., 2012). This puts women into the position to think that they are less suitable for a career as an entrepreneur (Bird & Brush, 2002). It discourages them to set up a business which will maintain the gender gap in entrepreneurship (Obschonka et al., 2014).

Women are also less competitive and are less likely to engage in a competitive environment as compared to men (Bönte & Piegeler, 2013). Being more competitive is seen as an important indicator of having entrepreneurial intentions and a determinant of successful entrepreneurial behavior (Neneh, 2019). Having more masculine personality traits or behavior

is seen as a norm to succeed within the field of entrepreneurship and the typical female personalities are perceived as a negative factor (Balachandra et al., 2019). But as women have more experience in entrepreneurship and have learned the ropes, their behavior becomes more similar to those of men and differences in entrepreneurship seem to fade (Ahl, 2006).

But, not all male-prone characteristics are considered to be an advantage in entrepreneurship. For women, creativity is a more common personality trait compared to men (Stoltzfus et al., 2011). Creativity is an important determinant of having entrepreneurial intentions and interfering in entrepreneurial activity. People with a high self-perception of creativity or that are stimulated to think creative have a higher level of entrepreneurial intentions (Zampetakis & Moustakis, 2006). According to Smith et al. (2016) creativity is significantly of higher importance for woman and their entrepreneurial intentions in comparison to men. The importance of creativity leads to thinking that not all personality traits and characteristics that are male dominant are prone to engage in entrepreneurship since some perceived female behavior can also have a positive effect. Additionally, it is suspected that female entrepreneurship is not driven from their personal characteristics and traits but by their tendency to get 'organized'. This is overall a less dominating attitude (Maes et al., 2014).

Not all agree that personality traits and characteristics are the main reason for differing entrepreneurial intentions among men and women. Maes et al. (2014) suggest that personality traits and characteristics are only mediators of the effect of gender on entrepreneurial intentions. Women experience other difficulties such as unequal treatment that make it harder for them to become an entrepreneur. Overall, female entrepreneurs experience more difficulty in obtaining venture capital compared to male entrepreneurs (Guzman & Kacperczyk, 2019). To be able to finance their entrepreneurship, women are more dependent on funds of family, friends and acquaintances. They experience a more difficult time obtaining external funds which can influence the success of their business. This leads plenty of women to utilize their savings when starting up a business. It is imposed that using savings instead of external funding can increase business failure (Storey, 1994). The financial deficit at the start of their business can impose problems for the future success of women in entrepreneurship (Tur-Porcar et al., 2017). If the large inequality is also perceived by women, it will accelerate the increase the gender gap since they will feel less motivated to engage in entrepreneurship. Policies that could change the inequality in obtaining financial funds could help to decrease the inequality and the cultural barriers that have been formed (Ilie et al., 2021).

Miranda et al. (2017) find that the lower engagement of females has nothing to do with their lack of determinants to be a successful entrepreneur. Women's' lower engagement is caused by the existence of implicit barriers that withhold women from starting a business, or

to undertake entrepreneurial behavior. According to Sweida and Reichard (2013) reducing the barriers that come with masculine view of entrepreneurship could lead to more women being interested in starting a business, and thus having overall higher entrepreneurial intentions. Another explanation of the gender gap in entrepreneurship and entrepreneurial intentions could be due to the stimulation of family members or friends that engage in entrepreneurship as well. Findings suggest that role models can positively influence the entrepreneurial intentions of females (Wannamakok & Chang, 2020). But the effect is most prevalent when this peer has the same gender. The importance of role models can lead to more men engaging in entrepreneurship since they are more likely to be surrounded by other male entrepreneurs (Markussen & Røed, 2017). However, these formal factors such as family context seem to be less important for females when engaging in entrepreneurship. Women are mostly driven by informal factors such as recognition, but also female networks contribute to their entrepreneurial engagement (Noguera et al., 2015).

### **2.1.3 Entrepreneurship and institutions**

Entrepreneurship and entrepreneurial intentions are formed differently among different nations (Giacomin et al., 2011). These differences can be attributed to the different entrepreneurial and economic circumstances that exists among different countries (Bergmann & Stephan, 2013). Part of these cross-nation differences lie in the institutional context that is embedded in each nation.

As described by Hodgson (2006), institutions are a structure of both established and prevalent rules that are utilized to structure interactions. In other words, institutions are used to formalize the normative, regulatory and cognitive institutions in which people act (Baughn et al., 2006; Goguen & Roşu, 2002). On one hand, institutions are seen in a normative context which concentrates on the religion and one's belief that shape the society together with their cultural values. On the other hand, in a cognitive context there is focused on diffusion through the country of these institutions by for instance education or technology (Baughn et al., 2006).

The literature proposes that the institutional environment that is imposed by the government is generally connected to a country's economic performance and its formal and informal entrepreneurial activity (Yay et al., 2018). Institutional quality and quantity are expected to play an important role for the entrepreneurial activity in a country (Mohammadi Khyareh, 2017). The relationship is supposable very dynamic and different among various institutions and countries in different development stages (Amorós, 2011; Chowdhury et al., 2018). Governments can use institutions to promote entrepreneurship by creating a friendly entrepreneurial environment. Promoting entrepreneurship can be done through favorable regulations and legislations for entrepreneurs such as introducing risk-reducing bankruptcy laws (Lee et al., 2011; Stephen et al., 2005).

Important institutions that are expected to be determinants of entrepreneurship are for instance education, government size, business regulations, governmental stability, income regulations and government support policies<sup>2</sup> (Chowdhury et al., 2015; Darnihamedani et al., 2018; Dutta & Sobel, 2016; Hasan et al., 2017; Parker, 2007; Sternberg, 2014).

The effect that governmental-institutions have on the entrepreneurial environment also depends on whether or not informal institutions are of great importance. Informal institutions are non-written rules, norms and values that exist parallel to formal institutions (Voigt, 2018). Formal institutions are 'hard' institutions, implemented officially by the government such as laws and regulations. Compliance to these institutions can be checked (Rodríguez-Pose, 2013). According to Puffer et al. (2010) in countries such as Russia and China there is a higher dependency on informal institutions which makes the effect of formal institutions on entrepreneurship different. When formal and informal institutions are not aligned, it can cause difficulties in the entrepreneurial environment (Williams & Vorley, 2014).

The effect of institutions can also be mediated by factors such as high investment risks and availability of funding (Barinova et al., 2018; Mohammadi Khyareh, 2017).

It is not only that entrepreneurship is shaped by institutions. On their turn entrepreneurs can also influence institutions themselves. By trying to avoid the regulations and taxes imposed by the government, on one hand entrepreneurs limit their impact but on the other hand stimulate them to improve (Henrekson & Sanandaji, 2011).

#### **2.1.4 Effect of institutions on female entrepreneurship**

Since it is perceived that entrepreneurship and entrepreneurial intentions are very different among men and women it is natural to expect that they react differently to governmental-imposed institutions (Bárcena-Martín et al., 2021).

There are some important institutional determinants that will affect the different engagement. Estrin and Mickiewicz (2011) and Thébaud (2015) find that improved work-family regulations such as maternity leave and child-care availability affect female entrepreneurship more negatively compared to male entrepreneurship. An explanation for this is that it is only possible for women to obtain these favorable regulations when they are in employment. Favorable regulations in employment will make them more likely to opt out of entrepreneurship because in that case they will not receive these benefits.

Regulations and institutions can be seen as an important tool to redistribute resources that are proven to be unequally distributed among genders (Chowdhury & Audretsch, 2014). When institutions, such as entry barriers or access to funding, which can impose barriers for females starting up a business, are lifted or eased, it can result in higher entry rates of females

---

<sup>2</sup> These institutions are further discussed in the hypothesis development section

in entrepreneurship. Empirical evidence from Portugal shows that lifting these barriers leads to even more females entering business in comparison to men (Castellaneta et al., 2020). Governments can form the institutional environment to be supportive for women in entrepreneurship. Nudging women into entrepreneurship can be done through improving their access to funding, increasing the quality of business regulations and improving the labor market regulations (Boudreaux & Nikolaev, 2018).

Other institutions and institutional perspectives that are expected to influence female entrepreneurship are for instance education, government size, business regulations, governmental stability, income regulations and government support policies<sup>3</sup> (Brieger & Gielnik, 2021; Gawel, 2021; Iakovleva et al., 2013; Jennings & Brush, 2013; Kobeissi, 2010).

## 2.2 Literature and hypothesis building

### 2.2.1 Women engaging in entrepreneurship

Taking all the literature that is discussed above into account, it is in line to expect that there is a substantial gender gap in entrepreneurship for men and women.

Having recognized all these factors such as favoritism of masculine personality traits, negative gender stereotyping for women together with their difficulty to obtain financial funding as disadvantages for females in entrepreneurship, it can be suspected that all these factors will induce a more negative effect on women when deciding to engage in entrepreneurship in comparison to men.

**Hypothesis 1:** Women are less often engaged in entrepreneurial activity as compared to men.

### 2.2.2 Government size

Having a government of a large size is often related to the image of a government that is tightly engaged with all aspects of its citizens lives. A large government most likely has high taxes and a large public sector (Madrack, 2010).

Such a large and cumbersome institute decreases entrepreneurial initiative (Sudbury, 2005). A larger sized government is overall related to a negative effect on entrepreneurial activity. Larger governments more often have safety nets and favorable regulations for people in employment. Such regulations can discourage potential entrepreneurs in engaging in entrepreneurial activity (Bosma et al., 2018). This view is supported by Estrin et al. (2013) who also find that the government size negatively affects the presence of start-ups. The effect seems to be stronger for commercially focused entrepreneurs compared to social focused

---

<sup>3</sup> These institutions are further discussed in the hypothesis development section

entrepreneurs. This decrease is related to the financial benefits and a stable work environment large sized governments often provide when you enroll in employment. Individuals that are engaged in commercial entrepreneurship value the financial benefits higher compared to individual engaged in social entrepreneurship (Estrin et al., 2013). A large sized government could however lead to inefficiency of policies and can introduce overreach in public administration. Additionally, large governments can introduce more regulations that need to be complied to when starting a business. It creates a discouraging environment for entrepreneurs (Audretsch et al., 2021; Parker, 2007). Researchers do not only suspect a negative relationship between government size and entrepreneurial engagement. Aidis et al. (2012) argue that large governments can account for more protective institutions such as property rights or can eliminate corruption which can nudge prospective entrepreneurs into entrepreneurship by decreasing such entry barriers. However, they do find from a sample across 47 countries worldwide that large governments decrease overall start-up activity in entrepreneurship, which complies with the general negative trend that is proposed in the literature.

Women run into more difficulties when starting to engage in entrepreneurship, which is due to their disadvantage in obtaining financial funds and having less managerial experience in comparison to men (Heilbrunn, 2016). Having a large government on stand by to provide aid can be helpful, however it can discourage women from engaging in entrepreneurship. Since entrepreneurship brings more insecurity, especially on a financial level, for women than for men, the facilities that are provided in employment by a large government that provide stability and job security are more favorable for female employees (Hisrich, 1986). Stability and job security will decrease the urgency for necessity-based entrepreneurs, which for women is an important way out of unemployment (Minniti & Arenius, 2003). This all implies that a large government provides such favorable conditions for female employees that they are less likely, in comparison to men, to engage in entrepreneurship.

**Hypothesis 2:** The size of the government has a negative effect on entrepreneurship, and this effect is larger for women as compared to men.

### **2.2.3 Education**

As stated by Friedman (1955) governments are responsible for the organization of general level education for citizens. Advanced education should be at one's own initiative. Such a view is not representable anymore. Nowadays governments are highly engaged in organizing the education system. It is not only because it is important for the intellectual development of their inhabitants, but also to make it, and keep it assessable to all in society (Poterba, 1996). The view of governmental responsibility in education differs between countries or even states



depending on their development (Deger, 1985). Increased governmental spending is often linked to a higher educational quality and accessibility (Henry, 2013; Mok, 2005).

Education is often also considered to be an important determinant of entering the entrepreneurial field (successfully). Countries with highly educated residents have more successful, productive and better earning entrepreneurs (Millán et al., 2014). This finding is supported by Levine and Rubinstein (2017) and Hunady et al. (2018) who both suggest that people who have a higher education or score well on aptitude tests when they were teenagers, engage in more and eventually better in entrepreneurial activities. Institutes of higher education are also perceived to have a good and supporting entrepreneurial climate. That effect also depends on one's peers. If one is surrounded by fellow students who are engaged in entrepreneurship (courses), it can positively influence their own entrepreneurial undertake (Bergmann et al., 2018).

Entrepreneurial education is specifically targeted at learning about how to become a successful entrepreneur (Higgins & Elliott, 2011). In general, these programs are found to be successful in order to develop entrepreneurial skills and intentions (Remeikiene et al., 2013; Sánchez, 2013; Taatila, 2010). Entrepreneurial education also seems to show a positive and significant effect on actual entrepreneurial development (Hasan et al., 2017). Thus, investing in education and its quality can be beneficial to the entrepreneurial activity of a country. However, some findings suggest that entrepreneurial education does not always give the expected effect. According to Oosterbeek et al. (2010) entrepreneurial education does not improve favorable skills and intentions to become an entrepreneur. This is because the information that is obtained during entrepreneurial education can give a more realistic view of entrepreneurship and can discourage prospective entrepreneurs.

For women the access to education is not normalized in all countries. Due to the perceived gender stereotypes, it is not always seen as a necessity for women to get educated. There is an overall lower enrollment of women in education in comparison to men. The gender gap is larger in developing countries compared to developed countries (Lincove, 2008). Higher education among females suggests higher enrolment in entrepreneurship (Ahmed et al., 2017; Kobeissi, 2010). Which is also the case for the enrollment in entrepreneurial education (Westhead & Solesvik, 2015). An increase is often due to the enlarged contact, information and connections with successful entrepreneurs women can obtain during their educational period (Taniguchi, 2002). Education is also an important determinant of being granted a loan to set up a business, which is beneficial for women since they have difficulties in obtaining financial funds (McKernan, 2002; Parker & van Praag, 2012).

Overall, women are more likely to participate in entrepreneurial activities and will yield better results when their education level is high (Gawel, 2021; Sowmya et al., 2010). Increased training or education will contribute to the closing of the gender gap since it is perceived that

women may benefit more from additional knowledge when they start in entrepreneurship compared to men (Piva & Rovelli, 2021). It is generally because men can rely more on their networks and status when starting in entrepreneurship in comparison to women. Women are more reliant on their capabilities, which they can obtain through education (Llusa, 2010).

**Hypothesis 3:** Educational investments have a larger positive effect on the entrepreneurial activity for woman as compared to men.

#### **2.2.4 Regulatory business environment**

When individuals decide to engage in entrepreneurship, setting up a business comes with a large number of formalities and regulations that need to be considered. According to Henrekson and Stenkula (2010) and Viviano (2008) entry regulations are rules that are implemented in order to limit new firm entrance, to regulate the labor market and to propose growth barriers. They often come in the form of registration fees, permits or licenses (Chambers et al., 2019). These regulations are overall seen as entry barriers when starting in entrepreneurship. This is since these regulations can take a lot of time to complete, and can be very costly (Klapper et al., 2006). An advantage of entry regulations is that governments can protect incumbent firms from new entrants who can eliminate their competitive advantage in the market (Porter, 1980).

As was mentioned previously, the regulatory environment is also seen as very costly. These costs that come with the entry regulations for entrepreneurs will negatively influence the growth of new firms (Chowdhury et al., 2015; Levie & Autio, 2011). The effect even holds when there is controlled for other entrepreneurial environmentally friendly characteristics (Klapper et al., 2006). Additionally, the presence of many entry regulations can stimulate the growth of the informal sector in a country (Chen & Alter, 2012; Kus, 2010). Reducing entry barriers is not always beneficial for entrepreneurs. It is also suggested that a reduction will result in increased entry of low-quality entrepreneurs compared to entrepreneurs that have high growth potential. It is suspected because the entry regulations create a natural selection of qualified individuals (Acs & Szerb, 2006).

Entry regulations can introduce inequality. Chambers et al. (2019) find that when nations increase the number of procedures required to start a business, it enlarges the income inequality. For women, the effect is similar. Women are overall less likely to act out on their entrepreneurial intentions to start their own business (Santos et al., 2016). It is proposed that when entry barriers are removed, women will engage more in entrepreneurship and will launch businesses at higher rates than men (Castellaneta et al., 2020). Since women already face more difficulties when starting to engage in entrepreneurship, they will react more strongly to these barriers being released since it will lead to lower costs and easier entrance to the market

(Jennings & Brush, 2013). Female business operations are mostly concentrated in low capital-intensive industries since they struggle with finding funding to pay for the process of starting up the business. Reducing entry barriers leaves more credit to invest in their actual business (Klapper & Parker, 2011). This all suggests that increasing business regulations creates a higher disadvantage for women when starting up a business.

**Hypothesis 4:** An increasing regulatory burden, such as the number of start-up procedures, have a negatively effect on entrepreneurial activity, and this effect is more negative for women as compared to men.

### **2.2.5 Governmental stability**

For an entrepreneur the environmental circumstances and conditions of operation are of high importance. Next to the competition and the market in general, the government has a large share in modelling these conditions. Governmental or political stability is often indicated as an absence of violence, governmental longevity, a stable constitutional order, no structural changes in organization and a multifaced societal attribute (Dowding & Kimber, 1983). The governmental stability is most often influenced by the international context of a nation (Xiaopeng & Pheng, 2013).

Nations that are associated with high rates and quality of entrepreneurship are often perceived as stable (Bernier & Hafsi, 2007). Stability is an indicator of their connectivity. According to Chambers and Munemo (2019) political stability will positively influence entrepreneurial undertake. Reasoning behind this is that entrepreneurship is very uncertain, and a stable environment will reduce part of the uncertainty. Reduction of the uncertainty makes entrepreneurship a more attractive option. This view is supported by Dutta et al. (2013). They suggest that the extra transaction costs, contract enforcement and the lack of protection that come with governmental and political instability can distort entrepreneurs from their practices. Developing nations also experience reduced entrepreneurial activity in political unstable environments. Between these developing nations not all react the same. In a continent such as Africa, political stability is much more important for the entrepreneurial activity and quality compared to other developing nations (Munemo, 2012).

In order to measure governmental stability, researchers often use the degree of corruption as a determination. Corruption is an indicator of governmental instability and bureaucracy since it is embedded in the social norms of a culture (Graf Lambsdorff, 2003; Murphy et al., 1993). It is perceived to be an important determinant of the quality of the structure of governmental institutions (Shleifer & Vishny, 1993). Corruption is mostly large in governments that are instable since political stability is considered its prevalence (Zhao & Xu, 2015). Corruption increases uncertainty and decreases transparency which can introduce

unnecessary costs for entrepreneurs (Chowdhury et al., 2019). Like governmental instability, corruption also decreases the entrepreneurial activity in a country and will under no circumstances improve the entrepreneurial environment (Dutta & Sobel, 2016). The entrepreneurial activity in corruptive environments is also perceived to be less productive (Avnimelech et al., 2014).

Governmental instability and corruption are suspected to have a greater negative impact on women compared to men. According to Chowdhury and Audretsch (2014) corruption negatively impacts female entrepreneurial activity. They advocate that since women face more difficulties when collecting funding in corruptive environments compared to men, women are more likely to opt out of entrepreneurship. Additionally, women have less managerial experience in comparison with men, thus are less likely to know how to deal with corruption. This all discourages them from engaging in entrepreneurship (Statnik et al., 2022). All in all, since a woman's dependence on the governmental stability is higher, governmental instability will more negatively affect their entrepreneurial activity (Estrin & Mickiewicz, 2011).

**Hypothesis 5:** Governmental stability has a positive effect on entrepreneurial activity, this effect is stronger for women as compared to men.

### **2.2.6 Income regulations**

Taxes and income regulations are institutions that are imposed by the government. Taxes lower the return of the income earned. Such regulations are designed in order to manage income distribution and the collected taxes are used to organize governmental agencies and spending on healthcare, education, defense, infrastructure urban planning etc. Income taxes create the incentive to avoid earning taxable income (Poulson & Kaplan, 2008). Such incentives makes it hard for governments to design a tax structure that on one hand collects enough funding, and on the other hand does not discourage people from practicing entrepreneurial activities (Lee & Gordon, 2005).

Income regulations, or taxes, can also impose an effect on entrepreneurs, entrepreneurial intentions and investments. When entrepreneurs gain profits from their activities, they have to pay taxes over this amount. When taxes on personal income and income from business activities are raised, this will impose a negative effect on the entrepreneurial and corporate investment (Bradford DeLong et al., 2010). It is suspected that the reduction is related to the fact that when income is deducted by taxes, the lower return received decreases the incentive to engage in entrepreneurship. Particularly for risk-taking entrepreneurs, these recurring costs decrease their incentive to engage in entrepreneurship (Darnihamedani et al., 2018). The effect of taxes on entrepreneurial engagement also depends on the characteristics of the entrepreneur. Entrepreneurs that are more progressive are less

likely to enroll in self-employment when tax rates are high. They overall experience higher opportunity costs of entrepreneurship (Wen & Gordon, 2014). For entrepreneurs there are generally more opportunities to avoid taxes compared to people in employment. Entrepreneurs are overall more in touch with their earnings and perceive taxes as a higher loss (Kamleitner et al., 2012; Thaler, 1999). This creates a higher incentive to avoid taxes. Overall, taxes are seen as barrier for formal entrepreneurship of high quality, which is a loss for the quality of the business climate (Venâncio et al., 2022).

The described negative effect of taxes is prevalent for women in entrepreneurship (Goel, 2018). Taxes create an additional financial barrier, thus increase the inaccessibility of entrepreneurship. Since women already obtain more difficulty when obtaining credit for their business, it is implied that the negative effect of taxes on entrepreneurial activity is even larger for women (Brieger & Gielnik, 2021; Goel, 2018). The fact that women already start with less financial means compared to men makes an additional financial burden, such as taxes, a larger discouragement into entrepreneurial activities due to lower returns.

**Hypothesis 6:** Increased taxes have a negative effect on entrepreneurial activity and this effect is more negative for women as compared to men

### **2.2.7 Government support policies**

To increase the quality of the conditions entrepreneurs operate in, governments can impose policies and regulations that support people who want to engage in entrepreneurial activities. These support policies can be implemented to encourage all entrepreneurs to start up their own business (Ribeiro-Soriano & Galindo-Martín, 2012). Such policies can affect the supply and demand side of entrepreneurship. (Verheul et al., 2002). An often-used support method by the government is mentoring and advising. These mentors or advisors are beneficial in teaching new entrepreneurs' cognitive skills which can improve their performance in entrepreneurial activity. Such support can additionally improve innovativeness of the newly set-up businesses (Audet & Couteret, 2012; Buffart et al., 2020; St-Jean & Audet, 2012). Financial funding is also used as a support measure by the government (Lee, 2019; Obaji, 2014). The extent to which governmental support impacts entrepreneurial activity is arguable. Overall, it is suggested that governmental support policies have a positive effect on entrepreneurial activity in both developed and developing countries (Chowdhury et al., 2018). However, according to (Sternberg, 2014) the regional context is of higher importance than the received governmental support.

Some support policies are specifically designed to attract minorities, such as women, into entrepreneurship (Iakovleva et al., 2013). Findings suggest that women need more support when setting up a business compared to men (Hisrich, 1986). Successful examples of

governmental support initiatives are entrepreneurial programs for women in Malaysia and Indonesia (Abdul Mutalib et al., 2019; Hendratmi & Sukmaningrum, 2018). Most support programs are focused on financial support and guidance in the process of becoming an entrepreneur (Welter, 2004). These programs are perceived to be successful for women since women obtain more difficulty in obtaining financial and moral support (Powell & Eddleston, 2013; Vossenber, 2013).

However, support policies that are very gender specific, such as accessible child-care or prolonged maternity leave impose a negative effect on the female enrollment in entrepreneurship (Estrin & Mickiewicz, 2011; Thébaud, 2015; Welter, 2004). These regulations make working in employment more attractive compared to self-employment since the entrepreneur will not receive these benefits when they are self-employed. It is argued if introducing government support policies benefits the quality of entrepreneurial activity. The barriers that are prevalent are perceived as a natural selection for high quality entrepreneurship (Acs & Szerb, 2006). Overall it is suggested that since women experience a harder time when trying to engage in entrepreneurship, government support policies will increase their entrepreneurial engagement more in comparison to men.

**Hypothesis 7:** The presence of governmental support policies has a positive effect on entrepreneurial activity and this effect is more positive for women as compared to men.

### 3. Data and methodology

In this section I describe the data and methods used in this paper. These data and methods allow to investigate the research question. I use data for entrepreneurial activity and gender at individual level, and data for governmental institutions at country level to examine the moderating relationship with entrepreneurial activity. Consequently, a multilevel logistic regression is performed with random varying slopes and intercepts.

#### 3.1 Data sources

The data originates from three different resources. The individual-level data to measure the entrepreneurial activity, gender and individual control variables are from the General Entrepreneurship Monitor (GEM) Adult Population Survey (APS) from the year of 2017. The survey interrogates over 1000 individuals per country per year. In the year of 2017 118,795 individuals from 50 countries were examined which are listed in Appendix A (GEM, 2017). The survey collects information on the demographic characteristics of the individual, such as age and education level. It also gives insights on the motivation or ambition to start a business and how the individual experiences the business opportunities in their surroundings. I use data

from The World Bank from 2017 to collect the indicators that measure the institutional environment such as education spending, regulatory burden, government size and tax regulations (The World Data Bank, 2017). Also, the country-level control variables are collected from this data source. The World Data bank is an open database that has data on countless topics on country level. The data originates directly from statistical offices of the relevant country (The World Data Bank, 2022). The measurement of corruption is retrieved from country-level data from Transparency International and the measure of government support policies originates from the GEM nation level survey (Transparency International, 2017).

## 3.2 Variables

### 3.2.1. Individual level data

#### 3.2.1.1. *Dependent variable*

To measure the moderating effect of governmental institutions on entrepreneurial activity of women I use the *TEA* rate as the dependent variable. This variable measures whether someone is engaged in entrepreneurial activity. It is a binary variable that equals “1” if the individual is engaged in entrepreneurial activity or “0” if not.

The measure of TEA is overall considered by researchers as a good measurement of entrepreneurial activity, especially in institutional literature (Ahmad & Seymour, 2008). The index represents the two early-stages of entrepreneurship: nascent entrepreneurship or being an owner-manager of a new business (GEM, 2017).

#### 3.2.1.2. *Independent variable at the individual level*

In order to depict the difference between the effect of institutions on women in comparison to men a binary independent variable called *gender* is introduced. This binary holds either “1” if the respondent classifies themselves as female or “0” if the respondent classifies themselves as male. Respondents that have filled in “*don’t know*” or “*refused*” as their gender orientation are deleted from the sample.

#### 3.2.1.3. *Control variables at the individual level*

Control variables at the individual-level and the country-level account for individual characteristics that can influence the dependent variable. A detailed overview and description of all control variables used on both the individual as the country-level are presented in Table 4 Appendix B. The control variables I use follow similar studies on the same subject, or the same methods, i.e. multilevel regression analysis (Chowdhury et al., 2018; Estrin & Mickiewicz, 2011).

The control variables at the individual level allow me to control for differences of demographic characteristics. I expect all control variables to be related to the entrepreneurial activity of an individual. The control variables are in line with a similar research and dataset by Estrin and Mickiewicz (2011).

Having high *entrepreneurial confidence* is, according to Trevelyan (2008), expected to have a positive effect on the decision of becoming an entrepreneur. *Entrepreneurial confidence* is measured by asking the surveillants how skilled they feel with their knowledge and experience to start a business. The binary variable holds “1” when they have entrepreneurial confidence and “0” when they do not. The variable *fear of failure* measures the extent to which the individual is afraid to fail when engaging in entrepreneurship. Literature suggests that a higher degree of fear of failure is related to a lower degree of entrepreneurial activity (Cacciotti & Hayton, 2015; Urbano & Alvarez, 2014). Additionally, according to Alvarez et al. (2011) there is a positive relationship between an individual feeling like there are good *opportunities* and possibilities for them to start up a business and the entrepreneurial activity in a country. This binary variable holds “1” when the individual experiences good opportunities and “0” if not. Subsequently, as suggested by Bosma and Schutjens (2010) and Davidsson and Honig (2003) having connections in an entrepreneurial network increases the probability of being engaged in entrepreneurship since it increases available opportunities. The variable *network* holds “1” when someone has made a personal connection in the past two years with someone who has already started a business, and “0” if not. These first four control variables are all perceptual factors. The next control variables are socio-demographic characteristics. The first factor is *age*. The relationship between age and entrepreneurial activity is negative. The negative relationship means that younger people have increased odds to get engaged in entrepreneurship (Liang et al., 2018). The variable *education* measures the educational level of the individual. As suspected by most literature, the higher level of education an individual has obtained, the higher the expected entrepreneurial activity (Johansen, 2010; Kolstad & Wiig, 2015; Raposo & do Paço, 2010). The variable *occupation* equals “1” if the respondent is working, or “0” if not. According to Johansen (2010) there is a positive relationship between being occupied and engaging in entrepreneurship in comparison with being unemployed.

To test whether these controls are ‘good’ control variables and they are not in a mechanism with gender I test their causal relationship in Appendix C table 5 (Angrist & Pischke, 2019; Lucifora, 2015). In table 5 a regression analysis is performed with the different individual level control variables as the dependent variables and gender as the independent variable. The results show that, when including all other controls in the model for completeness, gender has a significant effect on the variables *education*, *employment status*, *entrepreneurial confidence* and *fear of failure*. Its effect on *entrepreneurial opportunity* is statistically insignificant. This means one has to stay cautious when interpreting effects from



the estimated models. As explained later in the methodology, I will only interpret the sign and significance of the estimated parameters. Following Arabiyat et al. (2019), Estrin and Mickiewicz (2011) and Velilla et al. (2021) the individual level controls will remain in the model to identify individual differences. I test in chapter 5 whether the models in and excluding the bad controls give different results. Since it is not the case, I continue to work with all the control variables.

### **3.2.2. Country level variables**

#### *3.2.2.1. Independent variable*

The different measures of governmental institutions originate from The World Data Bank (2017), the GEM (2017) and Transparency International (2017). All variables are continuous. *Government size* is the expense percentage by the government of the GDP. Alesina and Wacziarg (1998) suggest that larger governments incur more costs, thus they have higher expenditures. The measurement for *education* as a governmental institution is depicted by the spending of the government on education as a percentage of the total GDP. The *regulatory business environment* is measured by the number of procedures one has to go through to be able to set up a business. The corruption index obtained by (Transparency International, 2017) is the measure of *governmental stability* in the nation. According to Graf Lambsdorff (2003) the level of corruption is strongly related to the governmental stability of a country. To measure *income regulations* as a governmental institution, the percentage of profit tax on commercial profits is used. This number is larger if income regulations are stricter (Chowdhury et al., 2018). Lastly, the *government support* on the entrepreneurial environment is measured by the GEM (2017). Their Governmental policies: the support and relevance variable, shows to which extent public policies are supportive towards entrepreneurship. All these institutions are considered to be important determinants of entrepreneurial activity (Chowdhury et al., 2018; Chowdhury et al., 2015; Darnihamedani et al., 2018; Dutta & Sobel, 2016; Hasan et al., 2017; Parker, 2007; Sternberg, 2014). By estimating the interaction term of the governmental institutional variable with the gender variable the hypotheses are tested.

#### *3.2.2.2. Control variables at the country level*

I follow the literature by adding *GDP per capita* and *GDP per capita growth* as control variables to address the differences in economic performance per country (Estrin & Mickiewicz, 2011). The literature suggests that bad economic performance pushes new entrepreneurs in entrepreneurship since the opportunity costs are lower. On the other hand, economic growth increases the expected benefits from entrepreneurship and pushes one into entrepreneurial activity (Parker, 2009). The literature also presents research on both the effect of economic

performance measures on entrepreneurial activity and the effect of entrepreneurial activity on economic performance (Baumol & Strom, 2007; Carree & Thurik, 2010; Rauch et al., 2012; Spencer & Gómez, 2004; Wennekers & Thurik, 1999).

The *export* variable indicates the connectivity of the country with other nations. For entrepreneurship it is important to have a large growing potential. In today's day and age there is a high grade of globalization. This means that to be able to compete in the market it is important to be connected across borders with other nations (Navarro-García, 2016). Higher affinity with export insinuates more entrepreneurial engagement in the country (Hessels & van Stel, 2011). Therefore, *export* is added as a variable to indicate the degree of connectivity. The variable *unemployment* indicates the percentage of the labor force that is unemployed. Literature suggests that unemployment is an important factor of the entrepreneurial activity in a country (Musa & Semasinghe, 2013). By some it is suggested that unemployment is a stimulator for entrepreneurship. When unemployment is high, it is most likely harder to find a job so people will create their own by engaging in entrepreneurship (Audretsch & Thurik, 1998). When the occupied workforce is large there are more potential entrepreneurs since working people are more likely to be engaged in entrepreneurship (Johansen, 2010). Lastly, the variable *resources* depict the level of total rents extracted from natural resources such as oil, gas, coal, mineral and forest rents as a percentage of the GDP. Having plenty of natural resources within reach can influence the entrepreneurial activity within a country negatively. Inhabitants are less likely to undertake entrepreneurial activities and innovation since they usually rely heavily on the extraction of natural resources. Residents of resource poor countries feel a stronger urge to engage in entrepreneurship since money has to be found elsewhere (Sachs & Warner, 2001).

Since I use a lot of controls in the model, it can be suspected that the variables might be multicollinear. This can cause standard errors to inflate. To check for this, I estimate the Variance Inflation Factor (VIF) in the next paragraph, in order to test for multicollinearity.

### 3.3. Descriptive statistics

All this data combined gives a dataset of 118,795 individuals across 50 countries over the year of 2017. Appendix A contains a list of all countries considered in this sample. Countries such as Puerto Rico and Taiwan are dropped from the sample since they lack consistency in the availability of the data. I only include individuals with ages between 18 and 64 since it is perceived to be the main working force as defined by the OECD (2022).

Table 1 displays the descriptive statistics. The table shows us that the majority of the individuals are not engaged in entrepreneurial activity. Table 6 in Appendix D presents the pairwise correlations of all variables used in this research. These do not raise any concerns for possible high correlation in the data.

To test more thorough for potential correlation, the Variance Inflation Factor (VIF) is estimated for the whole data sample. Table 7 in Appendix E shows the VIF scores that are conducted for all variables that are used in the analysis. The VIF score is used to check if the variables in the model are multicollinear (Kim, 2019). For the full model with all the variables, the mean VIF score is 2.97. According to Mansfield and Helms (2012) a threshold of a VIF score of 5 or higher is used to state if a model contains multicollinear variables. Therefore, in this research there is no concern for multicollinearity since the mean VIF is 2.97. The VIF score is way below the threshold of 5.

## 3.2 Methodology

In the second section I describe the methodology used to estimate the relationship between gender and entrepreneurial activity, and how governmental institutions moderate this relationship. Firstly, I test if there is a substantial difference in outcome of the dependent variable between clusters, thus if multilevel analysis is needed. Secondly, I test whether the multilevel logistic regression requires random varying slopes in the model. Lastly the final model is presented.

### 3.2.1 Multilevel logistic regression

According to Best and Wolf (2013) and Kay and Little (1987) a model with a binary dependent variable recommends the use of a logistic regression model since a linear regression model can be inappropriate (Sommet & Morselli, 2017). Additionally, in this research I use data on both the individual level and country level. Using a combination of both indicates that there is data on two levels. Thus, it is not justified to use a single-level logistic regression (Sommet & Morselli, 2017). Since the multilevel structure can lead to violation of the independence of residuals assumption it is suggested to adopt a multilevel perspective (Bressoux, 2010). Using a single level model in the case of multilevel data can bias the estimates of the parameters and the standard errors might be underestimated, which can lead to falsely rejecting the null hypothesis (Cheah, 2009; Daniels et al., 2004). All in all, a single-level logistic regression will not provide an unbiased estimation of the model (Sommet & Morselli, 2017).

Therefore, in this analysis I use a logistic multi-level regression. Using a multi-level model means that on one hand the value of the outcome variable can differ between clusters, and on the other hand the effect of a lower-level variable is allowed to differ between clusters (Sommet & Morselli, 2017).

Table 1: descriptive statistics

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
<b>Dependent variable</b>					
TEA	118,795	.128	.335	0	1
<b>Independent variables</b>					
Female	118,795	.485	.500	0	1
Government size	118,795	26.974	9.479	4.067	47.708
Education	118,795	4.433	1.111	2.133	7.569
Regulatory burden	118,795	7.075	2.615	2	14
Government stability	118,795	.532	.171	.24	.85
Income regulations	118,795	40.624	15.067	11.3	106
Government support policies	118,795	2.562	.493	1.56	3.75
<b>Individual level control variables</b>					
Age	118,795	39.307	13.078	18	64
Education	118,795				
Pre-primary education	118,795	.024	.155	0	1
Primary education	118,795	.094	.293	0	1
Lower secondary education	118,795	.170	.376	0	1
Upper secondary education	118,795	.315	.464	0	1
Post-secondary education	118,795	.137	.343	0	1
First-stage tertiary education	118,795	.236	.425	0	1
Second-stage tertiary education	118,795	.024	.152	0	1
Network	118,795	.411	.492	0	1
Employment status	118,795	.712	.453	0	1
Entrepreneurial confidence	118,795	.525	.499	0	1
Entrepreneurial opportunity	118,795	.441	.496	0	1
Fear of failure	118,795	.418	.493	0	1
<b>Country level control variables</b>					
GDP per capita	118,795	22,468.53	19,433.62	515.293	109,921
GDP per capita growth	118,795	3.059	1.911	-1.498	8.940
Unemployment	118,795	8.227	5.869	.14	27.04
Export	118,795	41.384	27.036	11.320	192.748
Natural resources	118,795	3.536	5.523	.002	24.323

### 3.2.2. Justification of the model

In order to see if the multilevel logistic regression is a good model to estimate the results that are used to test the hypothesis, I perform different validity tests (Sommet & Morselli, 2017). According to Sommet and Morselli (2017) there are two tests to find out if the multilevel regression model is the best method to analyze the data. Firstly, the null model is estimated to see whether there is need for analysis at multilevel. Secondly, there is a test to find out if the model needs a fixed or a random varying slope.

#### 3.2.2.1. Empty model and the Intraclass Correlation Coefficient

The first step to estimate whether multilevel logistic regression is a suitable model to test the hypothesis, is to run an empty model. The empty model, also called the null model is a model that has no independent or control variables included. The model is shown in equation 1. I use this model to check if there is clustering in the data, thus if it is needed to perform a multilevel analysis (Gordon, 1996).

$$\text{LogTEA}_{ij} = \alpha_0 + u_{0j} + \varepsilon_{ij}, \quad (1)$$

where *LogTEA* stands for the logarithmic odds that indicate whether the individual *j* is engaged in entrepreneurship when equal to one, or zero when they are not, in country *j*.  $\alpha_0$  is the fixed parameter of the model.  $u_{0j}$  indicates the variance of the fixed intercept for the different countries.  $\varepsilon_{ij}$  is the error term of the model.

The dependent variable of the multilevel model is a logit of the probability of the individual being engaged in Total Entrepreneurial Activity, then  $y = 1$ , divided by the probability of the individual not being engaged in Total Entrepreneurial Activity, then  $y = 0$ . Which means that the dependent variable  $\text{LogTEA}_{ij}$  is the logit of the odds ratio of an individual being engaged in entrepreneurship. Equation 2 portrays this value. Since the model is empty, there are no independent and control variables. Only the constant and the error term are present in the model.

$$\text{LogTEA}_{ij} = \text{Logit} \left( \frac{[\text{prob}(\text{TEA}_{ij}=y)]}{[\text{prob}(\text{TEA}_{ij}=0)]} \right), \quad (2)$$

where *LogTEA* stands for the logarithmic odds that indicate whether the individual *j* is engaged in entrepreneurship when equal to one, or zero when they are not in country *j*.

$[prob (TEA_{ij} = y)]$  indicates the probability if an individual is or is not engaged in Total Entrepreneurial Activity.

In a multilevel logistic regression, the outcome of the dependent variable is allowed to differ between clusters since the model can account for the difference. In a multilevel model there is supposedly variance across higher level groups. In this model, these higher-level groups are countries. There can also be variance within groups, so among individuals. Results from the empty model are used to test whether there is clustering in the data, thus if the outcome of the dependent variable varies between countries. If there are significant differences, it is needed to estimate the model from a multilevel perspective (Sommet & Morselli, 2017).

$$ICC = \frac{\textit{Between subject variance}}{\textit{between subject variance+within subject measurement variance}}, \quad (3)$$

$$ICC = \frac{var(u_{0j})}{var(u_{0j})+(\frac{\pi^2}{3})}, \quad (4)$$

where  $var(u_{0j})$  is the proportion of variation between countries for country  $j$ , and  $(\frac{\pi^2}{3})$  is the proportion of variation between individuals.

To test whether there is variation of odds of the dependent variable between clusters, i.e. if the proportion of individuals being engaged in entrepreneurial activity differs between countries, the Intraclass Correlation Coefficient (ICC) is calculated. The ICC is calculated with an empty model which only contains the dependent variable and no predictors (independent and control variables). Which is also called an ‘unconditional mean model’. The model allows to calculate the ICC (equation 3 and 4) which indicates variation of odds between countries (Wu et al., 2012). The ICC displays the proportion of variation between countries:  $(var(u_{0j}))$  and the proportion of the variation between individuals  $(\frac{\pi^2}{3})$ . The value of the ICC can range from 0 to 1. When the ICC is equal to 0 it means that there is perfect interdependence of residuals. In other words, the results of the model are not dependent on the cluster (in this case the country). If the ICC is 0, it could be suggested to run a basic one level regression since the different clusters are of no influence on the outcome of the dependent variable. When the ICC is equal to 1 it means that there is perfect interdependence of the residuals. An ICC of 1 indicates that the observations within the cluster are similar but they completely differ between clusters (Sommet & Morselli, 2017).

When calculating the ICC with the data that is going to be used to estimate the differing effect of governmental institutions for women on entrepreneurial activity, the Intraclass

Correlation Coefficient is 9,4% as can be seen in Appendix F table 8. This means that 9,4% of the variance of the data can be depicted to differences between countries, and 90,6% of the variance can be depicted to differences within countries. For the ICC to be considered high enough to perform multilevel analysis, the literature uses different thresholds. The paper by Pellis et al., (2004) considers an ICC of 10% a sufficient level of cross cluster variance for a multilevel regression to be performed. Heck et al., (2013) indicate the threshold lower at 5%. If the variation between groups is lower, using a multilevel model is not recommended since the differences between the groups are considered to be too small. Consequently (Ramos et al., 2016) also use the 5% as a threshold for a sufficiently sized ICC. Hence, in this research I use a 5% threshold to indicate the need for multilevel analysis. It means that the ICC of the dataset, which is 9,4% is considered sufficiently large enough to use multilevel regression.

### 3.2.2.2. *Constraint Intermediate model*

Now that I have investigated the variance of odds between clusters, we need to check in the second step whether the lower-level variables (individual level data) differ between clusters. The multilevel logistic regression can be designed by either including a fixed or a random parameter slope in the model. When slopes are random it suggests that the variables on the individual level are different among clusters, which means that the characteristics of the individuals differ across countries.

Some papers suggest that one should always use random slopes in multilevel logistic regression (Barr et al., 2013). Others suggest that always implementing random slopes could lead to over parametrization or failure of convergence. It could also be that the outcomes are not interpretable (Bates et al., 2015). Random parameter slopes can be used, but it needs to be tested whether using them is justifiable (Sommet & Morselli, 2017). Using fixed slopes opposed to random slopes indicates that the effect of gender and governmental institutions are the same for individuals across countries.

In order to do so, I test this with two models. Both a Constrained Intermediate Model (CIM), and an Augmented Intermediate Model (AIM) are performed and its deviances are compared with a likelihood ratio test to test which model fits better. The CIM indicates both individual and country level variables and does not include cross-level interactions and random effects. This is the model in equation 7.

$$\begin{aligned} \text{LogitTEA}_{ij} = & \alpha_0 + \beta_{1.0} \text{female}_{ij} + \beta_{2.0} X_{ij} + \beta_{0.1} \text{govsize}_j + \beta_{0.2} \text{educountry}_j + \\ & \beta_{0.3} \text{regburden}_j + \beta_{0.4} \text{govstab}_j + \beta_{0.5} \text{taxrate}_j + \beta_{0.6} \text{suppgov}_j + \beta_{0.7} \vartheta_j + u_{0j} + \varepsilon_{ij}, \end{aligned} \quad (5)$$

where  $LogitTEA_{ij}$  stands for the logarithmic odds that indicate whether the individual  $i$  is engaged in entrepreneurship when equal to one, or zero when they are not in country  $j$ .  $\alpha_0$  is the fixed parameter in the model.  $\beta_{1,0}$  represents the effect of *female* on  $LogitTEA_{ij}$ .  $\beta_{2,0}$  depicts the coefficient of the effect of the individual control variables, that are all represented by  $X_{ij}$  on  $LogitTEA_{ij}$ .  $\beta_{0,1}$ ,  $\beta_{0,2}$ ,  $\beta_{0,3}$ ,  $\beta_{0,4}$ ,  $\beta_{0,5}$  and  $\beta_{0,6}$  indicate the coefficient of the effect of government size, education spending, regulatory burden, governmental stability, income regulations and government support for country  $j$  on  $LogitTEA_{ij}$ .  $\beta_{0,7}$  indicates the effect of a particular country-level control variable, which are all represented by  $\vartheta_j$  for country  $j$  on  $LogitTEA_{ij}$ .  $u_{0j}$  indicates the variance of the fixed intercept for the different countries.  $\varepsilon_{ij}$  is the error term of the model.

### 3.2.2.3. Augmented Intermediate model

The difference between the augmented and the constraint model is that in the augmented model there is a residual term included for the concerned individual level variable. In this case the variable is *female*. The augmented model allows to estimate random slope variance which can be important when the individual level variables differ across clusters. Again, in the augmented model no interaction terms are included. This model is estimated in equation 6.

$$LogitTEA_{ij} = \alpha_0 + (\beta_{1,0} + u_{1j})female_{ij} + \beta_{2,0} X_{ij} + \beta_{0,1} govsize_j + \beta_{0,2} educountry_j + \beta_{0,3} regburden_j + \beta_{0,4} govstab_j + \beta_{0,5} taxrate_j + \beta_{0,6} suppgov_j + \beta_{0,7} \vartheta_j + u_{0j} + \varepsilon_{ij}, \quad (6)$$

where  $u_{1j}$  is the random slope parameter, which shows the divergence of the individual effect of gender on the entrepreneurial engagement within a country and the average effect.

Appendix G table 9 contains both the results of the estimated CIM and AIM models. These results indicate that the variance of female is 4,1% ( $var(u_{1j}) = 0.041$  and  $p < 0.01$ ) across countries. To see if random slope parameters are the best fit to use in the multilevel logistic regression, I compare the deviances of the constrained intermediate model and the augmented intermediate model. The deviance of a model is a misfit index which means that when the deviance is smaller the model fits better. This to determine whether including variation based on the cluster, will improve the estimation of the model or not. Additionally, I perform a likelihood ratio test to find whether fixed or randoms parameter slopes fit better.

The likelihood ratio test tests whether the deviance of the AIM is significantly lower compared to the CIM. If the deviance of the AIM is lower it means that the regression with the random slopes fits the data best, and is therefore a valid predictor since the relation of gender



and TEA differs per country. The differences between the deviances of the models is 40.076 ( $LR \chi^2(1) = 74,838.00 - 74,797.924 = 40.076$ ). This difference is statistically significant at the 1% level ( $p < 0.01$ ). Since it appears that the deviance of the CIM is significantly higher than the deviance of the AIM it means that including random slopes into the model of the variable *gender* results in the best fitted model.

$$LR \chi^2(1) = deviance (CIM) - deviance (AIM) \quad (7)$$

### 3.2.3. Complete specification

All in all, multilevel logistic analysis with random slopes is necessary to analyze the data correctly. After constructing the empty model and calculating the ICC, I find clustering in the data which justifies the use of a multilevel logistic regression. In this research a multilevel logistic model is investigated in the context of the cross-level interaction effect that governmental institutions have on the effect of one's gender on their entrepreneurial activity. Since the deviance of the AIM is significantly lower than the deviance of the CIM, I use random slopes in the model to account for the different relationship between gender and TEA per country. The model is formulated in equation 8 below.

$$\begin{aligned} LogTEA_{ij} = & \alpha_0 + (\beta_{1.0} + u_{1j}) female_{ij} + \beta_{2.0} X_{ij} + \beta_{0.1} govsize_j + \beta_{0.2} educountr_j + \\ & \beta_{0.3} regburden_j + \beta_{0.4} govstab_j + \beta_{0.5} taxrate_j + \beta_{0.6} suppgov_j + \beta_{0.7} \vartheta_j + \\ & \beta_{1.1} (female_{ij} * govsize_j) + \beta_{2.2} (female_{ij} * educountr_j) + \beta_{3.3} (female_{ij} * regburden_j) + \\ & \beta_{4.4} (female_{ij} * govstab_j) + \beta_{5.5} (female_{ij} * taxrate_j) + \beta_{6.6} (female_{ij} * suppgov_j) + u_{0j} + \\ & \varepsilon_{ij} \end{aligned} \quad (8)$$

where  $\beta_{1.1}, \beta_{2.2}, \beta_{3.3}, \beta_{4.4}, \beta_{5.5}, \beta_{6.6}$  indicate the coefficients that portray the interaction effect of  $female_{ij}$  and each governmental institution on  $LogTEA_{ij}$ .

## 4. Results

As has been discussed in the previous section, I use a multilevel logistic regression with random intercepts and slopes for gender to estimate the moderating effects of governmental institutions on the gender gap in entrepreneurial activity. Table 2 shows the estimates of the coefficient of the multilevel logistic regression model. Table 3 contains the odds ratio of the same predicted models. First, I discuss the results of the individual level and country level control variables. The third section contains the results of the estimates of the governmental

institution determinants. In the fourth section I present concerns about the interpretation of the interaction coefficients and discuss the hypotheses.

#### 4.1. Individual level control variables

Table 2 presents that the control variable *age* has a negative and significant relationship with engagement in entrepreneurship. This indicates that the older the individual is, they will less likely be engaged in entrepreneurship. The odds ratio from table 3 indicate that the odds that one is engaged in entrepreneurship will decrease with 2.3% per year that one has aged. This is in line with the expectations formed from the literature.

For the education variables all of them depict a negative relationship with entrepreneurial engagement. Only for *lower secondary* and *upper secondary* the relationship is statistically significant ( $p < 0.10$  and  $p < 0.05$ ). The negative and significant relationship indicates that individuals that have undergone these levels of education, have a lower engagement in entrepreneurship compared to individuals who have undergone only *pre-primary education*. A similar relationship is found for *primary education*, *post-secondary education*, *first-stage tertiary education* and *second-stage tertiary education*. However, the relationship for these coefficients is not statistically significant, thus cannot be interpreted. These estimates are also not in line with the literature.

The perceptual individual factors all indicate a significant ( $p < 0.01$ ) effect on entrepreneurial activity. The extent to which an individual experiences entrepreneurial confidence, a network of fellow entrepreneurs or if the individual perceives entrepreneurial opportunity has, as is expected, a positive and significant ( $p < 0.01$ ) effect on the level of TEA. The occupation of the individual, thus whether they are working or not, affects the entrepreneurial activity in a positive way. As indicated by the odds ratios in table 3 individuals that work are 3,54 times more likely to engage in entrepreneurship compared to individuals who are not working. The fear to fail is negative and significantly related to entrepreneurial engagement. It is suggested that fear of failure decreases the entrepreneurial engagement with 26% compared to individuals who are not afraid to fail. This was also suggested from the literature.

#### 4.2. Country level control variables

The country level control variables *GDP per capita*, *GDP per capita growth*, *unemployment* and *natural resources* indicate a negative but insignificant effect on engagement in entrepreneurship. Additionally, *export* has a positive but insignificant association with entrepreneurial engagement. Therefore, the effects cannot be interpreted.

### 4.3. Country level determinants

Table 2 shows that for the governmental institutions, only the coefficient of the *government support policies* has a negative ( $\beta = -0.286$ ) and significant ( $p < 0.05$ ) effect on the odds of one's entrepreneurial engagement. It suggests that a more supportive government towards entrepreneurial friendly conditions decreases the likelihood of an individual engaging in entrepreneurship. The negative and significant relationship is not in line with the expectations. A suggested explanation can be that governments are more likely to support entrepreneurship when the entrepreneurial climate is bad as an attempt to improve entrepreneurial undertake. Therefore, people tend to be less likely to be engaged in entrepreneurship when there is governmental support since the support is only present because there are no optimal entrepreneurial circumstances. Additionally, groups that could benefit the most from government support might not be reached by the support programs, which can cause them to have an opposing effect (Meyer, 2015). The remaining governmental institutions: *government size, education, regulatory burden, governmental stability* and *income regulations* have negative but insignificant ( $p > 0.10$ ) effects.

### 4.4. Interaction of individual and country level determinants

Before discussing the main results, one has to raise awareness that interpreting interaction effects in multilevel logistic regression is not very easy (Kolasinski & Siegel, 2010). When using logistic regression, the value of the interaction term can be biased. Therefore, researchers use special statistical software that allows to estimate the parameter of the interaction effect correctly (Norton et al., 2004). With multilevel logistic regression, the estimate of the product coefficient is sometimes not in agreement with the actual interaction effect (Sommet & Morselli, 2017). The software namely calculates the marginal effect which is not equal to the actual interaction effect (Ai & Norton, 2003; Karaca-Mandic et al., 2012). Where with logistic regression one can use special statistical packages to solve the problem, for multilevel models there is no such package that allows to estimate the interaction effects correctly since this is very complex. Contrary, multiple papers advocate that it is possible to interpret the interaction term of the multilevel model most of the times (Greene, 2010; Kolasinski & Siegel, 2010). To avoid a possible bias, only the sign and significance of the interaction coefficients are interpreted when either accepting or rejecting the hypotheses.

Reviewing the results presented in table 2, the first model provides evidence that supports the first hypothesis. The first hypothesis states that women across nations are less often engaged in entrepreneurial activity compared to men. This is proven by the negative ( $\beta = -0.074$ ) and statistically significant ( $p < 0.05$ ) effect of gender on entrepreneurial engagement. As is implied

from table 3, women are 7.1% less likely to be engaged in entrepreneurship compared to men. All in all, the first hypothesis cannot be rejected.

For the second hypothesis, in table 2 model 2, a negative ( $\beta = -0.011$ ) and statistically significant ( $p < 0.01$ ) interaction shows that the negative effect of government size on entrepreneurial activity is even stronger for female entrepreneurs in comparison with male entrepreneurs.

This supports the second hypothesis, which states that a larger government reduces the probability of women engaging in entrepreneurial activity even more in comparison to male entrepreneurial activity. As previously discussed, reasoning for this is that large governments are more likely to provide more jobs or assistance to their inhabitants in finding a job. This support can discourage more women from engaging in entrepreneurship compared to men. It is also suggested that women are more dependent on such stimulation or aid due to entrepreneurship being a male focused work field. When looking at the odds ratios in table 3, an increase in the percentage of governmental spending of the GDP with one percent, decreases the likelihood of women engaging in entrepreneurship with 1.1% in comparison to men. The size of the coefficient suspects that the effect is economically significant. All in all, the results are in line with the expectations, and the second hypothesis cannot be rejected.

Table 2 model 3 presents contrary results for the third hypothesis. The third hypothesis suggests that educational investments have a stronger positive effect on the probability of women getting engaged in entrepreneurial activity compared to men. The effect of the interaction effect that is found with the multilevel regression is however negative ( $\beta = -0.014$ ). The estimated effect suggests that increased spending on education by the government induces less women than men in entrepreneurial activity. The size of the coefficient suspects that the effect is economically significant. But, since the effect is statistically insignificant ( $p > 0.05$ ), the effect cannot be interpreted since the model is unable to estimate the coefficients precisely. All in all, the third hypothesis has to be rejected.

In the fourth model of table 3, a contrary relationship is found to what is suggested in the fourth hypothesis. The fourth hypothesis states that the suspected negative effect of increased regulatory burden on the probability of engaging in entrepreneurial activity is larger for women in comparison to men. In the model a positive ( $\beta = 0.057$ ) and statistically significant ( $p < 0.01$ ) relationship is found. This suggests that the suspected larger negative effect of additional regulations is attenuated for women. The odds ratio in table 3 implies that an additional entrance regulation increases the odds of women engaging in entrepreneurship by 5.8% more in comparison to men. The size of the coefficient suspects that the effect is economically significant. The positive and significant relationship leads to a rejection of the fourth hypothesis.

For the fifth hypothesis, in table 2 model five I find a negative ( $\beta = -0.797$ ) and statistically significant ( $p < 0.01$ ) interaction effect which shows that a more stable government reduces the probability of women engaging in entrepreneurship in comparison to men. The effect found is the opposite to what is stated in the fifth hypothesis, which suggests that governmental stability increases female entrepreneurial activity at a higher rate in comparison to male entrepreneurial activity. Thus, the expected effect of the governmental stability is weakened for women compared to men. The odds ratio in table 3 indicates that an increase of one point in the Corruption Perception Index decreases the odds of female entrepreneurship by 65,9% in comparison to men. The size of the coefficient suspects that the effect is economically significant. However, this suspected negative interaction effect rejects the fifth hypothesis.

Table 2 contains contrary results for both hypothesis six and seven. The sixth hypothesis states that increased taxes have a stronger negative effect on the probability of women being engaged in entrepreneurial activity in comparison to men engaging in entrepreneurial activity. From the estimated coefficients in model six, a positive relationship is detected ( $\beta = 0.003$ ). The positive relationship implies that when the tax burden of a country is higher, the negative effect of increased taxes is attenuated for women. However, the effect is so small that it suggests economic insignificance. The seventh hypothesis states that governmental support policies have a stronger positive effect for women engaging in entrepreneurial activity compared to men. In model seven a negative relationship is found ( $\beta = -0.086$ ) which indicates that a government that has more entrepreneurial support policies, decreases the probability of women engaging in entrepreneurial activity compared to men. Thus, the positive effect of the governmental institution is again attenuated for women compared to men. However, both effects are statistically insignificant ( $p > 0.10$ ), this means the model is unable to estimate the coefficients precisely, so they both cannot be interpreted and both hypotheses are rejected.

Model 8, which is the last model of table 2, contains all interaction effects of all independent governmental institutional variables with female. The interaction terms are similar to the previous estimation models. Except for the relationship between education and gender. The relationship turns positive ( $\beta = 0.043$ ) and statistically significant ( $p < 0.05$ ). This supports hypothesis 3. Additionally, the estimate of the interaction effect with governmental support is significant in model 8 compared to insignificant in model 7. The sign of the estimation remains the same. The estimation of the sign of the main effect of gender is similar to model 1 but the coefficient turns insignificant in the eighth model.

Interactions show that government size, regulatory burden and governmental stability have different effects on women and men engaging in entrepreneurial activity. Given the inconclusive sign of the direct effects of the institutions on entrepreneurial engagement, I show

the results by gender in Appendix H. The results in the Appendix provide even more support for the gender differences in the effect of institutions on entrepreneurial activity. Specifically government size and government stability affect women significantly in a more negative way in comparison to men.

Table 2: regression results from the multilevel logistic regression with TEA as dependent variable and random slopes for female.

Dependent variable = TEA	1	2	3	4	5	6	7	8	H
<b>Independent variables</b>									
Female	-.074** (.037)	.232** (.098)	.019 (.135)	-.452*** (.075)	.347*** (.087)	-.207** (.097)	.149 (.181)	.164 (.178)	H1
Government size		-.011 (.009)						-.0160* (.009)	
Education			-.014 (.058)					-.008 (.065)	
Regulatory burden				-.037 (.028)				-.039 (.029)	
Government stability					-.532 (.651)			-.165 (.816)	
Income regulations						-.004 (.005)		.003 (.005)	
Government support policies							-.286** (.134)	-.328** (.152)	
<b>Cross level interaction effect</b>									
Female * Government size		-.011*** (.003)						-.011*** (.003)	H2
Female * Education			-.021 (.030)					.043* (.023)	H3
Female * Regulatory burden				.057*** (.010)				.037*** (.010)	H4
Female * Government stability					-.797*** (.160)			-.345* (.186)	H5
Female * Income regulations						.003 (.002)		.003 (.002)	H6
Female * Government support policies							-.086 (.069)	-.116** (.052)	H7
<b>Individual level control variables</b>									
Age	-.013*** (.001)	-.013*** (.001)	-.013*** (.001)	-.013** (.001)	-.013*** (.001)	-.013*** (.001)	-.013*** (.001)	-.013*** (.001)	
Education									
Pre-primary education									
Primary education	-.106 (.075)	-.105 (.075)	-.106 (.075)	-.107 (.075)	-.104 (.075)	-.106 (.075)	-.106 (.075)	-.100 (.075)	
Lower secondary education	-.138* (.072)	-.136* (.072)	-.138* (.072)	-.139* (.072)	-.135* (.072)	-.137* (.072)	-.137* (.072)	-.130* (.072)	
Upper secondary education	-.168** (.070)	-.166** (.070)	-.167** (.070)	-.168** (.070)	-.164** (.070)	-.168** (.070)	-.167** (.070)	-.159** (.070)	
Post-secondary education	-.053 (.072)	-.052 (.072)	-.053 (.072)	-.054 (.072)	-.050 (.072)	-.053 (.072)	-.052 (.072)	-.044 (.072)	
First-stage tertiary education	-.108 (.071)	-.106 (.071)	-.108 (.071)	-.108 (.071)	-.105 (.071)	-.108 (.071)	-.107 (.071)	-.098 (.071)	
Second-stage tertiary education	-.073 (.090)	-.069 (.090)	-.073 (.090)	-.074 (.090)	-.072 (.090)	-.073 (.090)	-.072 (.090)	-.062 (.090)	
Network	.808*** (.020)	.807*** (.020)	.808*** (.020)	.808*** (.020)	.808*** (.020)	.808*** (.020)	.808*** (.020)	.807*** (.020)	
Employment status	1.264*** (.031)	1.264*** (.031)	1.264*** (.031)	1.266*** (.031)	1.266*** (.031)	1.264*** (.031)	1.264*** (.031)	1.270*** (.031)	
Entrepreneurial confidence	1.223*** (.024)	1.223*** (.024)	1.223*** (.024)	1.223*** (.024)	1.222*** (.024)	1.223*** (.024)	1.223*** (.024)	1.222*** (.024)	
Entrepreneurial opportunity	.405*** (.020)	.404*** (.020)	.405*** (.020)	.405*** (.020)	.404*** (.020)	.405*** (.020)	.405*** (.020)	.404*** (.020)	
Fear of failure	-.298*** (.021)	-.297*** (.021)	-.298*** (.021)	-.298*** (.021)	-.298*** (.021)	-.298*** (.021)	-.298*** (.021)	-.298*** (.021)	

<b>Country level control variables</b>								
GDP per capita	-0.000 (.000)	-0.000 (.000)	-0.000 (.000)	-0.000 (.000)	-0.000 (.000)	-0.000 (.000)	-0.000 (.000)	-0.000 (.000)
GDP per capita growth	-.021 (.041)	-.031 (.041)	-.022 (.041)	-.026 (.042)	-.021 (.041)	-.017 (.041)	-.008 (.040)	-.027 (.040)
Unemployment	-.021 (.015)	-.009 (.017)	-.021 (.015)	-.023 (.015)	-.022 (.015)	-.020 (.015)	-.027* (.014)	-.013 (.016)
Export	.001 (.003)	.002 (.003)	.000 (.002)	.000 (.003)	.000 (.003)	-.000 (.003)	-.000 (.002)	.002 (.003)
Natural resources	-.020 (.015)	-.031* (.016)	-.020 (.015)	-.017 (.015)	-.021 (.015)	-.024 (.015)	-.013 (.014)	-.021 (.016)
<b>Fixed parameter</b>								
Constant	3.243*** (.274)	2.987*** (.334)	3.184*** (.366)	2.930*** (.369)	3.056*** (.372)	3.033*** (.359)	2.573*** (.409)	1.848*** (.565)
<b>Variant parameters</b>								
Random intercept variance	.214*** (.045)	.205*** (.043)	.214*** (.045)	.219*** (.046)	.216*** (.045)	.213*** (.045)	.195*** (.041)	.184*** (.039)
Random slope variance	.042*** (.013)	.032*** (.011)	.042*** (.013)	.016*** (.046)	.019*** (.008)	.039*** (.012)	.039*** (.013)	.003 (.004)
ICC	6.12%	5.87%	6.11%	6,25%	6.16%	6,07%	5.58%	5,32%

Notes: \*\*\* $p < 0.01$ , \*\* $p < 0.05$  and \* $p < 0.0$ . Standard error in parentheses. Number of individual observations: 118,795. Number of countries: 50



Table 3: odds ratio results from the multilevel logistic regression with TEA as dependent variable and random slopes for female.

Dependent variable = TEA	1	2	3	4	5	6	7	8	H
<b>Independent variables</b>									
Female	.929** (.034)	1.261** (.123)	1.020 (.138)	.637*** (.048)	1.415*** (.123)	.813** (.079)	1.161 (.210)	1.178 (.210)	H1
Government size		.989 (.009)						.984* (.009)	
Education			.986 (.057)					.992 (.064)	
Regulatory burden				.963 (.027)				.962 (.028)	
Government stability					.587 (.382)			.847 (.692)	
Income regulations						.996 (.005)		1.003 (.005)	
Government support policies							.751** (.101)	.720** (.111)	
<b>Cross level interaction effect</b>									
Female * Government size		.989*** (.003)						.989*** (.003)	H2
Female * Education			.979 (.029)					1.044* (.024)	H3
Female * Regulatory burden				1.058*** (.011)				1.037*** (.010)	H4
Female * Government stability					.451*** (.072)			.708* (.132)	H5
Female * Income regulations						1.003 (.002)		1.003 (.002)	H6
Female * Government support policies							.917 (.063)	.890** (.046)	H7
<b>Individual level control variables</b>									
Age	.987*** (.001)	.987*** (.008)	.987 (.138)	.987*** (.001)	.987*** (.001)	.987*** (.001)	.987*** (.001)	.987*** (.001)	
Education									
Pre-primary education									
Primary education	.899 (.068)	.901 (.068)	.900 (.068)	.899 (.068)	.901 (.068)	.900 (.068)	.900 (.068)	.905 (.068)	
Lower secondary education	.871* (.063)	.873* (.063)	.871** (.063)	.870* (.063)	.873* (.063)	.872* (.063)	.872* (.063)	.878* (.063)	
Upper secondary education	.846** (.059)	.847** (.059)	.846** (.059)	.846** (.059)	.848** (.059)	.846** (.059)	.846** (.059)	.853** (.059)	
Post-secondary education	.948 (.068)	.950 (.069)	.948 (.069)	.948 (.068)	.952 (.069)	.948 (.069)	.949 (.069)	.957 (.069)	
First-stage tertiary education	.898 (.063)	.900 (.064)	.898 (.063)	.897 (.063)	.900 (.064)	.898 (.063)	.898 (.063)	.907 (.064)	
Second-stage tertiary education	.930 (.083)	.934 (.084)	.930 (.083)	.928 (.083)	.931 (.083)	.930 (.083)	.930 (.083)	.940 (.084)	
Network	2.244*** (.046)	2.243*** (.046)	2.244*** (.046)	2.243*** (.046)	2.243*** (.046)	2.244*** (.046)	2.243*** (.046)	2.242*** (.046)	
Employment status	3.538*** (.109)	3.541*** (.109)	3.539*** (.109)	3.546*** (.109)	3.548*** (.110)	3.539*** (.109)	3.538*** (.109)	3.561*** (.111)	
Entrepreneurial confidence	3.399*** (.082)	3.397*** (.082)	3.398*** (.082)	3.397*** (.082)	3.394*** (.082)	3.399*** (.082)	3.398*** (.082)	3.393*** (.082)	
Entrepreneurial opportunity	1.499*** (.030)	1.498*** (.030)	1.499*** (.030)	1.499*** (.030)	1.498*** (.030)	1.499*** (.030)	1.499*** (.030)	1.498*** (.030)	

Fear of failure	.742*** (.015)	.743*** (.015)	.742*** (.015)	.742*** (.015)	.743*** (.015)	.742*** (.015)	.742*** (.015)	.742*** (.015)
<b>Country level control variables</b>								
GDP per capita	1.000** (.000)	1.000** (.000)	1.000** (.000)	1.000** (.000)	1.000 (.000)	1.000** (.000)	1.000 (.000)	1.000 (.000)
GDP per capita growth	.979 (.040)	.997 (.040)	.979 (.040)	.974 (.041)	.979 (.041)	.983 (.041)	.992 (.040)	.973 (.039)
Unemployment	.979 (.014)	.991 (.016)	.980 (.014)	.977 (.015)	.979 (.014)	.980 (.014)	.974* (.014)	.987 (.016)
Export	1.001 (.003)	1.002 (.003)	1.000 (.003)	1.000 (.003)	1.000 (.003)	1.000 (.003)	1.000 (.002)	1.002 (.003)
Natural resources	.980 (.014)	.970* (.015)	.980 (.014)	.984 (.015)	.979 (.014)	.977 (.015)	.987 (.014)	.980 (.016)
<b>Fixed parameter</b>								
Constant $\alpha_0$	.039*** (.011)	.050*** (.017)	.041*** (.015)	.053*** (.020)	.047*** (.018)	.048*** (.017)	.076*** (.031)	.157*** (.089)
<b>Variant parameters</b>								
Random intercept variance	.214*** (.045)	.205*** (.043)	.214*** (.034)	.219*** (.046)	.216*** (.045)	.213*** (.045)	.195*** (.041)	.185*** (.039)
Random slope variance	.042*** (.013)	.033*** (.011)	.041*** (.013)	.016*** (.008)	.019*** (.008)	.039*** (.012)	.039*** (.013)	.003 (.004)
ICC	6.12%	5.87%	6.11%	6.25%	6.16%	6.08%	5.58%	5.32%

Notes: \*\*\* $p < 0.01$ , \*\* $p < 0.05$  and \* $p < 0.01$ . Standard error in parentheses. Number of individual observations: 118,795. Number of countries: 50

## 5. Robustness analyses

### 5.1. Country control variables from 2016

In the main analysis all data originates from the year 2017. However, it can be suspected that individuals tend to rely their choices to engage in entrepreneurship on the external environment of earlier years, rather than the year of surveillance (Reed, 2015). Some argue that the decision to engage in entrepreneurship can therefore be expected to rely more on the economic environmental conditions of the year of 2016 (Dheer et al., 2019). Therefore, I estimate the same model as previously described, but instead of using country level control variables of 2017, the values of the year of 2016 are included to test the robustness of the main analysis. Tables 12 and 13 of Appendix I contain the results of this regression. The results suggest that there is no difference with the previous estimated model with the control variables from the year 2017. The only difference that is depicted is that *GDP per capita* generally gives a negative and significant effect opposed to a negative and insignificant effect in table 8 and 9. Overall the conclusions about my hypotheses do not change due to the difference in control variables.

### 5.2. Alternative measures

In order to test the robustness of the model used in the main analysis, I use different measures of governmental institutions in order to depict if these indicate a differing effect compared to

the main estimation. Since governmental institutions are not exactly measurable there are multiple factors that could be used to give an indication of its importance or effect.

Alternative measures of the following governmental institutions are available: *education, regulatory burden, government stability* and *income regulations*. For education as a governmental institution, I use the percentage of the population that has completed tertiary education to measure how involved the government is in the quality of the education of a country. Literature suggests that more investments in education lead to a higher educated population (Levin et al., 2007; Psacharopoulos & Patrinos, 2010). This insinuates that a county with a high educated population is engaged in improving education as a governmental institution. To measure the regulatory burden, instead of number of procedures, days to set up a business is used as an indication. Kurtz and Schrank (2021) imply that the more days one needs to be able to set up a business is related to high regulatory burden in a country. Therefore, the measure aligns nicely with the previously used numbers of procedures to measure the regulatory burden. Both the *education* and *regulatory burden* measures originate from data collected by the World data bank in 2017 (The World Data Bank, 2017). An alternative measure for *governmental stability* is the *political stability index* from The Global Economy (2017). The *political stability index* indicates the extent to which there is terrorism or a chance of governmental destabilization in the target country. The measure is on a scale of -2.5 to 2.5, where -2.5 indicates a weak political stability and 2.5 a strong political stability. Lastly, the indicator for *income regulations* is replaced by the *tax attractiveness index* by Tax Index (2017). The index ranges from 0 to 1 where 0 indicates that components such as anti-avoidance rules, corporate income tax rate or the holding tax climate are very unfavorable. When the index is 1 it means that the country has very favorable tax conditions. When including all these alternative measures, it is tested whether similar determinants give differing results for the interaction effects estimated with the main model in tables 2 and 3.

The model I use is again a multilevel logistic regression with random intercepts and slopes for gender to estimate the moderating effects of governmental institutions on the effect of gender on entrepreneurial activity. Equation 9 depicts the model; this model is entirely similar to the model described in the data and methodology section. However, this time I use different measures for *education, regulatory burden, government stability* and *income regulations*.

$$\begin{aligned}
 \text{LogTEA}_{ij} = & \alpha_0 + (\beta_{1.0} + u_{1j}) \text{female}_{ij} + \beta_{2.0} X_{ij} + \beta_{0.1} \text{educountr}_j + \beta_{0.2} \text{regburdendays}_j + \\
 & \beta_{0.3} \text{politicalstabilityindex}_j + \beta_{0.4} \text{taxattractiveness}_j + \beta_{0.5} \vartheta_j + \beta_{1.1} (\text{female}_{ij} * \\
 & \text{educountr}_j) + \beta_{2.2} (\text{female}_{ij} * \text{regburdendays}_j) + \beta_{3.3} (\text{female}_{ij} * \\
 & \text{politicalstabilityindex}_j) + \beta_{4.4} (\text{female}_{ij} * \text{taxattractiveness}_j) + u_{0j} + \varepsilon_{ij} \quad (9)
 \end{aligned}$$

I use the same sample of 118,795 individuals from 50 countries worldwide. The names of countries where the respondents are from are listed in Appendix I. To assess the robustness of the main analysis I compare the results of table 2 and 3 with the results of the robustness check in Appendix J table 14 and 15.

In both table 2 model 3 and Appendix J table 14 model 2 the interaction effect of the education measure and gender on an individual's entrepreneurial activity is negative ( $\beta = -0.021$  and  $\beta = -0.004$ ) for female entrepreneurial engagement in comparison to male entrepreneurial engagement. The estimation of the second model differs in one aspect with the original estimation. In the estimation with the alternative measure of education the negative effect is significant ( $p < 0.05$ ) compared to not significant in the main analysis of table 2. According to the odds ratio in Appendix J table 15 it is suggested that when the percentage of tertiary educated people goes up by 1%, this decreases the odds of women being engaged in entrepreneurial activity by 0.4% in comparison to men. Thus, in both models education has a more negative effect on entrepreneurial activity for women in comparison with men, which is in contradiction to what is stated in hypothesis 3. However, the negative moderating effect is only significant in the analysis with the alternative measures. Reasoning for the larger negative effect could be that higher education leads to a higher awareness among women about their disadvantages in entrepreneurship which would discourage them more from entrepreneurship in comparison to men (Oosterbeek et al., 2010).

The remaining estimated interaction effects of *regulatory burden*, *government stability* and *income regulations* have a similar sign and significance as the main estimation in tables 2 and 3. A more precise interpretation of these coefficients can be found in Appendix K. All in all, with the exception of the effect of education, all the results seem to be robust.

### 5.3. Alternative sample

The descriptive statistics suggest that from all 118,795 observations of the 50 countries in the data set, 17,688 are conducted from Spain. This indicates that 14,89% of all observations are from a single country in the sample. To figure out if results are biased and dominated by respondents from Spain, I estimate a model with a sample that excludes the Spanish observations. This results in a new sample with 101,107 observations from 49 different countries. The list of countries is presented in Appendix L. Table 16 from Appendix M presents the results of the multilevel logistic regression coefficients of the alternative sample which excludes data from Spain. The estimates clearly suggest that there are hardly any differences between the estimates of the interaction effect in the main model and in the model with the alternative sample. All interaction effects indicate the same sign and significance as before.

Therefore, it is stated that the estimations of the main multilevel logistic regression are not driven by data from Spain.

#### 5.4. Alternative method

In section 3 I argue that due to the multiple dimensions in the data it is recommended to use a multilevel logistic regression. According to (Moehring, 2021) a good alternative to a multilevel logistic regression is a fixed effects regression. A fixed effects regression is able to account for both country and individual fixed effects, thus controls for their heterogeneity in estimating a causal effect. One pitfall of fixed effects regression in the case of the dataset is that over the span of three years, only 34.815 individuals have participated in all three years of the survey. Thus, only a sample of 26 countries remains which is mostly driven by data from Mexico. The list of the countries in the fixed effects regression is in Appendix N. All in all, the limited dataset that remains after converting it to panel data suggests that a multilevel logistic regression is a better model to test for more country inclusive results (Slack & Draugalis, 2001). To test if the results are not dependent on the estimation method, I estimate the same results but with the fixed effects regression.

With a fixed effects regression, within-individual variation estimates a causal effect. In such a model you are able to account for time-invariant individual, country and time characteristics, both observed and unobserved.

For the fixed effects estimation, the same dependent, independent and control variables are used as for the multilevel logistic regression. The data contains observations from 34.815 individuals from 26 different countries in the years 2015 until 2017. Only a three-year observation period is used to maximize the number of observations, but still be able to estimate the country, time and individual fixed effects. The model for the fixed effects regression becomes:

$$\begin{aligned}
 \text{LogTEA}_{ij} = & \alpha_0 + \beta_{1.0} \text{female}_{ijt} + \beta_{2.0} X_{ijt} + \beta_{0.1} \text{govsize}_{jt} + \beta_{0.2} \text{educountr}_{jt} + \\
 & \beta_{0.3} \text{regburden}_{jt} + \beta_{0.4} \text{govstab}_{jt} + \beta_{0.5} \text{taxrate}_{jt} + \beta_{0.6} \text{suppgov}_{jt} + \beta_{0.7} \vartheta_{jt} + \\
 & \beta_{1.1} (\text{female}_{ijt} * \text{govsize}_{jt}) + \beta_{2.2} (\text{female}_{ijt} * \text{educountr}_{jt}) + \beta_{3.3} (\text{female}_{ijt} * \\
 & \text{regburden}_{jt}) + \beta_{4.4} (\text{female}_{ijt} * \text{govstab}_{jt}) + \beta_{5.5} (\text{female}_{ijt} * \text{taxrate}_{jt}) + \\
 & \beta_{6.6} (\text{female}_{ijt} * \text{suppgov}_{jt}) + \beta_{0.8} * \text{year}_t + \beta_{0.9} * \text{country}_{jt} + \beta_{0.10} * \text{id}_{ijt} + \varepsilon_{ijt} \quad (10)
 \end{aligned}$$

Where  $\text{TEA}_{ijt}$  stands for the binary variable that indicate whether the individual  $j$  is engaged in entrepreneurship when equal to one, or zero when they are not in country  $j$  at time  $t$ .  $\alpha_0$  is the fixed parameter in the model that indicates the unobserved time-invariant individual effect.  $\beta_{1.0}$  represents the effect of *female* on  $\text{TEA}_{ijt}$ .  $\beta_{0.2}$  depicts the coefficient of the effect of the

individual control variables, that are all represented by  $X_{ij}$  on  $TEA_{ijt}$ .  $\beta_{0.1}$ ,  $\beta_{0.2}$ ,  $\beta_{0.3}$ ,  $\beta_{0.4}$ ,  $\beta_{0.5}$  and  $\beta_{0.6}$  indicate the coefficient of the effect of government size, education spending, regulatory burden, governmental stability, income regulations and government support for country  $j$  at time  $t$  on  $TEA_{ijt}$ .  $\beta_{0.7}$  indicates the effect of a particular country-level control variable, which are represented by  $\vartheta_j$  for country  $j$  at time  $t$  on  $TEA_{ijt}$ .  $year_t$ ,  $country_{jt}$  and  $id_{ijt}$  are vectors for time, country and individual fixed effects.  $\varepsilon_{ijt}$  indicates the error term of the model.

Table 18 in appendix O contains the results of the estimated fixed effects model. To compare the robustness of the main analysis the fixed effect estimates are compared to the main estimation in table 2. The effect of being a woman on entrepreneurial activity is according to model 1 table 18 in Appendix O positive ( $\beta = 0.014$ ) and significant ( $p < 0.01$ ). This is the opposite to the result in model 1 of table 2 which indicates that being a woman has a negative ( $\beta = -0.074$ ) and significant ( $p < 0.05$ ) effect on entrepreneurial activity. The coefficient estimated with the fixed effects regression is contrary to hypothesis 1 and indicates that the engagement of women in entrepreneurship is 0.014 points higher compared to men.

In model 2 of table 2 and model 2 in Appendix O table 18 the estimates of the interaction effect of gender and government size are estimated. Opposed to the results of the main model, the fixed effects model estimates an attenuative effect for women compared to men on the negative relationship between government size and entrepreneurial activity. This is in contrast with hypothesis 2 which states that the negative effect of government size is even stronger for female entrepreneurial engagement, compared to male entrepreneurial engagement. However, the effect seems to be insignificant, thus cannot be interpreted.

The interaction term of education with gender, displayed in model 2, indicates a positive ( $\beta = 0.007$ ) and significant ( $p < 0.01$ ) relationship. The effect suggests that a one percentage increase of educational spending of the GDP increases female entrepreneurial activity with 0.007 points compared to male entrepreneurial activity. This is not in line with the results found in table 2, but confirms the third hypothesis which states that education has a stronger positive effect on female entrepreneurial engagement in comparison to male entrepreneurial engagement.

Both the interaction effects of gender and regulatory burden and gender and government stability estimated in the fixed effect model are similar to their estimation in the main model. The interaction coefficient of gender and regulatory burden is, according to Appendix O table 18, positive ( $\beta = 0.002$ ) and significant ( $p < 0.01$ ). The positive and significant coefficient indicates that for women, an extra regulation increases their entrepreneurial engagement with 0.002 points compared to men.

The interaction effect of gender and governmental stability in Appendix O table 18 is positive ( $\beta = 0.000$ ) as in table 2, but appears to be insignificant ( $p > 0.05$ ). The interaction effect of income regulations and gender is in both the main model and the fixed effects model positive ( $\beta = 0.003$  and  $\beta = 0.000$ ) and insignificant.

In model 7 of Appendix O table 18 the interaction term of gender and government support policies indicates a positive ( $\beta = 0.009$ ) but insignificant ( $p < 0.05$ ) effect. This effect is corresponding with what is stated in hypothesis 7, but contrary to the results in table 2.

All signs of the interaction terms in model 8 of Appendix O table 18 are similar as estimated in the individual estimation model, except for the interaction term of gender and government size, gender and education and gender and government support policies. Additionally, most of the interaction effects estimated in the fixed effects model are insignificant. Thus, most but not all the results seem to be robust.

### 5.5. Good controls

As I have previously argued in the data and methodology section, various individual control variables can be perceived to be 'bad' controls. Bad controls can introduce a mechanism into the model, and therefore can give biased estimations of the coefficients. Appendix C table 5 suggests that gender has a significant effect on *education*, *employment status*, *entrepreneurial confidence* and *fear of failure*. Because I followed the literature from Arabiyat et al. (2019); Estrin and Mickiewicz (2011) and Velilla et al. (2021) I still included all individual level control variables in the main model. However, including bad controls can give biased estimations of the coefficient (Angrist & Pischke, 2019; Lucifora, 2015). To estimate if excluding the bad controls from the estimation model would give different effects, in Appendix P tables 19 and 20 *education*, *employment status*, *entrepreneurial confidence* and *fear of failure* are excluded from the multilevel logistic model. These results show that when excluding the bad controls from the estimation, the interaction effects of interests show similar sign and significance to the model which includes the bad controls.

## 6. Conclusion, discussion and limitations

In this section I will first conclude by addressing the most important findings from the empirical analysis to answer the research question. Consequently, I will discuss and explain the results of the performed multilevel logistic regression. Finally, the limitations and the recommendations for further research are presented.

## 6.1. Conclusion

The literature has paid increasing attention to explaining the gender gap in entrepreneurship. Plenty of research is already conducted on the effect individual contextual factors, such as one's personality and motives to become an entrepreneur, have on entrepreneurial engagement. It is also often researched, how these factors differ for men and women, thus in context of the gender gap, is an often-researched field as well. Contextual factors are a crucial building block to explain the gender gap in entrepreneurship (Bergmann & Stephan, 2013). An important determinant of the contextual environment is imposed by governmental institutions (Yay et al., 2018). Governmental institutions are a structure of established prevalent rules to structure interactions (Hodgson, 2006). Through these rules and structures the government can have a significant impact on the economic, but also the entrepreneurial performance of individuals (Mohammadi Khyareh, 2017; Yay et al., 2018). In this research I have investigated the moderating effect that different governmental institutions have on the causal effect of gender on entrepreneurial activity, by trying to answer the following question;

*How does the governmental imposed institutional environment influence the engagement in entrepreneurship of women in comparison with men?*

This investigation attempts to close the gap in research where research is conducted on the direct effect governmental institutions such as government size, education, regulatory burden, governmental stability, income regulations and governmental support policy have on entrepreneurial activity, but not how this effect differs for men and women. In order to do so I use individual level data to determine gender and entrepreneurial activity, and country level data to indicate governmental institutions. To estimate the interaction effects, this research makes use of a multilevel logistic regression model with interactions of gender and governmental institutions as the independent variable and the Total early-stage Entrepreneurial Activity (TEA) rate as the dependent variable. Using individual level data from the APS of the GEM (2017) and country level data from The World Data Bank (2017), I investigate different hypotheses in order to collectively use them to answer the main question.

The results of the multilevel logistic regression empirically support the hypothesis which states that women are less likely to be engaged in entrepreneurial activity compared to men. Corresponding to suggestions from the literature, a government of large size is found to have a stronger negative effect on female entrepreneurial engagement compared to male entrepreneurial engagement. Reasoning for this is that larger governments are usually providing more jobs and better labor conditions which does not urge women into entrepreneurship. The estimations of the interaction effects of education, income regulation and government support policies as governmental institutions indicate to be insignificant. The



insignificant effect means that the model does not have enough statistical power to estimate the effect precisely thus according to the model it has no significant effect on the entrepreneurial activity. The expected negative effect of a higher regulatory burden is significantly attenuated for women compared to men, which indicates that a higher regulatory burden induces more women into entrepreneurial activity compared to men. This is contrary to the effect that is suspected from the literature, which suggests that a higher regulatory burden leads to less women than men engaging in entrepreneurial activity. For the hypothesis that states that governmental stability has a larger positive effect for women than men on entrepreneurial activity, I find contrary evidence. The results indicate that when a government is more stable, it reduces female entrepreneurial activity in comparison to male entrepreneurial activity. The results estimated in the main model are all found to be robust.

All in all, I can establish that women are less likely to be engaged in entrepreneurship in comparison to men. To answer the research question, empirical findings suggest that an increase in both government size and government stability reduces the engagement of women in entrepreneurship in comparison to men. Additionally, the suspected negative effect of a high regulatory burden on entrepreneurial activity is weakened for women compared to men. Thus, more regulations induce more women than men into entrepreneurial activity. The estimations of education, income regulations and government support policies are found to have an insignificant effect on entrepreneurial activity. This all suggests that governmental institutions have a heterogeneous effect on entrepreneurial activity depending on one's gender.

## 6.2. Discussion

As expected from the literature, the effect of government size on entrepreneurial activity is negative. Some scholars argue that this negative relationship is because larger governments provide more jobs and better working conditions (Bosma et al., 2018). This can nudge individuals out of entrepreneurship and in to employment. However, this effect is insignificant.

Unexpectedly, education has a negative and insignificant effect on entrepreneurial activity. According to Oosterbeek et al., (2010), education, especially entrepreneurial education, can negatively influence entrepreneurial activity. Reasoning for this is that an individual that is highly educated (about entrepreneurship) is able to estimate the eventual pitfalls of entrepreneurship better. Additionally, the effect of education can differ among cultures and ethnicities, which can also advocate for insignificant power to estimate the coefficients (Thompson et al., 2010).

The coefficient of regulatory burden shows the expected negative relationship which suspects that a higher regulatory burden decreases entrepreneurial activity. This is because a higher regulatory burden creates a barrier to start out in entrepreneurship and nudges individuals in employment which is then considered easier (Chowdhury et al., 2015; Levie &

Autio, 2011). And as I discuss later in the limitations, the insignificance of the effect can be due to the varying strictness of the regulations and the differing effects regulations can have per sector. This can lead to insignificant statistical power to estimate the true coefficient.

Contrary to the expectations government stability suspects a negative and insignificant relationship with entrepreneurial activity. There is no evidence that suggests this possible negative relationship. The inconvenience and instability that governmental instability causes are in no way expected to be supportive for the entrepreneurial climate (Avnimelech et al., 2014; Chowdhury et al., 2018; Dutta et al., 2013).

As suspected, a higher tax burden has a negative relationship with entrepreneurial activity. This relationship is however insignificant and the coefficient is very small. This both can be due to the potential outweighing effect of social entrepreneurship which is not primarily focused on making profits (Estrin et al., 2013). Therefore, income regulations can be suspected to not have a very strong and negative effect on entrepreneurial activity.

Government support policies have a negative and significant effect on entrepreneurial activity which is contrary to the expectations. An explanation for this can be that governments tend to be only more supportive when the entrepreneurial climate is unfavorable. In a bad entrepreneurial climate people are already less likely to be engaged in entrepreneurship. Additionally, it can also be the case that the support programs are unable to reach their target group (Meyer, 2015).

Reasoning for the insignificance of the interaction effect of education for women on entrepreneurial activity can be directed to the rising engagement of women in education. According to Pekkarinen (2012) women are starting to overrepresent men in education. They are less likely to drop out, and are more often highly educated. This might be in fact an over exaggeration, but women are indeed more educated compared to past practices where men were by far the only gender to be able to engage in education (van Bavel et al., 2018). The rise of women in education can be an argument to support the insignificance of the estimated interaction effect. It could be that the higher positive effect that education was suspected to have on entrepreneurial activity for women in comparison to men is because women were generally lower educated (Piva & Rovelli, 2021). Lower education among women would mean that more education would increase their entrepreneurial activity at a higher rate since, in comparison with men, they would already receive way less education. But as one gets more education, an increase in education has a diminishing effect on entrepreneurial engagement (Trostel, 2019). Thus, the suspected increased effect that education may have for women in comparison to men on entrepreneurial activity can be insignificant. This since both genders may react similar to education as the presence of women in higher education has already increased over the last couple of years.

Contrary to what is expected from the literature, in table 8 model 5, a more stable government is found to decrease female entrepreneurial engagement. An argument for the unexpected negative relationship can be that a stable government can provide more jobs compared to unstable governments. When there is less corruption, a stable organization of authorities and more security will have a positive effect on the economic performance of that country, thus the government can hire more people (Ehrlich & Francis, 2015). It is previously argued that women experience more difficulties when setting up a business, and therefore are less likely to do so (Miranda et al., 2017; Santos et al., 2016). Thus, if there are more jobs provided by the government, which is often seen as a very secure employer, this decreases the need for women to engage in entrepreneurial activity in comparison with men. The literature overall suggests a more negative effect of governmental stability on the entrepreneurial activity for women in comparison with men.

There is also an explanation for the significant positive interaction effect of the regulatory burden with gender which is presented in table 2 model 4. When there is a high regulatory burden imposed by the government on prospective entrepreneurs, participation in the informal economy is stimulated (Andrews et al., 2011). Entrepreneurs enter the informal economy to avoid the excessive number of steps one may have to take when engaging in entrepreneurship. As has been previously discussed, women face more obstacles when setting up a business, and as hypothesized, can be more harmed by regulations in comparison to men. Therefore, it can be suspected that when regulatory burden is high, women are more likely to engage in entrepreneurship in the informal economy where they will be less bothered with the regulatory burden (Fonchingong, 2005). This would impose that an increase in regulatory burden would have a more positive effect on the engagement of women in (informal) entrepreneurship in comparison to men.

Unexpectedly, income regulations and governmental support policies have an insignificant interaction effect on the odds of women engaging in entrepreneurial activity. It indicates that both income regulations and governmental support do not moderate the relationship of gender and entrepreneurial activity. As far as I am concerned no empirical research is yet investigated on the gender difference of the effect of income regulations on entrepreneurial activity. As suggested by Vossenbergh (2013) it is an important field of research since income regulations can impose a barrier when engaging in entrepreneurship. Since there is evidence of a negative effect of income regulations on entrepreneurial engagement it can still be suspected that income regulations are unfavorable for entrepreneurship (Chowdhury et al., 2018). The presence of higher entry barriers for women in entrepreneurship can still lead to suggesting that income regulations have a negatively moderating effect for women (Guzman & Kacperczyk, 2019; Miranda et al., 2017; Sweida & Reichard, 2013).

According to Vossenbergh (2013) special governmental support policies that promote female engagement in entrepreneurial activity are found to help and close the gender gap to a certain extent and indicates that governmental support policies can, in fact, positively moderate female entrepreneurial engagement. Reasoning for the insignificant results can come from the perspective that the measurement for government support policies I use in this research is overall a more general measure and not specifically focused on support policies for women. This can lead to the insignificance of the estimated.

### 6.3. Limitations

Having a sufficient sample size is an important factor of the quality of one's research and is often first noticed as criticism (Świątkowski & Dompnier, 2017). For models with only one level, one exclusively looks at the grand total of observations and judges the sample size by that matter. When using a multilevel model, the number of individual observations per cluster is not very important regarding the research quality. Various papers suggest that one of the main limitations of multilevel logistic regression is an insufficient sample size (McNeish & Stapleton, 2016; Moineddin et al., 2007; Preacher et al., 2011; Wang et al., 2008). According to Swaminathan, Rogers and Sen (2011) in multilevel modelling the number of clusters has a higher importance compared to the individual observations within the cluster. Research by Maas and Hox (2005) and Paccagnella (2011) indicate that in order to do a successful multilevel regression, a sample with more than 50 clusters is a necessity. The 50 clusters are needed to be able to estimate the correct standard errors. Additionally, Schoeneberger (2016) suggests that when conducting 'regular' causal effects in a multilevel model, one needs a minimum of 50 clusters and 40 individual observations to be able to estimate the actual effects in the coefficients. In order to be able to estimate the true cross-level interaction effects in a multilevel model, one needs 100 clusters and 80 individual observations. These sample size problems are also addressed by Ali et al., (2019). They suggest that there should even be 120 clusters and 70 individual observations to estimate the correct interaction effect. If the sample sizes are smaller than the suggested size, it can induce type one errors where you can falsely reject the null hypothesis (Moineddin et al., 2007). Type one errors can lead to false conclusions (Sommet & Morselli, 2017). Therefore, an important limitation of this research is the shortage of level-2 data units in the data set. In my research, the available data only allows to include 50 clusters in the research. I still think it is important, especially in the context of the gender gap in entrepreneurship, to account for multiple levels of data. This is also because the ICC suggests significant variation between clusters, which means that observations can be interdependent in a single level model. Therefore, using a single level model could violate the important assumption of independence of residuals (Bressoux, 2010). Thus, I perceive it is crucial to use multilevel modelling. A suggestion for further research can be to run a Monte

Carlo simulation which can detect bias in the estimated effects and standard errors (Muthén & Muthén, 2002; Sommet & Morselli, 2017).

Additionally, the sample of countries that is provided by the GEM is not as diverse as one would wish for. A very large percentage of the countries that are surveyed are countries from the European (40%) or the American continent (24%). Although the sample consists of a large variation of developed and developing countries, the variety of the sample could be improved by using a more diverse spread of the continents. For now, participants from Asian or African countries are underrepresented in the sample. However, these are the largest continents with the highest population (National Geographic, 2022). The lack of diversity in the sample limits in forming an inclusive conclusion. Therefore, for future research, I advise to use a more representative sample of the world population, if available, when trying to do cross-country research.

An additional limitation of this research is that governmental institutions are very hard to measure with just a singular indicator. Chowdhury et al., (2018) have partly covered the problem by using multiple indicators to measure a single institution, and used it to estimate their effect on entrepreneurial activity. However, it is only a part of the solution since some institutions have more than 3 of 4 dimensions which makes it impossible to create an indicator that captures all aspects of the governmental institution. An example is the regulatory burden that comes with setting up a business. In this research I measure the regulatory burden through the amount steps one has to take in order to set up their business. This measure excludes to measure how complicated the steps are, and if there is narrow monitoring by the government to make sure no steps are disregarded. Additionally, regulations can also be sector specific, which is also not included in the measure. It is only an example to indicate that it is very hard to measure the true indication of an institution. It limits to estimate the true interaction coefficient for each governmental institution with gender. For further research it might be interesting to dive deeper in each institution and try to capture a more complete effect by using compounded variables.

It is also the case that differences among countries can lead to different causal effects (Gwartney, 2009). Differences in education levels, returns on investment and strictness of rules across countries can indicate that the measures for governmental institutions are not very uniform. This imposes a limitation in collapsing the results of different countries in order to estimate the real cross-country effect of governmental institutions on the gender gap in entrepreneurial activity. For future research one could attempt to construct uniform variables that give a weighted indication for each country to eliminate differences in variables across countries.

As previously discussed, most of the individual level control variables are perceived to be in a mechanism with gender, thus are 'bad' controls (Angrist & Pischke, 2019; Lucifora,

2015). When comparing table 2 and 3 and Appendix P tables 19 and 20, results of the interaction effects do not differ between including or excluding these so-called bad controls. However, the fact that gender is very likely to impact most of the demographic, factors such as education but also the perceptual factors of the entrepreneurial environment, limits to include these controls to form an unbiased estimation. This makes it impossible to include individual level control variables in the model to control for individual differences.

Lastly, since the individual level data is primarily based on a conducted survey, it is possible that these datapoints contain errors or biases (Tellis & Chandrasekaran, 2010). The respondents can misinterpret questions or can answer untruthfully which can introduce bias into the results.

I think that it is important that we use the insights that I collect from this research as a base to improve the contextual conditions that female entrepreneurs can benefit from. Being aware of the contributions the government can make to accelerate the rise of women in entrepreneurship will help to close the so undesirable gender gap in the future, and may provide more equal chances for both men and women to succeed as an entrepreneur.

## References

- Abdul Mutalib, R., Arshad, R., Ismail, N. S., & Ahmad, Z. (2019). Women and Entrepreneurship: An Overview of Women Entrepreneurship Programs in Malaysia | Journal of Governance and Development. *Journal of Governance and Development*, 11, 15–28.
- Acs, Z. J., & Szerb, L. (2006). Entrepreneurship, Economic Growth and Public Policy. *Small Business Economics* 28:2, 28(2), 109–122.
- Ahl, H. (2006). Why Research on Women Entrepreneurs Needs New Directions. *Entrepreneurship Theory and Practice*, 30(5), 595–621.
- Ahmad, N., & Seymour, R. (2008). Defining Entrepreneurial Activity: Definitions Supporting Frameworks for Data Collection. *SSRN Electronic Journal*.
- Ahmed, T., Chandran, V. G. R., & Klobas, J. E. (2017). Demographic differences in learner response to entrepreneurial education programmes in Pakistan. *Educational Studies*, 43(4), 464-483.
- Ai, C., & Norton, E. C. (2003). Interaction terms in logit and probit models. *Economics Letters*, 80(1), 123–129.
- Aidis, R., Estrin, S., & Mickiewicz, T. M. (2012). Size matters: Entrepreneurial entry and government. *Small Business Economics*, 39(1), 119–139.
- Akehurst, G., Simarro, E., & Mas-Tur, A. (2012). Women entrepreneurship in small service firms: motivations, barriers and performance. *The Service Industries Journal*, 32(15), 2489–2505.
- Alesina, A., & Wacziarg, R. (1998). Openness, country size and government. *Journal of Public Economics*, 69(3), 305–321.
- Ali, A., Ali, S., Khan, S. A., Khan, D. M., Abbas, K., Khalil, A., Manzoor, S., & Khalil, U. (2019). Sample size issues in multilevel logistic regression models. *PLOS ONE*, 14(11)
- Allport, F. H., & Allport, G. W. (1921). Personality Traits: Their Classification and Measurement. *The Journal of Abnormal Psychology and Social Psychology*, 16(1), 6–40.
- Alvarez, C., Urbano, D., Coduras, A., & Ruiz-Navarro, J. (2011). Environmental conditions and entrepreneurial activity: A regional comparison in Spain. *Journal of Small Business and Enterprise Development*, 18(1), 120–140.
- Amit, R., & Muller, E. (1995). "PUSH" AND "PULL" ENTREPRENEURSHIP. *Journal of Small Business & Entrepreneurship*, 12(4), 64–80.
- Amorós, J. E. (2011). The Impact of Institutions on Entrepreneurship in Developing Countries. In *Entrepreneurship and Economic Development*. 166–186.
- Anderson, A. R., & Starnawska, M. (2008). Research Practices in Entrepreneurship. *The International Journal of Entrepreneurship and Innovation*, 9(4), 221–230.
- Andrews, D., Cadera Sánchez, A., & Johansson, Å. (2011). *Towards a Better Understanding of the Informal Economy*.
- Angrist, J. D., & Pischke, J.-S. (2019). Mostly Harmless Econometrics. *Mostly Harmless Econometrics*.
- Arabiyat, T. S., Mdanat, M., Haffar, M., Ghoneim, A., & Arabiyat, O. (2019). The influence of institutional and conducive aspects on entrepreneurial innovation: Evidence from GEM data. *Journal of Enterprise Information Management*, 32(3), 366–389.
- Arnold Lincove, J. (2008). Growth, Girls' Education, and Female Labor: A Longitudinal Analysis. *The Journal of Developing Areas*, 41(2), 45–68.
- Audet, J., & Couteret, P. (2012). Coaching the entrepreneur: Features and success factors. *Journal of Small Business and Enterprise Development*, 19(3), 515–531.
- Audretsch, D. B., Belitski, M., Chowdhury, F., & Desai, S. (2021). Necessity or opportunity? Government size, tax policy, corruption, and implications for entrepreneurship. *Small Business Economics*, 58(4), 2025–2042.
- Audretsch, D. B., & Thurik A Roy. (1998). The Knowledge Society, Entrepreneurship, and Unemployment. *University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship*.

- Avnimelech, G., Zelekha, Y., & Sharabi, E. (2014). The effect of corruption on entrepreneurship in developed vs non-developed countries. *International Journal of Entrepreneurial Behaviour and Research*, 20(3), 237–262.
- Balachandra, L., Briggs, T., Eddleston, K., & Brush, C. (2019). Don't Pitch Like a Girl!: How Gender Stereotypes Influence Investor Decisions. *Entrepreneurship Theory and Practice*, 43(1), 116–137.
- Bárcena-Martín, E., Medina-Claros, S., & Pérez-Moreno, S. (2021). Economic Gender gap in the Global South: How Public Institutions Matter. *Social Indicators Research*, 158(2), 459–483.
- Barinova, V., Zemtsov, S., Tsareva, Y., Barinova, V. A., Tsareva, Y. v, & Zemtsov, S. P. (2018). Entrepreneurship and institutions: Does the relationship exist at the regional level in Russia? Clusters of SMEs in Russia View project Employment growth in SMEs in the regions of Russia View project Entrepreneurship and Institutions: Does the Relationship Exist at the Regional Level in Russia? *Voprosy Ekonomiki*, 6, 92–116.
- Barr, D. J., Levy, R., Scheepers, C., & Tily, H. J. (2013). Random effects structure for confirmatory hypothesis testing: Keep it maximal. *Journal of Memory and Language*, 68(3), 255–278.
- Bates, D., Kliegl, R., Vasishth, S., & Baayen, H. (2015). Parsimonious mixed models. *ArXiv Preprint*.
- Baughn, C. C., Chua, B., & Neupert, K. E. (2006). The Normative Context for Women's Participation in Entrepreneurship: A Multicountry Study. *Entrepreneurship Theory and Practice*, 30(5), 687–708.
- Baum, J. R., Frese, M., & Baron, R. A. (2014). *"Born to be an entrepreneur? Revisiting the personality approach to entrepreneurship."* The psychology of entrepreneurship. Psychology Pres.
- Baumol, W. J., & Strom, R. J. (2007). Entrepreneurship and economic growth. *Strategic Entrepreneurship Journal*, 1(3–4), 233–237.
- Bazkiaei, H. A., Heng, L. H., Khan, N. U., Saufi, R. B. A., & Kasim, R. S. R. (2020). Do entrepreneurial education and big-five personality traits predict entrepreneurial intention among universities students? *Cogent Business & Management*, 7(1), 1801217.
- Bergmann, H., Geissler, M., Hundt, C., & Grave, B. (2018). The climate for entrepreneurship at higher education institutions. *Research Policy*, 47(4), 700–716.
- Bergmann, H., & Stephan, U. (2013). Moving on from nascent entrepreneurship: measuring cross-national differences in the transition to new business ownership. *Small Business Economics*, 41(4), 945–959.
- Bernier, L., & Hafsi, T. (2007). The Changing Nature of Public Entrepreneurship. *Public Administration Review*, 67(3), 488–503.
- Best, H., & Wolf, C. (2013). *The SAGE Handbook of Regression Analysis and Causal Inference*. SAGE.
- Biraglia, A., & Kadile, V. (2017). The Role of Entrepreneurial Passion and Creativity in Developing Entrepreneurial Intentions: Insights from American Homebrewers. *Journal of Small Business Management*, 55(1), 170–188.
- Bird, B., & Brush, C. (2002). A Gendered Perspective on Organizational Creation. *Entrepreneurship Theory and Practice*, 26(3), 41–65.
- Blair, S. L., & Lichter, D. T. (1991). Measuring the Division of Household Labor. *Journal of Family Issues*, 12(1), 91–113.
- Bönte, W., & Piegeler, M. (2013). Gender gap in latent and nascent entrepreneurship: driven by competitiveness. *Small Business Economics*, 41(4), 961–987.
- Bosma, N., Content, J., Sanders, M., & Stam, E. (2018). Institutions, entrepreneurship, and economic growth in Europe. *Small Business Economics*, 51(2), 483–499.
- Bosma, N., & Schutjens, V. (2010). Understanding regional variation in entrepreneurial activity and entrepreneurial attitude in Europe. *The Annals of Regional Science* 2010 47:3, 47(3), 711–742.
- Boudreaux, C., & Nikolaev, B. (2018). Shattering the Glass Ceiling? How the Institutional Context Mitigates the Gender Gap in Entrepreneurship. *SSRN Electronic Journal*.



- Bradford DeLong, J., Summers, L. H., Baumol, W. J., Litan, R. E., Schramm, C. J., Desai, M. A., Fritz Foley, C., Barro, R., Bolnick, B., Chetty, R., Kotlikoff, L., la Porta, R., Simeon Djankov, B., Ganser, T., McLiesh, C., Ramalho, R., & Shleifer, A. (2010). The Effect of Corporate Taxes on Investment and Entrepreneurship. *American Economic Journal: Macroeconomics*, 2(3), 31–64.
- Bressoux, P. (2010). *Modélisation statistique appliquée aux sciences sociales*. De Boeck Supérieur.
- Brieger, S. A., & Gielnik, M. M. (2021). Understanding the gender gap in immigrant entrepreneurship: a multi-country study of immigrants' embeddedness in economic, social, and institutional contexts. *Small Business Economics*, 56(3), 1007–1031.
- Bruyat, C., & Julien, P.-A. (2001). Defining the field of research in entrepreneurship. *Journal of Business Venturing*, 16(2), 165–180.
- Buffart, M., Croidieu, G., Kim, P. H., & Bowman, R. (2020). Even winners need to learn: How government entrepreneurship programs can support innovative ventures. *Research Policy*, 49(10), 104052.
- Cacciotti, G., & Hayton, J. C. (2015). Fear and Entrepreneurship: A Review and Research Agenda. *International Journal of Management Reviews*, 17(2), 165–190.
- Carree, M. A., & Thurik, A. R. (2010). The Impact of Entrepreneurship on Economic Growth. *Handbook of Entrepreneurship Research*, 557–594.
- Castellaneta, F., Conti, R., & Kacperczyk, A. (2020). The (Un) intended consequences of institutions lowering barriers to entrepreneurship: The impact on female workers. *Strategic Management Journal*, 41(7), 1274–1304.
- Chambers, D., McLaughlin, P. A., & Stanley, L. (2019). Barriers to prosperity: the harmful impact of entry regulations on income inequality. *Public Choice*, 180(1–2), 165–190.
- Chambers, D., & Munemo, J. (2019). Regulations, institutional quality and entrepreneurship. *Journal of Regulatory Economics*, 55(1), 46–66.
- Cheah, C. (2009). Clustering Standard Errors or Modeling Multilevel Data? *University of Columbia*, 2–4. [www.bls.census.gov/cps/cpsmain.htm](http://www.bls.census.gov/cps/cpsmain.htm).
- Chen, M. A., & Alter, M. (2012). The Informal Economy: Definitions, Theories and Policies WIEGO Working Papers. *WIEGO*.
- Chowdhury, F., & Audretsch, D. B. (2014). Institution as looting apparatus: impact of gender equality and institutions on female entrepreneurship. *Eurasian Bus Rev*, 4, 207–225.
- Chowdhury, F., Audretsch, D. B., & Belitski, M. (2018). Institutions and Entrepreneurship Quality. *Journal of Business Venturing*, 33(1), 51–81.
- Chowdhury, F., Terjesen, S., & Audretsch, D. (2015). Varieties of entrepreneurship: institutional drivers across entrepreneurial activity and country. *European Journal of Law and Economics*, 40(1), 121–148.
- Daniels, M. J., Dominici, F., & Zeger, S. (2004). Underestimation of standard errors in multi-site time series studies. *Epidemiology*, 15(1), 57–62.
- Darnihamedani, P., Block, J. H., Hessels, J., & Simonyan, A. (2018). Taxes, start-up costs, and innovative entrepreneurship. *Small Business Economics*, 51(2), 355–369.
- Davidsson, P., & Honig, B. (2003). The role of social and human capital among nascent entrepreneurs. *Journal of Business Venturing*, 18(3), 301–331.
- Deger, S. (1985). Human Resources, Government Education Expenditure, and the Military Burden in Less Developed Countries. *The Journal of Developing Areas*, 20(1), 37–48.
- DeMartino, R., & Barbato, R. (2003). Differences between women and men MBA entrepreneurs: exploring family flexibility and wealth creation as career motivators. *Journal of Business Venturing*, 18(6), 815–832.
- Dheer, R. J. S., Li, M., & Treviño, L. J. (2019). An integrative approach to the gender gap in entrepreneurship across nations. *Journal of World Business*, 54(6), 101004.
- Diandra, D., & Azmy, A. (2020). Understanding Definition of Entrepreneurship. *Article in Journal of Management Accounting and Economics*.
- Díaz-García, M. C., & Jiménez-Moreno, J. (2010). Entrepreneurial intention: the role of gender. *International Entrepreneurship and Management Journal*, 6(3), 261–283.

- Dowding, K. M., & Kimber, R. (1983). The Meaning and Use of 'Political Stability'\*. *European Journal of Political Research*, 11(3), 229–243.
- Dutta, N., S. Sobel, R., & Roy, S. (2013). Entrepreneurship and political risk. *Journal of Entrepreneurship and Public Policy*, 2(2), 130–143.
- Dutta, N., & Sobel, R. (2016). Does corruption ever help entrepreneurship? *Small Business Economics*, 47(1), 179–199.
- Ehrlich, I., & Francis, T. L. (2015). Bureaucratic Corruption and Endogenous Economic Growth. *Journal of Political Economy*, 107(S6), S270-S293.
- Ellemers, N. (2018). Gender Stereotypes. *Annual Review of Psychology*, 69(1), 275–298.
- Engle, P. L. (1997). The role of men in families: Achieving gender equity and supporting children. *Gender & Development*, 5(2), 31–40.
- Estrin, S., & Mickiewicz, T. (2011). Institutions and female entrepreneurship. *Small Business Economics*, 37(4), 397–415.
- Estrin, S., Mickiewicz, T., & Stephan, U. (2013). Entrepreneurship, social capital, and institutions: Social and commercial entrepreneurship across nations. *Entrepreneurship theory and practice*, 37(3), 479-504.
- Farooq, O., Satt, H., & Ramid, S. (2019). Gender difference and informal competition: evidence from India. *Journal of Small Business and Enterprise Development*, 26(1), 2–17.
- Field, E., Jayachandran, S., & Pande, R. (2010). Do Traditional Institutions Constrain Female Entrepreneurship? A Field Experiment on Business Training in India. *American Economic Review*, 100(2), 125–129.
- Fonchingong, C. C. (2005). Negotiating livelihoods beyond Beijing: the burden of women food vendors in the informal economy of Limbe, Cameroon\*. *International Social Science Journal*, 57(184), 243–253.
- Friedman, M. (1955). *The Role of Government in Education* \*.
- Gartner, W. B. (1990). What are we talking about when we talk about entrepreneurship? *Journal of Business Venturing*, 5, 15–28.
- Gawel, A. (2021). The gender-based attainment of education and female entrepreneurship: the European perspective. *Entrepreneurship and Sustainability Issues*, 8(4), 403–417.
- GEM. (2017). *GEM Global Entrepreneurship Monitor Definitions*. Global Entrepreneurship Monitor. Retrieved June 16, 2022, from <https://www.gemconsortium.org/wiki/1154>.
- General Entrepreneurship Monitor. (2020). *Entrepreneurial behaviour and attitudes*. General Entrepreneurship Monitor. Retrieved at April 5, 2022, from <https://www.gemconsortium.org/data>
- Giacomin, O., Janssen, F., Pruett, M., Shinnar, R. S., Llopis, F., & Toney, B. (2011). Entrepreneurial intentions, motivations and barriers: Differences among American, Asian and European students. *International Entrepreneurship and Management Journal*, 7(2), 219–238.
- Gilad, B., & Levine, P. (1986). A behavioral model of entrepreneurial supply. *Journal of Small Business Management*, 24(4), 45–53.
- Goel, R. K. (2018). Foreign direct investment and entrepreneurship: gender differences across international economic freedom and taxation. *Small Business Economics*, 50(4), 887–897.
- Goguen, J., & Roşu, G. (2002). Institution Morphisms. *Formal Aspects of Computing*, 13(3–5), 274–307.
- Gordon, A. D. (1996). *Null Models in Cluster Validation*. 32–44.
- Graf Lambsdorff, J. (2003). How Corruption Affects Productivity. *KYKLOS*, 56, 457–474.
- Greene, W. (2010). Testing hypotheses about interaction terms in nonlinear models. *Economics Letters*, 107(2), 291–296.
- Guzman, J., & Kacperczyk, A. (Olenka). (2019). Gender gap in entrepreneurship. *Research Policy*, 48(7), 1666–1680.
- Gwartney, J. (2009). Institutions, Economic Freedom, and Cross-Country Differences in Performance. *Southern Economic Journal*, 75(4), 937–956.

- Hao Zhao, Seibert, S. E., & Lumpkin, G. T. (2010). The Relationship of Personality to Entrepreneurial Intentions and Performance: A Meta-Analytic Review. *Journal of Management*, 36(2), 381–404.
- Hasan, S. M., Khan, E. A., & Nabi, M. N. U. (2017). Entrepreneurial education at university level and entrepreneurship development. *Education and Training*, 59(7–8), 888–906.
- Heck, R. H. (2013). *Multilevel and Longitudinal Modeling with IBM SPSS*. Routledge.
- Heilbrunn, S. (2004). Impact of gender on difficulties faced by entrepreneurs. *The International Journal of Entrepreneurship and Innovation*, 5(3), 159–165.
- Heilman, M. E. (2012). Gender stereotypes and workplace bias. *Research in Organizational Behavior*, 32, 113–135.
- Hendratmi, A., & Sukmaningrum, P. S. (2018). Role of government support and incubator organization to success behaviour of woman entrepreneur : Indonesia Women Entrepreneur Association. *Polish Journal of Management Studies*, Vol. 17, No. 1(1), 105–115.
- Henrekson, M., & Sanandaji, T. (2011). The interaction of entrepreneurship and institutions. *Journal of Institutional Economics*, 7(1), 47–75.
- Henrekson, M., & Stenkula, M. (2010). Entrepreneurship and Public Policy. *Handbook of Entrepreneurship Research*, 595–637.
- Henry, C. (2013). Entrepreneurship education in HE: Are policy makers expecting too much? *Education and Training*, 55(8–9), 836–848.
- Hessels, J., & van Stel, A. (2011). Entrepreneurship, export orientation, and economic growth. *Small Business Economics*, 37(2), 255–268.
- Higgins, D., & Elliott, C. (2011). Learning to make sense: What works in entrepreneurial education? *Journal of European Industrial Training*, 35(4), 345–367.
- Hisrich, R. D. (1986). The Woman Entrepreneur: A Comparative Analysis. *Leadership & Organization Development Journal*, 7(2), 8–16.
- Historiek. (2021, March 15). Vrouwen tot 1956 handelingsonbekwaam. Retrieved June 27, 2022, from <https://historiek.net/vrouwen-tot-1956-handelingsonbekwaam/15127/>
- Hodgson, G. M. (2006). What Are Institutions? *Journal of Economic Issues*, 40(1), 1–25.
- Hunady, J., Orviska, M., & Pizar, P. (2018). The Effect of Higher Education on Entrepreneurial Activities and Starting Up Successful Businesses. *Engineering Economics*, 29(2), 226–235.
- Iakovleva, T., Solesvik, M., & Trifilova, A. (2013). Financial availability and government support for women entrepreneurs in transitional economies: Cases of Russia and Ukraine. *Journal of Small Business and Enterprise Development*, 20(2), 314–340.
- Ilie, C., Monfort, A., Fornes, G., & Cardoza, G. (2021). Promoting Female Entrepreneurship: The Impact of Gender Gap Beliefs and Perceptions. *SAGE Open*, 11(2), 215824402110184.
- Jennings, J. E., & Brush, C. G. (2013). Research on women entrepreneurs: challenges to (and from) the broader entrepreneurship literature?. *Academy of Management Annals*, 7(1), 663–715..
- Johansen, V. (2010). Entrepreneurship education and entrepreneurial activity. *International Journal of Entrepreneurship and Small Business*, 9(1), 74–85.
- Kamleitner, B., Korunka, C., & Kirchler, E. (2012). Tax compliance of small business owners: A review. *International Journal of Entrepreneurial Behaviour and Research*, 18(3), 330–351.
- Kan, K., & Tsai, W.-D. (2006). Entrepreneurship and Risk Aversion. *Small Business Economics*, 26(5), 465–474.
- Karaca-Mandic, P., Norton, E. C., & Dowd, B. (2012). Interaction Terms in Nonlinear Models. *Health Services Research*, 47(1pt1), 255–274.
- Kautonen, T., van Gelderen, M., & Fink, M. (2015). Robustness of the Theory of Planned Behavior in Predicting Entrepreneurial Intentions and Actions. *Entrepreneurship Theory and Practice*, 39(3), 655–674.
- Kay, R., & Little, S. (1987). Transformations of the explanatory variables in the logistic regression model for binary data. *Biometrika*, 74(3), 495–501.

- Kim, J. H. (2019). Multicollinearity and misleading statistical results. *Korean Journal of Anesthesiology*, 72(6), 558.
- Klapper, L. F., & Parker, S. C. (2011). Gender and the Business Environment for New Firm Creation. *The World Bank Research Observer*, 26(2), 237–257.
- Klapper, L., Laeven, L., & Rajan, R. (2006). Entry regulation as a barrier to entrepreneurship. *Journal of Financial Economics*, 82(3), 591–629.
- Kobeissi, N. (2010). Gender factors and female entrepreneurship: International evidence and policy implications. *Journal of International Entrepreneurship*, 8(1), 1–35.
- Kobia, M., & Sikalieh, D. (2010). Towards a search for the meaning of entrepreneurship. *Journal of European Industrial Training*, 34(2), 110–127.
- Koellinger, P., Minniti, M., & Schade, C. (2013). Gender Differences in Entrepreneurial Propensity\*. *Oxford Bulletin of Economics and Statistics*, 75(2), 213–234.
- Kolasinski, A. C., & Siegel, A. F. (2010). On the Economic Meaning of Interaction Term Coefficients in Non-Linear Binary Response Regression Models. *SSRN Electronic Journal*.
- Kolstad, I., & Wiig, A. (2015). Education and entrepreneurial success. *Small Business Economics*, 44(4), 783–796.
- Kurtz, M., & Schrank, A. (2021). The Social Construction of the Regulatory Burden: Methodological and Substantive Considerations. *Social Forces*, 99(3), 1013–1035.
- Kus, B. (2010). Regulatory governance and the informal economy: cross-national comparisons. *Socio-Economic Review*, 8(3), 487–510.
- Lee, H. J. (2019). What Factors Are Necessary for Sustaining Entrepreneurship? *Sustainability 2019, Vol. 11, Page 3022, 11(11), 3022*.
- Lee, S. H., Yamakawa, Y., Peng, M. W., & Barney, J. B. (2011). How do bankruptcy laws affect entrepreneurship development around the world? *Journal of Business Venturing*, 26(5), 505–520.
- Lee, Y., & Gordon, R. H. (2005). Tax structure and economic growth. *Journal of Public Economics*, 89(5–6), 1027–1043.
- Leutner, F., Ahmetoglu, G., Akhtar, R., & Chamorro-Premuzic, T. (2014). The relationship between the entrepreneurial personality and the Big Five personality traits. *Personality and Individual Differences*, 63, 58–63.
- Levie, J., & Autio, E. (2011). Regulatory Burden, Rule of Law, and Entry of Strategic Entrepreneurs: An International Panel Study. *Journal of Management Studies*, 48(6), 1392–1419.
- Levin, H. M., Belfield, C., Muennig, P., & Rouse, C. (2007). The public returns to public educational investments in African-American males. *Economics of Education Review*, 26(6), 699–708.
- Levine, R., & Rubinstein, Y. (2017). Smart and Illicit: Who Becomes an Entrepreneur and Do They Earn More? *The Quarterly Journal of Economics*, 132(2), 963–1018.
- Liang, J., Wang, H., & Lazear, E. P. (2018). Demographics and Entrepreneurship. *Journal of Political Economy*, 126(S1), S140–S196.
- Library of Congress. (2021). *Voting Rights for Women | The Right to Vote | Elections | Classroom Materials at the Library of Congress | Library of Congress*. Retrieved at January 30, 2022, from <https://www.loc.gov/classroom-materials/elections/right-to-vote/voting-rights-for-women/>
- Littunen, H. (2000). Entrepreneurship and the characteristics of the entrepreneurial personality. *International Journal of Entrepreneurial Behavior & Research*, 6(6), 295–310.
- Llusa, F. (2010). Determinants of Entrepreneurship: Are Women Different? *SSRN*.
- Lucifora, C. (2015). Angrist, Joshua D. & Pischke, Jörn-Steffen: Mastering 'metrics: The path from cause to effect. *Journal of Economics*, 116(2), 179–181.
- Maas, C. J. M., & Hox, J. J. (2005). Sufficient Sample Sizes for Multilevel Modeling. *Methodology*, 1(3), 86–92.
- Madrick, J. (2010). The Case for Big Government.

- Maes, J., Leroy, H., & Sels, L. (2014). Gender differences in entrepreneurial intentions: A TPB multi-group analysis at factor and indicator level. *European Management Journal*, 32(5), 784–794.
- Mansfield, E. R., & Helms, B. P. (1982). Detecting multicollinearity. *The American Statistician*, 36(3a), 158-160.
- Markussen, S., & Røed, K. (2017). The gender gap in entrepreneurship – The role of peer effects. *Journal of Economic Behavior & Organization*, 134, 356–373.
- McKernan, S. M. (2002). The Impact of Microcredit Programs on Self-Employment Profits: Do Noncredit Program Aspects Matter? *The Review of Economics and Statistics*, 84(1), 93–115.
- McNeish, D. M., & Stapleton, L. M. (2016). The Effect of Small Sample Size on Two-Level Model Estimates: A Review and Illustration. *Educational Psychology Review*, 28(2), 295–314.
- Meyer, N. (2015). Poor People’s Perceptions of Government Support for Entrepreneurship and Small Business Promotion in a Developing Country. *Journal of Economics and Behavioral Studies*, 7(6(J)), 6–12.
- Millán, J. M., Congregado, E., Román, C., van Praag, M., & van Stel, A. (2014). The value of an educated population for an individual’s entrepreneurship success. *Journal of Business Venturing*, 29(5), 612–632.
- Minniti, M. (2009). Gender issues in entrepreneurship. *Foundations and Trends® in Entrepreneurship*, 5(7–8), 497-621.
- Minniti, M., & Arenius, P. (2003, April). Women in entrepreneurship. In *The entrepreneurial advantage of nations: First annual global entrepreneurship symposium* (Vol. 29). United Nations.
- Miranda, F. J., Chamorro-Mera, A., Rubio, S., & Pérez-Mayo, J. (2017). Academic entrepreneurial intention: the role of gender. *International Journal of Gender and Entrepreneurship*, 9(1), 66–86.
- Moehring, K. (2021). *The fixed effects approach as an alternative to multilevel analysis for cross-national analyses*.
- Mohammadi Khyareh, M. (2017). Institutions and entrepreneurship: the mediating role of corruption. *World Journal of Entrepreneurship, Management and Sustainable Development*, 13(3), 262–282.
- Moineddin, R., Matheson, F. I., & Glazier, R. H. (2007a). A simulation study of sample size for multilevel logistic regression models. *BMC Medical Research Methodology*, 7(1), 1–10.
- Moineddin, R., Matheson, F. I., & Glazier, R. H. (2007b). A simulation study of sample size for multilevel logistic regression models. *BMC Medical Research Methodology*, 7(1), 34.
- Mok, K. H. (2005). Fostering entrepreneurship: Changing role of government and higher education governance in Hong Kong. *Research Policy*, 34(4), 537–554.
- Mueller, S. (2004). Gender Gaps in Potential for Entrepreneurship Across Countries and Cultures. *Journal of Developmental Entrepreneurship*, 9(3), 199–220.
- Mueller, S. L., & Thomas, A. S. (2001). Culture and entrepreneurial potential. *Journal of Business Venturing*, 16(1), 51–75.
- Munemo, J. (2012). Entrepreneurship in developing countries: is Africa different?. *Journal of Developmental Entrepreneurship*, 17(01), 1250004.
- Murphy, K., Shleifer, A., & Vishny, R. W. (1993). Why Is Rent-Seeking So Costly to Growth? *The American Economic Review*, 83(2), 409–414
- Musa, B. M., & Semasinghe, D. M. (2013). Entrepreneurship and unemployment: A literature review. In *International conference on business & information*. 2.
- Muthén, L. K., & Muthén, B. O. (2002). How to Use a Monte Carlo Study to Decide on Sample Size and Determine Power. *Structural Equation Modeling: A Multidisciplinary Journal*, 9(4), 599–620.
- National Geographic. (2022). *Continent | National Geographic Society*. Retrieved at 30 May, 2022, from <https://education.nationalgeographic.org/resource/Continent>

- Naudé, W. (2013). Entrepreneurship and Economic Development: Theory, Evidence and Policy. *SSRN Electronic Journal*.
- Navarro-García, A. (2016). Drivers of export entrepreneurship. *International Business Review*, 25(1), 244–254.
- Neneh, B. N. (2019). From entrepreneurial alertness to entrepreneurial behavior: The role of trait competitiveness and proactive personality. *Personality and Individual Differences*, 138, 273–279.
- Noguera, M., Alvarez, C., Merigó, J. M., & Urbano, D. (2015). Determinants of female entrepreneurship in Spain: an institutional approach. *Computational and Mathematical Organization Theory*, 21(4), 341–355.
- Norton, E. C., Wang, H., & Ai, C. (2004). Computing Interaction Effects and Standard Errors in Logit and Probit Models. *The Stata Journal: Promoting Communications on Statistics and Stata*, 4(2), 154–167.
- Obaji, N. O. (2014). The Role of Government Policy in Entrepreneurship Development. *Science Journal of Business and Management*, 2(4), 109.
- Obschonka, M., Schmitt-Rodermund, E., & Terracciano, A. (2014). Personality and the Gender Gap in Self-Employment: A Multi-Nation Study. *PLoS ONE*, 9(8), e103805.
- Obschonka, M., Silbereisen, R. K., & Schmitt-Rodermund, E. (2012). Explaining Entrepreneurial Behavior: Dispositional Personality Traits, Growth of Personal Entrepreneurial Resources, and Business Idea Generation. *The Career Development Quarterly*, 60(2), 178–190.
- OECD. (2016). *Data - OECD*. Retrieved at 4 February, 2022, from <https://www.oecd.org/gender/data/gender-gap-in-entrepreneurship-and-entrepreneurial-risk.htm>
- OECD. (2022). *OECD Labour Force Statistics 2021*.
- Oosterbeek, H., van Praag, M., & Ijsselstein, A. (2010). The impact of entrepreneurship education on entrepreneurship skills and motivation. *European Economic Review*, 54(3), 442–454.
- Paccagnella, O. (2011). Sample Size and Accuracy of Estimates in Multilevel Models. *Methodology*, 7(3), 111–120.
- Parker, S. (2007). Law and the economics of entrepreneurship. *Comparative Labor Law and Policy Journal*, 28, 695–716.
- Parker, S. (2009). *The economics of entrepreneurship*. Cambridge UK: Cambridge University Press.
- Parker, S. C., & Van Praag, C. M. (2006). Schooling, capital constraints, and entrepreneurial performance: The endogenous triangle. *Journal of Business & Economic Statistics*, 24(4), 416–431.
- Pekkarinen, T. (2012). Gender differences in education. *NOrdic Economic Policy Review*, 1(1), 165–194.
- Pellis, L., Franssen-Van Hal, N. L. W., Burema, J., & Keijer, J. (2004). The intraclass correlation coefficient applied for evaluation of data correction, labeling methods, and rectal biopsy sampling in DNA microarray experiments. *Physiological Genomics*, 16, 99–106.
- Piva, E., & Rovelli, P. (2021). Mind the gender gap: the impact of university education on the entrepreneurial entry of female and male STEM graduates. *Small Business Economics*, 1–19.
- Porter, M. E. (1980). Industry Structure and Competitive Strategy: Keys to Profitability. *Financial Analysts Journal*, 36(4), 30–41.
- Poterba, J. M. (1996). 10 Government Intervention in the Markets for Education and Health Care: How and Why?. *Individual and social responsibility*, 277.
- Poulson, B. W., & Kaplan, J. G. (2008). State Income Taxes and Economic Growth. *Cato Journal*, 28.
- Powell, G. N., & Eddleston, K. A. (2013). Linking family-to-business enrichment and support to entrepreneurial success: Do female and male entrepreneurs experience different outcomes? *Journal of Business Venturing*, 28(2), 261–280.

- Preacher, K. J., Zhang, Z., & Zyphur, M. J. (2011). Alternative methods for assessing mediation in multilevel data: The advantages of multilevel SEM. *Structural equation modeling, 18*(2), 161-182.
- Psacharopoulos, G., & Patrinos\*, H. A. (2004). Returns to investment in education: a further update. *Education economics, 12*(2), 111-134.
- Puffer, S. M., McCarthy, D. J., & Boisot, M. (2010). Entrepreneurship in Russia and China: The impact of formal institutional voids. *Entrepreneurship theory and practice, 34*(3), 441-467.
- Queen's Printer of Acts of Parliament. (1882). *Married Women's Property Act 1882*. Legislation.Gov.Uk. Retrieved at 6 February, 2022, from <https://www.legislation.gov.uk/ukpga/Vict/45-46/75/enacted>
- Ramos, V. F. M. L., Esquenazi, A., Villegas, M. A. F., Wu, T., & Hallett, M. (2016). Temporal discrimination threshold with healthy aging. *Neurobiology of Aging, 43*, 174–179.
- Raposo, M., & do Paço, A. (2010). Special issue: entrepreneurship and education—links between education and entrepreneurial activity. *International Entrepreneurship and Management Journal 2010 7:2, 7*(2), 143–144.
- Rauch, A., Zhao, X., & Li, H. (2012). Cross-Country Differences in Entrepreneurial Activity: The Role of Cultural Practice and National Wealth. *Frontiers of Business Research in China, 6*(4), 447–474.
- Reed, W. R. (2015). On the Practice of Lagging Variables to Avoid Simultaneity. *Oxford Bulletin of Economics and Statistics, 77*(6), 897–905.
- Remeikiene, R., Startiene, G., & Dumciuviene, D. (2013, June). Explaining entrepreneurial intention of university students: The role of entrepreneurial education. In *International conference*(Vol. 299, p. 307).
- Ribeiro-Soriano, D., & Galindo-Martín, M. Á. (2012). Government policies to support entrepreneurship. *Entrepreneurship & Regional Development, 24*(9-10), 861-864.
- Rodríguez-Pose, A. (2013). Do institutions matter for regional development?. *Regional studies, 47*(7), 1034-1047.
- Sachs, J. D., & Warner, A. M. (2001). The curse of natural resources. *European Economic Review, 45*(4–6), 827–838.
- Sánchez, J. C. (2013). The impact of an entrepreneurship education program on entrepreneurial competencies and intention. *Journal of Small Business Management, 51*(3), 447–465.
- Santos, F. J., Roomi, M. A., & Liñán, F. (2016). About Gender Differences and the Social Environment in the Development of Entrepreneurial Intentions. *Journal of Small Business Management, 54*(1), 49–66.
- Schoeneberger, J. A. (2016). The Impact of Sample Size and Other Factors When Estimating Multilevel Logistic Models. *The Journal of Experimental Education, 84*(2), 373–397.
- Shinnar, R. S., Hsu, D. K., Powell, B. C., & Zhou, H. (2018). Entrepreneurial intentions and start-ups: Are women or men more likely to enact their intentions? *International Small Business Journal: Researching Entrepreneurship, 36*(1), 60–80.
- Shleifer, A., & Vishny, R. W. (1993). Corruption. *The Quarterly Journal of Economics, 108*(3), 599–617.
- Slack, M. K., & Draugalis, J. L. R. (2001). Establishing the internal and external validity of experimental studies. *American Journal of Health-System Pharmacy, 58*(22), 2173–2181.
- Smith, R. M., Sardeshmukh, S. R., & Combs, G. M. (2016). Understanding gender, creativity, and entrepreneurial intentions. *Education + Training, 58*(3), 263–282.
- Sommet, N., & Morselli, D. (2017). Keep calm and learn multilevel logistic modeling: A simplified three-step procedure using stata, R, Mplus, and SPSS. *International Review of Social Psychology, 30*(1), 203–218.
- Sowmya, D. V., Majumdar, S., & Gallant, M. (2010). Relevance of education for potential entrepreneurs: An international investigation. *Journal of Small Business and Enterprise Development, 17*(4), 626–640.

- Spencer, J. W., & Gómez, C. (2004). The relationship among national institutional structures, economic factors, and domestic entrepreneurial activity: a multicountry study. *Journal of Business Research*, 57(10), 1098–1107.
- Statnik, J. C., Vu, T. L. G., & Weill, L. (2022). Does Corruption Discourage More Female Entrepreneurs from Applying for Credit? *Comparative Economic Studies*, 1–28.
- Stephen, F. H., Urbano, D., & van Hemmen, S. (2005). The impact of institutions on entrepreneurial activity. *Managerial and Decision Economics*, 26(7), 413–419.
- Sternberg, R. (2014). Success factors of university-spin-offs: Regional government support programs versus regional environment. *Technovation*, 34(3), 137–148.
- Stevenson, H. (1983). *A perspective on entrepreneurship* (Vol. 13). Harvard Business School.
- St-Jean, E., & Audet, J. (2012). The role of mentoring in the learning development of the novice entrepreneur. *International Entrepreneurship and Management Journal*, 8(1), 119–140.
- Stoltzfus, G., Nibbelink, B. L., Vredenburg, D., & Hyrum, E. (2011). Gender, Gender Role, and Creativity. *Social Behavior and Personality: An International Journal*, 39(3), 425–432.
- Storey, D. J. (1994). New firm growth and bank financing. *Small Business Economics*, 6(2), 139–150.
- Sudbury, J. (2005). *Global Lockdown: Race, Gender, and the Prison-industrial Complex*. Routledge. [https://books.google.nl/books?hl=nl&lr=&id=7M-3haicFa0C&oi=fnd&pg=PA109&dq=big+government&ots=Ftkp4bzXbB&sig=iTVT8W3NxbNq\\_HpjwKNw0w59814&redir\\_esc=y#v=onepage&q=big%20government&f=false](https://books.google.nl/books?hl=nl&lr=&id=7M-3haicFa0C&oi=fnd&pg=PA109&dq=big+government&ots=Ftkp4bzXbB&sig=iTVT8W3NxbNq_HpjwKNw0w59814&redir_esc=y#v=onepage&q=big%20government&f=false)
- Svelander, S. (2022). *About. IWEF Foundation*. IWEF .
- Swaminathan, H., Rogers, H. J., & Sen, R. (2011). *Research Methodology for Decision-Making in School Psychology*. Oxford University Press.
- Sweida, G. L., & Reichard, R. J. (2013). Gender stereotyping effects on entrepreneurial self-efficacy and high-growth entrepreneurial intention. *Journal of Small Business and Enterprise Development*, 20(2), 296–313.
- Świątkowski, W., & Dompnier, B. (2017). Replicability Crisis in Social Psychology: Looking at the Past to Find New Pathways for the Future. *International Review of Social Psychology*, 30(1), 111.
- Taatila, V. P. (2010). Learning entrepreneurship in higher education. *Education and Training*, 52(1), 48–61.
- Taniguchi, H. (2002). Determinants of Women's Entry into Self-Employment. *Social Science Quarterly*, 83(3),
- Tax Index. (2017). *Tax Attractiveness Index*. Retrieved at 15 May, 2022, from <https://www.tax-index.org/>
- Tellis, G. J., & Chandrasekaran, D. (2010). Extent and impact of response biases in cross-national survey research. *International Journal of Research in Marketing*, 27(4), 329–341.
- Thaler, R. H. (1999). Mental Accounting Matters. *Journal of Behavioral Decision Making*, 12(3), 183–206.
- The Global Economy. (2017). *Political stability by country, around the world | TheGlobalEconomy.com*. Retrieved at 15 May, 2022, from [https://www.theglobaleconomy.com/rankings/wb\\_political\\_stability/](https://www.theglobaleconomy.com/rankings/wb_political_stability/)
- The World Bank. (2019). *Women, Business and the Law - Gender Equality, Women Economic Empowerment - World Bank Group*. Retrieved at 30 March, 2022, from <https://wbi-worldbank-org.eur.idm.oclc.org/en/wbi>
- The World Data Bank. (2017). *Indicators | Data*. The World Data Bank. Retrieved at 30 March, 2022, from <https://data-worldbank-org.eur.idm.oclc.org/indicator>
- The World Data Bank. (2022). *About us | Data*. The World Data Bank. Retrieved at 29 April, 2022, from <https://data-worldbank-org.eur.idm.oclc.org/about>
- Thébaud, S. (2010). Masculinity, Bargaining, and Breadwinning. *Gender & Society*, 24(3), 330–354.



- Thébaud, S. (2015). Business as Plan B. *Administrative Science Quarterly*, 60(4), 671–711.
- Thompson, P., Jones-Evans, D., & Kwong, C. C. Y. (2010). Education and entrepreneurial activity: A comparison of White and South Asian Men. *International Small Business Journal: Researching Entrepreneurship*, 28(2), 147–162.
- Transparency International. (2017). *2017 Corruption Perceptions Index*. Transparency International. Retrieved at 29 April, 2022, from <https://www.transparency.org/en/cpi/2017>
- Trevelyan, R. (2008a). Optimism, overconfidence and entrepreneurial activity. *Management Decision*, 46(7), 986–1001.
- Trevelyan, R. (2008b). Optimism, overconfidence and entrepreneurial activity. *Management Decision*, 46(7), 986–1001.
- Trostel, P. A. (2005). Nonlinearity in the return to education. *Journal of Applied Economics*, 8(1), 191–202.
- Tur-Porcar, A., Mas-Tur, A., & Belso, J. A. (2017). Barriers to women entrepreneurship. Different methods, different results? *Quality & Quantity*, 51(5), 2019–2034.
- Ughetto, E., Rossi, M., Audretsch, D., & Lehmann, E. E. (2020). Female entrepreneurship in the digital era. *Small Business Economics*, 55(8), 305–312.
- Urbano, D., & Alvarez, C. (2014). Institutional dimensions and entrepreneurial activity: An international study. *Small Business Economics*, 42(4), 703–716.
- van Bavel, J., Schwartz, C. R., & Esteve, A. (2018). The Reversal of the Gender Gap in Education and Its Consequences for Family Life. *Annual Review of Sociology*, 44, 341–360.
- Velilla, J., Molina Chueca, J. A., & Ortega, R. (2021). Entrepreneurship Among Low-, Mid- and High-Income Workers in South America: A Fuzzy-Set Analysis. *SSRN Electronic Journal*.
- Venâncio, A., Barros, V., & Raposo, C. (2022). Corporate taxes and high-quality entrepreneurship. *Small Business Economics*, 58(1), 353–382.
- Verheul, I., Wennekers, S., Audretsch, D., & Thurik, R. (2002). *An of Entrepreneurship: Policies, Institutions and Culture*. 11–81.
- Viviano, E. (2008). Entry regulations and labour market outcomes: Evidence from the Italian retail trade sector. *Labour Economics*, 15(6), 1200–1222.
- Voigt, S. (2018). How to measure informal institutions. *Journal of Institutional Economics*, 14(1), 1–22.
- Vossenbergh, S. (2013). Women Entrepreneurship Promotion in Developing Countries: What explains the gender gap in entrepreneurship and h. *Maastricht School of Management Working Paper Series*, 8(1), 1–27.
- Vossenbergh, S. (2013). Women Entrepreneurship Promotion in Developing Countries: What explains the gender gap in entrepreneurship and h. *Maastricht School of Management Working Paper Series*, 8(1), 1–27.
- Wang, J., Li, Y., & Long, D. (2019). Gender gap in entrepreneurial growth ambition: The role of culturally contingent perceptions of the institutional environment in China. *International Journal of Entrepreneurial Behaviour and Research*, 25(6), 1283–1307.
- Wang, J., Xie, H., & Fisher, J. H. (2008). Multilevel Models. *Multilevel Models*, 495.
- Wannamakok, W., & Chang, Y. (2020). Understanding nascent women entrepreneurs: an exploratory investigation into their entrepreneurial intentions. *Gender in Management*, 35(6), 553–566.
- WEgate. *Who we are. WEgate - European Gateway for Women's Entrepreneurship*. WEgate. Retrieved 11 February, 2022, from <https://wegate.eu/about/who-we-are>
- Welter, F. (2004). The environment for female entrepreneurship in Germany. *Journal of Small Business and Enterprise Development*, 11(2), 212–221.
- Wen, J. F., & Gordon, D. v. (2014). An Empirical Model of Tax Convexity and Self-Employment. *The Review of Economics and Statistics*, 96(3), 471–482.
- Wennekers, S., & Thurik, R. (1999). Linking Entrepreneurship and Economic Growth. *Small Business Economics* 1999 13:1, 13(1), 27–56.

- Westhead, P., & Solesvik, M. Z. (2016). Entrepreneurship education and entrepreneurial intention: Do female students benefit?. *International small business journal*, 34(8), 979-1003.
- Williams, C. C. (2009). The motives of off-the-books entrepreneurs: Necessity- or opportunity-driven? *International Entrepreneurship and Management Journal*, 5(2), 203–217.
- Williams, N., & Vorley, T. (2015). Institutional asymmetry: How formal and informal institutions affect entrepreneurship in Bulgaria. *International Small Business Journal*, 33(8), 840-861.
- Wu, S., Crespi, C. M., & Wong, W. K. (2012). Comparison of methods for estimating the intraclass correlation coefficient for binary responses in cancer prevention cluster randomized trials. *Contemporary Clinical Trials*, 33(5), 869–880.
- Xiaopeng, D., & Pheng, L. S. (2013). Understanding the critical variables affecting the level of political risks in international construction projects. *KSCE Journal of Civil Engineering* 2013 17:5, 17(5), 895–907.
- Yay, T., Yay, G. G., & Aksoy, T. (2018). Impact of institutions on entrepreneurship: a panel data analysis. *Eurasian Economic Review*, 8(1), 131–160.
- Zampetakis, L. A., & Moustakis, V. (2006). Linking creativity with entrepreneurial intentions: A structural approach. *The International Entrepreneurship and Management Journal*, 2(3), 413–428.
- Zeffane, R. (2013). Need for achievement, personality and entrepreneurial potential: a study of young adults in the United Arab Emirates. *Journal of Enterprising Culture*, 21(01), 75–105.
- Zhao, X., & Xu, H. D. (2015). E-Government and Corruption: A Longitudinal Analysis of Countries. *International Journal of Public Administration*, 38(6), 410–421.

## Appendix

### Appendix A – countries in sample

List of countries included in the analysis:

1. United Arab Emirates
2. Argentina
3. Australia
4. Bulgaria
5. Brazil
6. Canada
7. Chile
8. China
9. Colombia
10. Cyprus
11. Germany
12. Ecuador
13. Estonia
14. Egypt
15. Spain
16. France
17. Greece
18. Guatemala
19. Croatia
20. Indonesia
21. Ireland
22. Israel
23. India
24. Iran
25. Italy
26. South-Korea
27. Kazakhstan
28. Lebanon
29. Luxembourg
30. Latvia
31. Morocco
32. Madagascar

33. Mexico
34. Malaysia
35. The Netherlands
36. Panama
37. Peru
38. Poland
39. Qatar
40. Saudi-Arabia
41. Sweden
42. Slovenia
43. Slovakia
44. Switzerland
45. Thailand
46. United Kingdom
47. United States
48. Uruguay
49. Vietnam
50. South-Africa

## Appendix B – control variables

Table 4: explanation of the variables used in the empirical model.

Variable	Abbreviation	Measurement	Source
<b>Dependent variable</b>			
TEA	TEA	Dummy that indicates if someone is involved in total early-stage entrepreneurial activity, 1 if yes, 0 if no. Binary variable	GEM 2017 – APS – Individual Level Data
<b>Independent variables</b>			
Female	female	Indicator of the gender of the surveyor. Indicates 1 if female, 0 if male. Binary variable.	GEM 2017 – APS – Individual Level Data
Government size	gov_size	Total expense percentage of government spending of the GDP of the country. Continuous variable.	The World Bank 2017
Education	educountr	Government expenditure on education as total percentage of government expenditure. Continuous variable.	The World Bank 2017
Regulatory burden	Regburden	Time required to start a business (in days). Continuous variable.	The World Bank 2017
Government stability	govstab	Corruption perception index. Index on a scale of 1-100. Continuous variable	Transparency International
Income regulations	taxrate	Profit tax in percentage of total commercial profits. Continuous variable.	The World Bank
Government support policies	suppgov	The extent to which public policies support entrepreneurship - entrepreneurship as a relevant economic issue on a scale of 1-5. Continuous variable	GEM 2017 – APS – Nation Level Data
<b>Individual level control variables</b>			
Age	age	The age of the surveyor at the moment of taking the survey. Ranges between 18 and 64 years old. Continuous variable.	
Education	education	The highest level of education the surveyor obtained. According to the United Nations harmonized educational attainment scheme: <ul style="list-style-type: none"> <li>0. Pre-primary education.</li> <li>1. Primary education or first stage of basic education.</li> <li>2. Lower secondary or second stage of basic education.</li> <li>3. (Upper) secondary education.</li> <li>4. Post-secondary non-tertiary education.</li> <li>5. First stage of tertiary education.</li> <li>6. Second stage of tertiary education.</li> </ul>	GEM 2017 – APS – Individual Level Data
Network	network	This is a categorical variable. Respondents are asked if they know someone who recently started a business, 1 if respondent replied with yes, 0 if no. Binary variable.	GEM 2017 – APS – Individual Level Data
Employment status	empl_status	Occupation measured as binary variable based on the GEM harmonized work status scheme: <ul style="list-style-type: none"> <li>1. Full: full or part time.</li> <li>2. Part time work only.</li> <li>3. Retired / disabled</li> <li>4. Homemaker</li> <li>5. Student</li> </ul>	GEM 2017 – APS – Individual Level Data

		6. Not working 7. Self-employed	
		Is equal to 1 when working. This means one is either full time employed, part time employed or self-employed. The variable equals 0 when not working, thus when retired or disabled, a homemaker, a student or not working. This is a binary variable.	
Entrepreneurial confidence	entrepr_conf	Indicator if one feels skilled, knowledgeable and confident to start a business. Variable indicates 1 if respondent replied yes, 0 if no. Binary variable.	GEM 2017 – APS – Individual Level Data
Entrepreneurial opportunity	Entrepr_opp	If there is a perceived opportunity to start a business in the next six months. Variable indicates 1 if respondent replied yes, 0 if no. Binary variable.	GEM 2017 – APS – Individual Level Data
<b>Country level control variables</b>			
GDP per capita	GDP	Gross Domestic product per capita in US dollars. Continuous variable.	The World Bank
GDP per capita growth	GDP_growth	Annual growth percentage of the gross domestic product per capita. Continuous variable.	The World Bank
Unemployment	unemployment	Unemployment percentage of total workforce. These individuals are not employed but are capable of being so or are currently looking for a job. Continuous variable.	The World Bank
Labor force	workforce	Number of individuals of 15 years and older that are either employed or seeking for a job. Continuous variable.	The World Bank
Export	export	Value of goods and services provided to other countries as a percentage of the GDP. Continuous variable.	The World Bank
Resources	Resources	Sum of oil, natural gas, coal, mineral and forest rent as a percentage of the GDP.	The World Bank

Appendix C – results of OLS of gender on control variables

Table 5: regression results of the OLS estimate of gender on the different individual level control variables

<b>Dependent variable</b>	1 Education	2 Education	3 Network	4 Network	5 Employment status	6 Employment status	7 Entrepreneurial confidence	8 Entrepreneurial confidence	9 Opportunity	10 Opportunity	11 Fear of failure	12 Fear of failure
<b>Independent variable</b>												
Female	-.106*** (.008)	.046*** (.008)	-.068*** (.003)	-.023*** (.003)	-.164*** (.003)	-.142*** (.003)	-.106*** (.003)	-.061*** (.003)	-.046*** (.003)	-.005* (.003)	.056*** (.003)	.045*** (.003)
<b>Individual level control variables</b>												
Age		-.0141*** (.000)		-.001*** (.000)		.001*** (.000)		.002*** (.000)		-.001*** (.000)		-.001*** (.000)
Education												
Pre-primary education												
Primary education				.069*** (.009)		.047*** (.010)		.014 (.009)		.001 (.009)		.004 (.010)
Lower secondary education				.097*** (.008)		.075*** (.009)		.028*** (.009)		.007 (.009)		-.039*** (.010)
Upper secondary education				.130*** (.008)		.135*** (.009)		.060*** (.009)		.033*** (.009)		-.035*** (.010)
Post-secondary education				.134*** (.009)		.188*** (.009)		.081*** (.009)		.039*** (.009)		-.018* (.010)
First-stage tertiary education				.168*** (.008)		.228*** (.009)		.103*** (.009)		.077*** (.009)		-.043*** (.010)
Second-stage tertiary education				.214*** (.012)		.247*** (.000)		.087*** (.012)		-.008 (.012)		-.065*** (.013)
Network		.216*** (.008)				.062*** (.000)		.199*** (.003)		.180*** (.003)		.008*** (.003)
Employment status		.449*** (.009)		.071*** (.003)				.109*** (.003)		.034*** (.003)		.018*** (.003)

Entrepreneurial confidence	.175*** (.008)	.195*** (.003)	.092*** (.003)					.138*** (.003)				-.121*** (.003)
Entrepreneurial opportunity	.121*** (.008)	.171*** (.003)	.028*** (.003)				.134*** (.003)					-.049*** (.003)
Fear of failure	-.051*** (.008)	.007*** (.003)	.014*** (.003)				-.110*** (.003)			-.047*** (.003)		
<b>Country level control variables</b>												
GDP per capita	.000*** (.000)	-.000*** (.000)	.000*** (.000)				-.000*** (.000)			.000*** (.000)		-.000 (.000)
GDP per capita growth	.062*** (.002)	.010*** (.001)	-.009*** (.001)				-.022*** (.001)			-.007*** (.001)		.004*** (.001)
Unemployment	-.008*** (.001)	-.000 (.000)	-.011*** (.000)				-.001*** (.000)			-.007*** (.000)		.004*** (.000)
Export	.000 (.000)	.001*** (.000)	.000*** (.000)				.001*** (.000)			-.000*** (.000)		.001*** (.000)
Natural resources	.021*** (.001)	.007*** (.000)	-.002*** (.000)				.000 (.000)			.003*** (.000)		.002*** (.000)
<b>Fixed parameter</b>												
Constant $\alpha_0$	3.298*** (.006)	2.649*** (.021)	.444*** (.002)	.063*** (.011)	.792*** (.002)	.588*** (.011)	.576*** (.002)	.367*** (.011)	.463*** (.002)	.384*** (.011)	.391*** (.002)	.413*** (.012)
R <sup>2</sup>	0.001	0.1220	0.005	0.130	0.033	0.114	0.011	0.138	0.002	0.101	0.003	0.031
Observations	118,795	118,795	118,795	118,795	118,795	118,795	118,795	118,795	118,795	118,795	118,795	118,795
											5	5

Notes: \*\*\* $p < 0.01$ , \*\* $p < 0.05$  and \* $p < 0.10$ . Standard error in parentheses. Number of individual observations: 118,795



## Appendix D – pairwise correlation

Table 6: pairwise correlation of all variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. TEA	1.000												
2. Female	-.051***	1.000											
3. Government size	-.073***	.047***	1.000										
4. Education	-.009***	.018***	.341***	1.000									
5. Regulatory burden	.028***	-.002	-.246***	-.138***	1.000								
6. Government stability	-.065***	-.025***	.240***	.414***	-.503***	1.000							
7. Income regulations	-.029***	.038***	.246***	.049***	.301***	-.259***	1.000						
8. Government support policies	-.045***	-.039***	-.366***	-.099***	.056***	.220***	.032***	1.000					
9. Age	-.056***	.022***	.145***	.052***	-.102***	.136***	.037***	-.026***	1.000				
10. Education pre-primary	-.008**	.033***	-.052***	-.049***	.026***	-.088***	.023***	-.056***	.080***	1.000			
11. Education primary	-.027***	.034***	.006***	-.048***	.070***	-.110***	.054***	-.102***	.144***	-.051***	1.000		
12. Education lower secondary	-.028***	.007**	.042***	-.012***	.047***	-.118***	.095***	-.048***	.017***	-.072***	-.146***	1.000	
13. Education upper secondary	-.001	-.020***	-.033***	.012***	.048***	-.040***	-.025***	-.015***	-.066***	-.107***	-.219***	-.307***	1.000
14. Education post-secondary	.004	-.006*	.031***	.025***	-.056***	.089***	.078***	.037***	-.044***	-.063***	-.129***	-.180***	-.269***
15. Education first stage tertiary	.039***	-.012***	-.016***	.031***	-.100***	.174***	-.155***	.074***	-.039***	-.088***	-.180***	-.252***	-.377***
16. Education second stage tertiary	.014***	-.007**	.013***	-.007**	-.017***	.027***	-.028***	.039***	.009***	-.025***	-.050***	-.070***	-.105***
17. Network	.196***	-.069***	-.079***	-.002	.024***	-.042***	-.083***	.007***	-.064***	-.056***	-.070***	-.051***	.010***
18. Employment status	.166***	-.181***	-.047***	.018***	-.052***	.104***	-.084***	.067***	.011***	-.067***	-.010***	-.092***	-.008***
19. Entrepreneurial confidence	.234***	-.106***	-.076***	-.014***	.023***	-.046***	-.078***	-.022***	.009***	-.035***	-.053***	-.044***	-.001***
20. Entrepreneurial opportunity	.147***	-.047***	-.053***	.068***	-.029**	.033***	-.089***	.028***	-.057***	-.033***	-.060***	-.050***	-.002
21. Fear of failure	-.090***	.056***	.033***	-.017***	-.041***	.021***	-.014***	-.003***	-.009***	.011***	.028***	-.004***	-.005*
22. GDP per capita	-.079***	-.029***	.107***	.171***	-.471***	.800***	-.229***	.244***	.116***	-.087***	-.075***	-.099***	-.038***
23. GDP per capita growth	-.010***	.023***	.039***	-.287***	-.064***	-.193***	.221***	.071***	.000***	.013***	-.038***	-.048***	.049***
24. Unemployment	-.082***	.021***	.497***	.120***	.011***	-.043***	.225***	-.369***	.069***	.014***	.107***	.072***	-.055***
25. Export	-.024***	-.023***	.025***	-.063***	-.392***	.327***	-.398***	.174***	.041***	-.064***	-.079***	-.070***	.021***
26. Natural resources	.038***	-.051***	-.425***	-.014***	.305***	-.189***	-.391***	.134***	-.155***	.008***	-.018***	-.017***	-.019***

Notes: \*\*\* $p < 0.01$ , \*\* $p < 0.05$  and \* $p < 0.01$ . Number of individual observations: 118,795

Table 4: continued

Variable	14	15	16	17	18	19	20	21	22	23	24	25	26
1. TEA													
2. Female													
3. Government size													
4. Education													
5. Regulatory burden													
6. Government stability													
7. Income regulations													
8. Government support policies													
9. Age													
10. Education pre-primary													
11. Education primary													
12. Education lower secondary													
13. Education upper secondary													
14. Education post-secondary	1.000												
15. Education first stage tertiary	-.221***	1.000											
16. Education second stage tertiary	-.062***	-.086***	1.000										
17. Network	.006***	.084***	.043***	1.000									
18. Employment status	.033***	.137***	.049***	.135***	1.000								
19. Entrepreneurial confidence	.004**	.076***	.030***	.263***	.163***	1.000							
20. Entrepreneurial opportunity	.002	.091***	.005*	.238***	.105***	.211***	1.000						
21. Fear of failure	.013***	-.021***	-.010**	-.037***	-.021***	-.138***	-.079***	1.000					
22. GDP per capita	.061***	.159***	.009***	-.067***	.081***	-.071***	.003	.025***	1.000				
23. GDP per capita growth	.048***	-.012***	-.049***	.009***	-.016***	-.065***	-.042***	.029***	-.172***	1.000			
24. Unemployment	.036***	-.099***	-.036***	-.087***	-.174***	-.065***	-.124***	.036***	-.061***	-.156***	1.000		
25. Export	-.005***	.091***	.060***	.025***	.083***	-.015***	.006***	.068***	.469***	.212***	-.219***	1.000	
26. Natural resources	-.043***	.053***	.078***	.128***	.050***	.100***	0.099***	-.007***	-.212***	-.340***	-.221***	-.004	1.000

Notes: \*\*\* $p < 0.01$ , \*\* $p < 0.05$  and \* $p < 0.1$ . Number of individual observations: 118,795

## Appendix E – VIF score

*Table 7: VIF scores of all variables*

Variable	1 VIF	2 VIF
Female	1.05	1.05
Government size		2.24
Education		1.63
Regulatory burden		1.80
Government stability		4.63
Income regulations		2.27
Government support policies		1.64
Age	1.08	1.09
Education		
Education pre-primary	-	-
Education primary	4.43	4.45
Education lower secondary	6.68	6.74
Education upper secondary	9.74	9.85
Education post-secondary	5.87	5.93
Education first stage tertiary	8.51	8.62
Education second stage tertiary	1.97	1.99
Network	1.15	1.15
Employment status	1.13	1.13
Entrepreneurial confidence	1.16	1.17
Entrepreneurial opportunity	1.11	1.12
Fear of failure	1.03	1.03
GDP per capita	1.81	4.10
GDP per capita growth	1.60	1.80
Unemployment	1.23	1.62
Export	1.60	2.06
Natural resources	1.53	2.12
Mean VIF	2.93	2.97

## Appendix F – ICC and null model

*Table 8: logistic regression results of the null model*

<b>Dependent variable: TEA</b>	Null model
<b>Fixed parameter</b>	
Constant $\alpha_0$	-1.961*** (.083)
<b>Variation parameter</b>	
Random effects parameter ( $var(u_{0j})$ )	.342*** (.070)
ICC	.094***

*Notes: \*\*\* $p < 0.01$ , \*\* $p < 0.05$  and \* $p < 0.10$ . Standard error in parentheses. Number of individual observations: 118,795. Number of countries: 50*

## Appendix G – results of CIM and AIM

Table 9: estimations of CIM model and the AIM model with random slopes for female

<b>Dependent variable = TEA</b>	<b>CIM</b>	<b>AIM</b>
<b>Independent variables</b>		
Female	-.030 (.020)	-.073** (.037)
Government size	-.021** (.009)	-.018* (.009)
Education	.011 (.064)	-.003 (.063)
Regulatory burden	-.024 (.029)	-.032 (.028)
Government stability	-.324 (.815)	-.160 (.795)
Income regulations	.005 (.005)	.003 (.005)
Government support policies	-.376** (.151)	-.339** (.147)
<b>Individual level control variables</b>		
Age	-.013*** (.001)	-.013*** (.001)
Education		
Pre-primary education		
Primary education	-.110 (.075)	-.106 (.075)
Lower secondary education	-.144** (.072)	-.137* (.072)
Upper secondary education	-.174** (.069)	-.166** (.070)
Post-secondary education	-.069 (.074)	-.052 (.072)
First-stage tertiary education	-.118* (.070)	-.106** (.071)
Second-stage tertiary education	-.085 (.089)	-.070 (.090)
Network	.808*** (.020)	.807*** (.020)
Employment status	1.250*** (.031)	1.264*** (.031)
Entrepreneurial confidence	1.228*** (.024)	1.223*** (.024)
Entrepreneurial opportunity	.406*** (.020)	.405*** (.020)
Fear of failure	-.299*** (.021)	-.298*** (.021)
<b>Country level control variables</b>		
GDP per capita	-.000 (.000)	-.000 (.000)
GDP per capita growth	-.028 (.040)	-.027 (.039)
Unemployment	-.013 (.016)	-.012 (.016)
Export	.002 (.003)	.002 (.003)
Natural resources	-.021 (.016)	-.021 (.016)
<b>Fixed parameter</b>		
Constant $\alpha_0$	-1.746*** (.562)	-1.827*** (.548)
<b>Variant parameters</b>		

Random intercept variance ( $var(u_{0j})$ )	.186*** (.039)	.174*** (.037)
Random slope variance ( $var(u_{1j})$ )		.041*** (.013)
Deviance	74,838.00	74,797.924

Notes: \*\*\* $p < 0.01$ , \*\* $p < 0.05$  and \* $p < 0.10$ . Standard error in parentheses. Number of individual observations: 118,795. Number of countries: 50

## Appendix H – results of regression separately for men and women

Table 10: regression results from the multilevel logistic regression with TEA as dependent variable for a sample of men

<b>Dependent variable = TEA</b>	1	2	3	4	5	6	7	8
<b>Independent variables</b>								
Government size		-.011 (.009)						-.016* (.009)
Education			-.020 (.057)					-.010 (.062)
Regulatory burden				-.032 (.027)				-.036 (.028)
Government stability					-.548 (.638)			-.149 (.789)
Income regulations						-.004 (.005)		.003 (.005)
Government support policies							-.299** (.132)	-.328** (.147)
<b>Individual level control variables</b>								
Age	-.012*** (.001)	-.012*** (.001)	-.012*** (.001)	-.012*** (.001)	-.012*** (.001)	-.012*** (.001)	-.012*** (.001)	-.012*** (.001)
Education								
Pre-primary education								
Primary education	-.158 (.105)	-.158 (.105)	-.158 (.105)	-.158 (.105)	-.158 (.105)	-.158 (.105)	-.158 (.105)	-.158 (.105)
Lower secondary education	-.174* (.099)	-.173* (.099)	-.173* (.099)	-.174* (.099)	-.173* (.099)	-.173* (.099)	-.173* (.099)	-.173* (.099)
Upper secondary education	-.178* (.096)	-.177* (.096)	-.177* (.096)	-.178* (.096)	-.177* (.096)	-.178* (.096)	-.177* (.096)	-.175* (.096)
Post-secondary education	-.032 (.099)	-.031 (.099)	-.032 (.099)	-.033 (.099)	-.031 (.099)	-.031 (.099)	-.031 (.099)	-.030 (.099)
First-stage tertiary education	-.069 (.097)	-.068 (.097)	-.068 (.097)	-.069 (.097)	-.068 (.097)	-.069 (.097)	-.068 (.097)	-.066 (.097)
Second-stage tertiary education	.029 (.119)	.032 (.119)	.029 (.119)	.029 (.119)	.030 (.119)	-.030 (.119)	-.030 (.119)	.034 (.119)
Network	.850*** (.027)	.850*** (.027)	.850*** (.027)	.850*** (.027)	.850*** (.027)	.850*** (.027)	.850*** (.027)	.849*** (.027)
Employment status	1.098*** (.046)	1.098*** (.046)	1.098*** (.046)	1.098*** (.046)	1.098*** (.046)	1.098*** (.046)	1.098*** (.046)	1.098*** (.046)
Entrepreneurial confidence	1.189*** (.033)	1.190*** (.033)	1.190*** (.033)	1.190*** (.033)	1.190*** (.033)	1.190*** (.033)	1.190*** (.033)	1.189*** (.033)
Entrepreneurial opportunity	.450*** (.027)	.450*** (.027)	.450*** (.027)	.450*** (.027)	.450*** (.027)	.450*** (.027)	.450*** (.027)	.451*** (.027)
Fear of failure	-.288*** (.028)	-.288*** (.028)	-.288*** (.028)	-.288*** (.028)	-.288*** (.028)	-.288*** (.028)	-.288*** (.028)	-.288*** (.028)
<b>Country level control variables</b>								
GDP per capita	-.000** (.000)	-.000** (.000)	-.000** (.000)	-.000** (.000)	-.000 (.000)	-.000** (.000)	-.000 (.000)	-.000 (.000)
GDP per capita growth	-.022 (.041)	-.030 (.041)	-.023 (.041)	-.028 (.041)	-.022 (.041)	-.019 (.041)	-.009 (.039)	-.028 (.039)
Unemployment	-.020 (.015)	-.019 (.016)	-.019 (.015)	-.022 (.014)	-.020 (.015)	-.019 (.015)	-.026* (.014)	.013 (.015)
Export	.001 (.003)	.002 (.003)	.001 (.003)	.000 (.003)	.001 (.003)	-.000 (.003)	-.000 (.002)	.001 (.003)
Natural resources	-.023 (.014)	-.032** (.016)	-.023 (.014)	-.020 (.014)	-.024* (.014)	-.027* (.015)	-.016 (.014)	-.023 (.015)
<b>Fixed parameter</b>								
Constant $\alpha_0$	-.3142*** (.282)	-2.885*** (.341)	-3.056*** (.369)	-2.853*** (.366)	-2.931*** (.372)	-2.936*** (.362)	-2.436*** (.411)	-1.715*** (.549)

<b>Variant parameters</b>								
Random intercept variance ( $var(u_{0j})$ )	.208*** (.044)	.201*** (.043)	.208*** (.044)	.202*** (.043)	.205*** (.044)	.205*** (.044)	.188*** (.040)	.170*** (.036)
ICC	5.95%	5.76%	5.94%	5.78%	5.86%	5.86%	5.40%	4.91%

Notes: \*\*\* $p < 0.01$ , \*\* $p < 0.05$  and \* $p < 0.01$ . Standard error in parentheses. Number of individual observations: 61,178. Number of countries: 50



Table 11: regression results from the multilevel logistic regression with TEA as dependent variable for a sample of women

<b>Dependent variable = TEA</b>	1	2	3	4	5	6	7	8
<b>Independent variables</b>								
Government size		-.022** (.010)						-.028*** (.010)
Education			-.013 (.066)					.036 (.069)
Regulatory burden				.010 (.031)				-.003 (.031)
Government stability					-1.358* (.720)			-.527 (.870)
Income regulations						-.001 (.006)		.005 (.006)
Government support policies							-.344** (.153)	-.432*** (.162)
<b>Individual level control variables</b>								
Age	-.014*** (.001)	-.014*** (.001)	-.014*** (.001)	-.014*** (.001)	-.014*** (.001)	-.014*** (.001)	-.014*** (.001)	-.013*** (.001)
Education								
Pre-primary education								
Primary education	-.051 (.108)	-.049 (.108)	-.051 (.109)	-.051 (.109)	-.051 (.108)	-.051 (.108)	-.051 (.109)	-.048 (.108)
Lower secondary education	-.099 (.104)	-.097 (.104)	-.099 (.104)	-.099 (.104)	-.099 (.104)	-.099 (.104)	-.098 (.104)	-.095 (.104)
Upper secondary education	-.167* (.101)	-.164 (.101)	-.167 (.101)	-.167 (.101)	-.165 (.101)	-.167 (.101)	-.166 (.101)	-.161 (.101)
Post-secondary education	-.104 (.106)	-.100 (.106)	-.103 (.106)	-.103 (.106)	-.101 (.106)	-.103 (.106)	-.102 (.106)	-.097 (.106)
First-stage tertiary education	-.179* (.103)	-.175* (.103)	-.179* (.103)	-.179* (.103)	-.176* (.103)	-.179* (.103)	-.178* (.103)	-.170 (.103)
Second-stage tertiary education	-.266* (.138)	-.258* (.138)	-.265* (.138)	-.265* (.138)	-.263* (.138)	-.265* (.138)	-.264* (.138)	-.254* (.138)
Network	.750*** (.031)	.750*** (.031)	.750*** (.031)	.750*** (.031)	.750*** (.031)	.750*** (.031)	.750*** (.031)	.749*** (.031)
Employment status	1.412*** (.042)	1.412*** (.042)	1.412*** (.042)	1.412*** (.042)	1.412*** (.042)	1.412*** (.042)	1.412*** (.042)	1.412*** (.042)
Entrepreneurial confidence	1.260*** (.035)	1.260*** (.035)	1.260*** (.035)	1.261*** (.035)	1.261*** (.035)	1.261*** (.035)	1.261*** (.035)	1.260*** (.035)
Entrepreneurial opportunity	.341*** (.031)	.341*** (.031)	.341*** (.031)	.341*** (.031)	.342*** (.031)	.341*** (.031)	.342*** (.031)	.342*** (.031)
Fear of failure	-.310*** (.031)	-.310*** (.031)	-.310*** (.031)	-.310*** (.031)	-.310*** (.031)	-.310*** (.031)	-.310*** (.031)	-.310*** (.031)
<b>Country level control variables</b>								
GDP per capita	-.000** (.000)	-.000*** (.000)	-.000** (.000)	-.000** (.000)	-.000** (.000)	-.000** (.000)	-.000** (.000)	-.000 (.000)
GDP per capita growth	-.028 (.047)	-.044 (.046)	-.028 (.048)	-.026 (.048)	-.027 (.046)	-.027 (.048)	-.012 (.046)	-.031 (.043)
Unemployment	-.028* (.017)	-.008 (.018)	-.028 (.017)	-.028 (.017)	-.028* (.016)	-.028 (.048)	-.034** (.016)	-.013 (.017)
Export	-.000 (.003)	.002 (.003)	-.000 (.003)	-.000 (.003)	-.000 (.003)	-.000 (.003)	-.001 (.003)	.002 (.003)
Natural resources	-.010 (.017)	-.027 (.018)	-.010 (.017)	-.010 (.017)	-.013 (.016)	-.010 (.017)	-.002 (.016)	-.017 (.017)
<b>Fixed parameter</b>								
Constant $\alpha_0$	-3.222*** (.322)	-2.714*** (.379)	-3.168*** (.425)	-3.309*** (.425)	-2.700*** (.416)	-3.172*** (.419)	-2.414*** (.472)	-1.745*** (.603)
<b>Variant parameters</b>								

Random intercept	.278***	.251***	.278***	.277***	.258***	.278***	.251***	.204***
variance ( $var(u_{0j})$ )	(.059)	(.054)	(.059)	(.059)	(.055)	(.059)	(.054)	(.044)
ICC	7.79%	7.09%	7.78%	7.77%	7.27%	7.78%	7.08%	5.84%

Notes: \*\*\* $p < 0.01$ , \*\* $p < 0.05$  and \* $p < 0.01$ . Standard error in parentheses. Number of individual observations: 57,617. Number of countries: 50

## Appendix I – results with control variables from 2016

Table 12: regression results from the multilevel logistic regression with TEA as dependent variable and random slopes for female with control variables from 2016

<b>Dependent variable = TEA</b>	1	2	3	4	5	6	7	8	H
<b>Independent variables</b>									
Female	-.074** (.037)	.231** (.098)	.019 (.136)	-.451*** (.075)	.347*** (.087)	-.208** (.098)	.147 (.181)	.164 (.178)	H1
Government size		-.007 (.009)						-.013 (.009)	
Education			-.003 (.063)					-.008 (.065)	
Regulatory burden				-.026 (.027)				-.030 (.029)	
Government stability					-.630 (.538)			-.377 (.665)	
Income regulations						-.004 (.005)		.001 (.005)	
Government support policies							-.335** (.124)	-.352** (.151)	
<b>Cross level interaction effect</b>									
Female * Government size		-.011*** (.004)						-.011*** (.003)	H2
Female * Education			-.021 (.030)					.043* (.023)	H3
Female * Regulatory burden				.057*** (.010)				.037*** (.010)	H4
Female * Government stability					-.797*** (.161)			-.345* (.186)	H5
Female * Income regulations						.003 (.002)		.003 (.002)	H6
Female * Government support policies							-.086 (.069)	-.117** (.052)	H7
<b>Individual level control variables</b>									
Age	-.013*** (.001)	-.013*** (.001)	-.013*** (.001)	-.013** (.001)	-.013*** (.001)	-.013*** (.001)	-.013*** (.001)	-.013*** (.001)	
Education									
Pre-primary education									
Primary education	-.106 (.075)	-.104 (.075)	-.105 (.075)	-.107 (.075)	-.104 (.075)	-.105 (.075)	-.106 (.075)	-.100 (.075)	
Lower secondary education	-.138* (.072)	-.136* (.072)	-.137* (.072)	-.138* (.072)	-.135* (.072)	-.137* (.072)	-.137* (.072)	-.130* (.072)	
Upper secondary education	-.168** (.070)	-.166** (.070)	-.168** (.070)	-.168** (.070)	-.165** (.070)	-.168** (.070)	-.167** (.070)	-.159** (.070)	
Post-secondary education	-.054 (.072)	-.052 (.072)	-.053 (.072)	-.054 (.072)	-.050 (.072)	-.053 (.072)	-.052 (.072)	-.044 (.072)	
First-stage tertiary education	-.109 (.071)	-.106 (.071)	-.108 (.071)	-.109 (.071)	-.105 (.071)	-.109 (.071)	-.107 (.071)	-.098 (.071)	
Second-stage tertiary education	-.073 (.090)	-.069 (.090)	-.073 (.090)	-.074 (.090)	-.072 (.090)	-.073 (.090)	-.072 (.090)	-.062 (.090)	
Network	.808*** (.020)	.808*** (.020)	.808*** (.020)	.808*** (.020)	.808*** (.020)	.808*** (.020)	.808*** (.020)	.807*** (.020)	
Employment status	1.264*** (.031)	1.264*** (.031)	1.264*** (.031)	1.266*** (.031)	1.266*** (.031)	1.264*** (.031)	1.264*** (.031)	1.270*** (.031)	
Entrepreneurial confidence	1.223*** (.024)	1.223*** (.024)	1.223*** (.024)	1.223*** (.024)	1.222*** (.024)	1.223*** (.024)	1.223*** (.024)	1.222*** (.024)	

Entrepreneurial opportunity	.404*** (.020)	.404*** (.020)	.404*** (.020)	.404*** (.020)	.404*** (.020)	.404*** (.020)	.405*** (.020)	.404*** (.020)
Fear of failure	-.298*** (.021)	-.297*** (.021)	-.298*** (.021)	-.298*** (.021)	-.298*** (.021)	-.298*** (.021)	-.298*** (.021)	-.298*** (.021)
<b>Country level control variables</b>								
GDP per capita	-.000** (.000)	-.000** (.000)	-.000** (.000)	-.000** (.000)	-.000 (.000)	-.000** (.000)	-.000** (.000)	-.000 (.000)
GDP per capita growth	-.005 (.027)	-.008 (.027)	-.005 (.028)	-.023 (.028)	-.011 (.027)	-.006 (.027)	-.009 (.025)	-.015 (.026)
Unemployment	-.022* (.014)	-.013 (.016)	-.022 (.014)	-.023* (.014)	-.023 (.013)	-.022 (.014)	-.031** (.014)	-.018 (.015)
Export	.001 (.003)	.002 (.003)	.001 (.003)	.001 (.003)	.001 (.003)	-.001 (.003)	-.002 (.003)	.002 (.003)
Natural resources	-.019 (.016)	-.026 (.018)	-.019 (.016)	-.015 (.017)	-.024 (.017)	-.024 (.017)	-.014 (.015)	-.021 (.018)
<b>Fixed parameter</b>								
Constant $\alpha_0$	3.332*** (.210)	3.203*** (.277)	3.345*** (.344)	3.143*** (.295)	3.063*** (.320)	3.120*** (.328)	2.446*** (.384)	1.885*** (.555)
<b>Variation parameters</b>								
Random intercept variance ( $var(u_{0j})$ )	.214*** (.045)	.210*** (.044)	.213*** (.045)	.222*** (.047)	.211*** (.044)	.212*** (.045)	.183*** (.039)	.180*** (.038)
Random slope variance ( $var(u_{1j})$ )	.042*** (.013)	.034*** (.011)	.042*** (.013)	.017*** (.008)	.019*** (.008)	.039*** (.012)	.039*** (.013)	.003 (.004)
ICC	6,10%	6,00%	6,09%	6,32%	6,03%	6,61%	5,28%	5,19%

Notes: \*\*\* $p < 0.01$ , \*\* $p < 0.05$  and \* $p < 0.1$ . Standard error in parentheses. Number of individual observations: 118,795. Number of countries: 50

Table 13: odds ratios from the multilevel logistic regression with TEA as dependent variable and random slopes for female with control variables from 2016

Dependent variable = TEA	1	2	3	4	5	6	7	8	H
<b>Independent variables</b>									
Female	.929** (.034)	1.260** (.124)	1.019 (.138)	.637*** (.048)	1.414*** (.124)	.813** (.079)	1.159 (.210)	1.179 (.210)	H1
Government size		.989 (.009)						.987* (.009)	
Education			1.003 (.063)					1.008 (.065)	
Regulatory burden				.974 (.026)				.970 (.028)	
Government stability					.532 (.286)			.686 (.457)	
Income regulations						.996 (.005)		1.001 (.005)	
Government support policies							.716** (.089)	.703** (.106)	
<b>Cross level interaction effect</b>									
Female * Government size		.989*** (.003)						.989*** (.003)	H2
Female * Education			.979 (.029)					1.044* (.024)	H3
Female * Regulatory burden				1.058*** (.011)				1.037*** (.010)	H4
Female * Government stability					.451*** (.072)			.708* (.132)	H5
Female * Income regulations						1.003 (.002)		1.003 (.002)	H6
Female * Government support policies							.918 (.064)	.890** (.046)	H7
<b>Individual level control variables</b>									
Age	.987*** (.001)	.987*** (.001)	.987 (.001)	.987*** (.001)	.987*** (.001)	.987*** (.001)	.987*** (.001)	.987*** (.001)	
Education									
Pre-primary education									
Primary education	.900 (.068)	.901 (.068)	.900 (.068)	.899 (.068)	.901 (.068)	.900 (.068)	.900 (.068)	.905 (.068)	
Lower secondary education	.871* (.063)	.873* (.063)	.872* (.063)	.870* (.063)	.873* (.063)	.872* (.063)	.872* (.063)	.878* (.063)	
Upper secondary education	.846** (.059)	.847** (.059)	.846** (.059)	.845** (.059)	.848** (.059)	.846** (.059)	.846** (.059)	.853** (.059)	
Post-secondary education	.948 (.068)	.949 (.069)	.948 (.069)	.948 (.068)	.951 (.069)	.948 (.068)	.949 (.069)	.957 (.069)	
First-stage tertiary education	.897 (.063)	.899 (.063)	.897 (.063)	.897 (.063)	.900 (.064)	.897 (.063)	.898 (.063)	.906 (.064)	
Second-stage tertiary education	.930 (.083)	.934 (.084)	.930 (.083)	.928 (.083)	.931 (.083)	.930 (.083)	.930 (.083)	.940 (.084)	
Network	2.244*** (.046)	2.243*** (.046)	2.244*** (.046)	2.243*** (.046)	2.243*** (.046)	2.244*** (.046)	2.243*** (.046)	2.242*** (.046)	
Employment status	3.538*** (.109)	3.541*** (.109)	3.539*** (.109)	3.546*** (.109)	3.548*** (.110)	3.539*** (.109)	3.538*** (.109)	3.561*** (.110)	
Entrepreneurial confidence	3.399*** (.082)	3.397*** (.082)	3.398*** (.082)	3.397*** (.082)	3.394*** (.082)	3.399*** (.082)	3.398*** (.082)	3.393*** (.082)	
Entrepreneurial opportunity	1.498*** (.030)	1.498*** (.030)	1.498*** (.030)	1.499*** (.030)	1.498*** (.030)	1.498*** (.030)	1.499*** (.030)	1.497*** (.030)	

Fear of failure	.742*** (.015)	.743*** (.015)	.742*** (.015)	.742*** (.015)	.743*** (.015)	.742*** (.015)	.742*** (.015)	.743*** (.015)
<b>Country level control variables</b>								
GDP per capita	1.000** (.000)	1.000** (.000)	1.000** (.000)	1.000** (.000)	1.000 (.000)	1.000** (.000)	1.000** (.000)	1.000 (.000)
GDP per capita growth	.995 (.027)	.992 (.027)	.995 (.028)	.996 (.028)	.989 (.027)	.994 (.027)	.991 (.025)	.985 (.026)
Unemployment	.978* (.013)	.987 (.016)	.978 (.013)	.977 (.014)	.977 (.013)	.978 (.013)	.970** (.013)	.983 (.015)
Export	1.001 (.003)	1.002 (.003)	1.001 (.003)	1.001 (.003)	1.001 (.003)	1.001 (.003)	1.002 (.003)	1.002 (.003)
Natural resources	.981 (.016)	.976* (.017)	.981 (.016)	.985 (.017)	.977 (.015)	.977 (.017)	.986 (.015)	.979 (.018)
<b>Fixed parameter</b>								
Constant $\alpha_0$	.036*** (.008)	.041*** (.011)	.035*** (.012)	.043*** .013	.047*** (.015)	.044*** (.014)	.087*** (.033)	.152*** (.084)
<b>Variant parameters</b>								
Random intercept variance ( $var(u_{0j})$ )	.214*** (.045)	.210*** (.044)	.213*** (.045)	.222*** (.046)	.211*** (.044)	.212*** (.045)	.183*** (.039)	.180*** (.038)
Random slope variance ( $var(u_{1j})$ )	.042*** (.013)	.034*** (.011)	.042*** (.013)	.017*** (.008)	.019*** (.008)	.039*** (.012)	.039*** (.013)	.003 (.004)
ICC	6.10%	6.00%	6.09%	6.32%	6.03%	6.06%	5.28%	5.19%

Notes: \*\*\* $p < 0.01$ , \*\* $p < 0.05$  and \* $p < 0.01$ . Standard error in parentheses. Number of individual observations: 118,795. Number of countries: 50

## Appendix J – results with alternative measures

Table 14: regression results from the multilevel logistic regression with TEA as dependent variable and random slopes for female with different measures for the governmental institutions

Dependent variable = TEA	1	2	3	4	5	6	H
<b>Independent variables</b>							
Female	-.074** (.037)	.137* (.078)	-.196*** (.046)	-.059* (.034)	.124 (.108)	.127 (.133)	H1
Education		-.003 (.003)				-.004 (.003)	
Regulatory burden			.004 (.005)			.002 (.005)	
Government stability				-.051 (.048)		.037 (.143)	
Income regulations					-.842 (.614)	-.891 (.634)	
<b>Cross level interaction effect</b>							
Female * Education		-.004** (.001)				-.003** (.001)	H3
Female * Regulatory burden			.007*** (.002)			.005*** (.002)	H4
Female * Government stability				-.157*** (.047)		-.046 (.049)	H5
Female * Income regulations					-.478* (.250)	-.308 (.217)	H6
<b>Individual level control variables</b>							
Age	-.013*** (.001)	-.013*** (.001)	-.012*** (.001)	-.013*** (.001)	-.013*** (.001)	-.013 (.001)	
Education							
Pre-primary education							
Primary education	-.106 (.075)	-.105 (.075)	-.107 (.075)	-.105 (.075)	-.106 (.075)	-.105 (.075)	
Lower secondary education	-.138* (.072)	-.137* (.071)	-.138* (.072)	-.136* (.072)	-.138* (.072)	-.137* (.072)	
Upper secondary education	-.168** (.070)	-.167** (.070)	-.168** (.070)	-.165** (.070)	-.168** (.070)	-.167** (.070)	
Post-secondary education	-.053 (.072)	-.051 (.072)	-.054 (.072)	.051 (.072)	-.053 (.072)	.050 (.072)	
First-stage tertiary education	-.108 (.071)	-.107 (.071)	-.109 (.071)	-.106 (.071)	-.108 (.071)	-.106 (.071)	
Second-stage tertiary education	-.073 (.090)	-.071 (.090)	-.076 (.090)	-.071 (.090)	-.072 (.090)	-.071 (.090)	
Network	.808*** (.020)	.808*** (.020)	.808*** (.020)	.808*** (.020)	.808*** (.075)	.808*** (.020)	
Employment status	1.264*** (.031)	1.264*** (.031)	1.264*** (.031)	1.266*** (.031)	1.264*** (.031)	1.267*** (.031)	
Entrepreneurial confidence	1.223*** (.024)	1.223*** (.024)	1.223*** (.024)	1.223*** (.024)	1.223*** (.024)	1.223*** (.024)	
Entrepreneurial opportunity	.406*** (.020)	.404*** (.020)	.405*** (.020)	.404*** (.020)	.406*** (.020)	.404*** (.020)	
Fear of failure	-.298*** (.021)	-.298*** (.021)	-.298*** (.021)	-.298*** (.021)	-.298*** (.021)	-.298*** (.021)	
<b>Country level control variables</b>							
GDP per capita	.000** (.000)	.000* (.000)	.000* (.000)	.000 (.000)	.000* (.000)	.000 (.000)	

GDP per capita growth	-0.021 (.041)	-0.018 (.041)	-0.023 (.041)	-0.021 (.041)	-0.017 (.040)	-0.015 (.040)
Unemployment	-0.021 (.015)	-0.015 (.015)	-0.027* (.015)	-0.022 (.015)	-0.018 (.015)	-0.014 (.016)
Export	.001 (.003)	-.000 (.003)	.001 (.003)	.001 (.003)	.003 (.003)	.002 (.003)
Natural resources	-.020 (.015)	-.021 (.014)	-.023 (.015)	-.021 (.015)	-.014 (.015)	-.016 (.015)
<b>Fixed parameter</b>						
Constant $\alpha_0$	-3.24*** (.274)	-3.108*** (.294)	-3.279*** (.276)	-3.277*** (.280)	-3.066*** (.302)	-2.894*** (.366)
<b>Variant parameters</b>						
Random intercept variance ( $var(u_{0j})$ )	.214*** (.045)	.207*** (.043)	.212*** (.044)	.216*** (.045)	.207*** (.044)	.198*** (.042)
Random slope variance ( $var(u_{1j})$ )	.042*** (.013)	.032*** (.011)	.025*** (.009)	.031*** (.010)	.038*** (.012)	.017*** (.007)
ICC	6.12%	5.91%	6.04%	6.15%	5.91%	5.67%

Notes: \*\*\* $p < 0.01$ , \*\* $p < 0.05$  and \* $p < 0.1$ . Standard error in parentheses. Number of individual observations: 118,795. Number of countries: 50



Table 15: odds ratio from the multilevel logistic regression with TEA as dependent variable and random slopes for female with different measures for the governmental institutions

Dependent variable = TEA	1	2	3	4	5	6	H
<b>Independent variables</b>							
Female	.929** (.034)	1.146* (.090)	.822*** (.038)	.943* (.032)	1.132 (.123)	1.135 (.151)	H1
Education		.997 (.003)				.996 (.003)	
Regulatory burden			1.004 (.005)			1.002 (.005)	
Government stability				.950 (.130)		1.038 (.159)	
Income regulations					.431 (.265)	.410 (.260)	
<b>Cross level interaction effect</b>							
Female * Education		.996*** (.001)				.997** (.001)	H3
Female * Regulatory burden			1.007*** (.002)			1.005 (.002)	H4
Female * Government stability				.855*** (.041)		.955 (.047)	H5
Female * Income regulations					.620* (.155)	.735 (.159)	H6
<b>Individual level control variables</b>							
Age	.987*** (.001)	.987*** (.001)	.987*** (.001)	.987*** (.001)	.987*** (.001)	.987*** (.001)	
Education							
Pre-primary education							
Primary education	.899 (.068)	.900 (.068)	.899 (.068)	.901 (.068)	.899 (.068)	.900 (.068)	
Lower secondary education	.871* (.063)	.872* (.063)	.871* (.063)	.873* (.063)	.871* (.063)	.872* (.063)	
Upper secondary education	.846** (.059)	.847** (.059)	.845** (.059)	.848** (.059)	.845** (.059)	.846** (.059)	
Post-secondary education	.948 (.068)	.950 (.069)	.948 (.068)	.950 (.069)	.948 (.069)	.951 (.069)	
First-stage tertiary education	.898 (.063)	.899 (.063)	.897 (.063)	.900 (.064)	.898 (.063)	.899 (.063)	
Second-stage tertiary education	.930 (.083)	.932 (.084)	.927 (.083)	.931 (.084)	.931 (.083)	.932 (.084)	
Network	2.244*** (.046)	2.243*** (.046)	2.243*** (.046)	2.243*** (.046)	2.243*** (.046)	2.243*** (.046)	
Employment status	3.538*** (.109)	3.541*** (.109)	3.542*** (.109)	3.548*** (.110)	3.541*** (.109)	3.551*** (.110)	
Entrepreneurial confidence	3.399*** (.082)	3.398*** (.082)	3.398*** (.082)	3.396 (.082)	3.398*** (.082)	3.396*** (.082)	
Entrepreneurial opportunity	1.499*** (.030)	1.498*** (.030)	1.499*** (.030)	1.498*** (.030)	1.499*** (.030)	1.498*** (.030)	
Fear of failure	.742*** (.015)	.743*** (.015)	.742*** (.015)	.742*** (.015)	.742*** (.015)	.742*** (.015)	
<b>Country level control variables</b>							
GDP per capita	1.000** (.000)	1.000* (.000)	1.000* (.000)	1.000* (.000)	1.000** (.000)	1.000 (.000)	
GDP per capita growth	.979 (.040)	.982 (.040)	.977 (.040)	.979 (.040)	.983 (.040)	.985 (.039)	
Unemployment	.979 (.014)	.985 (.015)	.974* (.015)	.979 (.014)	.982 (.014)	.986 (.016)	
Export	1.001 (.003)	1.000 (.003)	1.001 (.003)	1.002 (.003)	1.002 (.003)	1.002 (.003)	
Natural resources	.980	.979	.977	.979	.986	.985	

	(.014)	(.014)	(.014)	(.014)	(.015)	(.015)
<b>Fixed parameter</b>						
Constant $\alpha_0$	.039*** (.011)	.045*** (.013)	.038*** (.010)	.038*** (.011)	.047*** (.014)	.055*** (.020)
<b>Variant parameters</b>						
Random intercept variance ( $var(u_{0j})$ )	.214*** (.045)	.207*** (.043)	.212*** (.044)	.216*** (.045)	.207*** (.044)	.198*** (.042)
Random slope variance ( $var(u_{1j})$ )	.042*** (.013)	.032*** (.011)	.025*** (.009)	.031*** (.010)	.038*** (.012)	.017*** (.007)
ICC	6.12%	5.91%	6.04%	6.15%	5.91%	5.67%

Notes: \*\*\* $p < 0.01$ , \*\* $p < 0.05$  and \* $p < 0.10$ . Standard error in parentheses. Number of individual observations: 118,795. Number of countries: 50

## Appendix K – extensive interpretation of results of alternative model

To assess the robustness of the main analysis I compare the results of table 2 and 3 with the results of the robustness check in Appendix J table 14 and 15. In both table 2 model 3 and Appendix J table 14 model 2 the interaction effect of the education measure and gender on an individual's entrepreneurial activity has a negative effect ( $\beta = -0.021$  and  $\beta = -0.004$ ) on female entrepreneurial engagement in comparison to male entrepreneurial engagement. The estimation of the second model differs in one aspect with the original estimation. In the estimation with the alternative measure of education the negative and moderating effect is significant ( $p < 0.05$ ) compared to not significant in the main analysis of table 2. According to the odds ratio in Appendix J table 15 this suggests that when the percentage of tertiary educated people goes up by 1%, this decreases the odds of women being engaged in entrepreneurial activity by 0.4% in comparison to men. Thus, in both models education has a negatively moderating effect on entrepreneurial activity for women in comparison with men, which is in contradiction to what is stated in hypothesis 3. However, the negative moderating effect is only significant in the analysis with the alternative measures. Reasoning for this could be that higher education leads to a higher awareness for women about their disadvantages in entrepreneurship which would discourage them more from entrepreneurship in comparison to men (Oosterbeek et al., 2010).

Comparing model 4 in table 2 and model 3 in Appendix J table 14, both the interaction term of gender with *start-up procedures* and *days to business* have a positive ( $\beta = 0.057$  and  $\beta = 0.007$ ) and significant ( $p < 0.01$ ) effect on the individual level of TEA for women in comparison to men. The odds ratio in Appendix J table 15 suggests that one extra day needed to set up a business will increase the odds of women engaging in entrepreneurial activity by 0,7% in comparison to men. These results correspond with the result found in the main analysis. Thus, in both cases hypothesis 4 is rejected.

Model 5 in table 2 and model 4 in Appendix J table 14 both depict the different relationship of *governmental stability* on entrepreneurial engagement for men and women. In model 5 of table 14 the interaction term of the corruption perception index and gender has a negative ( $\beta = -0.797$ ) and significant ( $p < 0.01$ ) effect on the TEA rate. For the interaction term of the political stability index this relationship is also negative ( $\beta = -0.157$ ) and significant ( $p < 0.01$ ). This indicates that increased political stability has a negative effect on women engaging in entrepreneurial activity in comparison to men. The odds ratio in table 15 shows that the odds of women engaging in entrepreneurial activity decreases with 14,5% when the political stability index raises with one in comparison to men. The relationship of governmental stability is similar in both models, and they both lead to rejecting hypothesis 5.

Model 5 in Appendix J table 13 and model 6 in table 2 have a corresponding moderating effect on the relationship of gender with entrepreneurial activity. The model in table 2 implies

that a higher level of profit tax as a percentage of the GDP has a positive ( $\beta = 0.003$ ) but insignificant moderating effect on the TEA level. Appendix J table 14 suggests a similar relationship, namely that the increase of the tax attractiveness index has a negative ( $\beta = -0.478$ ) but insignificant ( $p < 0.10$ ) moderating effect on female entrepreneurial activity in comparison to men. Both results are not in line with what is stated in hypothesis 6.

In model 6 of Appendix J table 14 and model 8 of table 2 all interaction effects of all independent governmental institutional variables with female are presented. As previously discussed, in model 8 of table 2 all models stay very similar. The same boats for the results in Appendix J table 14. All results in model 6 have the same sign as in their individually estimated models. They only depicted difference is that the interaction effects of *gender* and *governmental stability* and the interaction effects of *gender* and *income regulations* become statistically insignificant.

## Appendix L – countries in alternative sample

List of countries included in the analysis with the alternative sample:

1. United Arab Emirates
2. Argentina
3. Australia
4. Bulgaria
5. Brazil
6. Canada
7. Chile
8. China
9. Colombia
10. Cyprus
11. Germany
12. Ecuador
13. Estonia
14. Egypt
15. France
16. Greece
17. Guatemala
18. Croatia
19. Indonesia
20. Ireland
21. Israel
22. India
23. Iran
24. Italy
25. South-Korea
26. Kazakhstan
27. Lebanon
28. Luxembourg
29. Latvia
30. Morocco
31. Madagascar
32. Mexico
33. Malaysia
34. The Netherlands

35. Panama
36. Peru
37. Poland
38. Qatar
39. Saudi-Arabia
40. Sweden
41. Slovenia
42. Slovakia
43. Switzerland
44. Thailand
45. United Kingdom
46. United States
47. Uruguay
48. Vietnam
49. South-Africa

## Appendix M – results from regression in alternative sample

Table 16: regression results from the multilevel logistic regression with TEA as dependent variable and random slopes for female from the alternative sample excluding Spain

Dependent variable = TEA	1	2	3	4	5	6	7	8	H
<b>Independent variables</b>									
Female	-.083** (.038)	.230** (.098)	.010 (.137)	-.458*** (.076)	.342*** (.087)	-.211** (.098)	.130 (.184)	.144 (.163)	H1
Government size		-.012 (.009)						-.018* (.010)	
Education			-.019 (.058)					-.020 (.066)	
Regulatory burden				-.036 (.028)				-.035 (.029)	
Government stability					-.510 (.652)			.015 (.829)	
Income regulations						-.005 (.005)		.003 (.005)	
Government support policies							-.289** (.134)	-.356** (.154)	
<b>Cross level interaction effect</b>									
Female * Government size		-.012*** (.004)						-.011*** (.003)	H2
Female * Education			-.021 (.030)					.052** (.021)	H3
Female * Regulatory burden				.056*** (.010)				.035*** (.009)	H4
Female * Government stability					-.808*** (.160)			-.451* (.170)	H5
Female * Income regulations						.003 (.002)		.002 (.002)	H6
Female * Government support policies							-.082 (.070)	-.096** (.048)	H7
<b>Individual level control variables</b>									
Age	-.013*** (.001)	-.013*** (.001)	-.013*** (.001)	-.013** (.001)	-.013*** (.001)	-.013*** (.001)	-.013*** (.001)	-.013*** (.001)	
Education									
Pre-primary education									
Primary education	-.065 (.078)	-.063 (.078)	-.064 (.078)	-.066 (.078)	-.063 (.078)	-.064 (.078)	-.064 (.078)	-.058 (.078)	
Lower secondary education	-.141* (.072)	-.139* (.073)	-.141* (.073)	-.142* (.073)	-.139* (.073)	-.140* (.073)	-.140* (.073)	-.133* (.073)	
Upper secondary education	-.194*** (.071)	-.192*** (.071)	-.193*** (.071)	-.194*** (.071)	-.191*** (.071)	-.194*** (.071)	-.193*** (.071)	-.184*** (.071)	
Post-secondary education	-.048 (.074)	-.046 (.073)	-.047 (.074)	-.048 (.074)	-.044 (.074)	-.047 (.074)	-.046 (.074)	-.038 (.074)	
First-stage tertiary education	-.136* (.072)	-.133* (.072)	-.135* (.072)	-.136* (.072)	-.133 (.072)	-.136* (.072)	-.135* (.072)	-.124* (.090)	
Second-stage tertiary education	-.085 (.091)	-.080 (.091)	-.085 (.091)	-.086 (.090)	-.084 (.090)	-.084 (.091)	-.084 (.091)	-.073 (.090)	
Network	.802*** (.020)	.802*** (.021)	.802*** (.021)	.802*** (.021)	.802*** (.021)	.802*** (.021)	.802*** (.021)	.801*** (.021)	
Employment status	1.246*** (.033)	1.247*** (.033)	1.246*** (.033)	1.248*** (.033)	1.249*** (.033)	1.246*** (.033)	1.246*** (.033)	1.254*** (.032)	
Entrepreneurial confidence	1.183*** (.025)	1.182*** (.025)	1.183*** (.025)	1.182*** (.025)	1.181*** (.025)	1.183*** (.025)	1.183*** (.025)	1.181*** (.025)	

Entrepreneurial opportunity	.392*** (.021)	.392*** (.021)	.392*** (.021)	.392*** (.021)	.391*** (.021)	.392*** (.021)	.392*** (.021)	.391*** (.021)
Fear of failure	-.298*** (.022)	-.297*** (.022)	-.298*** (.022)	-.298*** (.022)	-.297*** (.022)	-.298*** (.022)	-.298*** (.022)	-.297*** (.022)
<b>Country level control variables</b>								
GDP per capita	-.000** (.000)	-.000** (.000)	-.000* (.000)	-.000* (.000)	-.000 (.000)	-.000* (.000)	-.000 (.000)	-.000 (.000)
GDP per capita growth	-.018 (.041)	-.029 (.041)	-.019 (.041)	-.023 (.042)	-.018 (.042)	-.014 (.041)	-.005 (.040)	-.024 (.040)
Unemployment	-.018 (.015)	-.003 (.017)	-.017 (.016)	-.020 (.016)	-.018 (.016)	-.017 (.015)	-.023 (.014)	-.007 (.017)
Export	.000 (.003)	.002 (.003)	.000 (.003)	.000 (.003)	.000 (.003)	-.000 (.003)	-.000 (.002)	.002 (.003)
Natural resources	-.020 (.015)	-.031** (.016)	-.020 (.015)	-.016 (.015)	-.021 (.015)	-.024 (.015)	-.013 (.014)	-.021 (.016)
<b>Fixed parameter</b>								
Constant $\alpha_0$	3.203*** (.277)	2.929*** (.333)	3.124*** (.366)	2.896*** (.374)	3.024*** (.375)	2,984*** (.361)	2.527*** (.410)	1.786*** (.567)
<b>Variation parameters</b>								
Random intercept variance ( $var(u_{0j})$ )	.215*** (.046)	.204*** (.043)	.214*** (.046)	.221*** (.047)	.217*** (.046)	.213*** (.045)	.194*** (.041)	.186*** (.039)
Random slope variance ( $var(u_{1j})$ )	.043*** (.013)	.033*** (.011)	.043*** (.013)	.017*** (.008)	.019*** (.008)	.040*** (.013)	.040*** (.013)	.000 (.000)
ICC	6,13%	5,83%	6,11%	6,27%	6,18%	6,07%	5,57%	5,35%

Notes: \*\*\* $p < 0.01$ , \*\* $p < 0.05$  and \* $p < 0.10$ . Standard error in parentheses. Number of individual observations: 101,107. Number of countries: 49



Table 17: odds ratio from the multilevel logistic regression with TEA as dependent variable and random slopes for female with the alternative sample excluding Spain

Dependent variable = TEA	1	2	3	4	5	6	7	8	H
<b>Independent variables</b>									
Female	.920** (.035)	1.259** (.123)	1.011 (.138)	.632*** (.048)	1.408*** (.122)	.810** (.080)	1.139 (.210)	1.155 (.188)	H1
Government size		.988 (.009)						.983* (.009)	
Education			.981 (.057)					.980 (.064)	
Regulatory burden				.964 (.027)				.966 (.028)	
Government stability					.601 (.392)			1.015 (.841)	
Income regulations						.995 (.005)		1.003 (.005)	
Government support policies							.749** (.100)	.700** (.111)	
<b>Cross level interaction effect</b>									
Female * Government size		.988*** (.003)						.989*** (.003)	H2
Female * Education			.979 (.029)					1.053* (.023)	H3
Female * Regulatory burden				1.058*** (.011)				1.035*** (.009)	H4
Female * Government stability					.456*** (.071)			.637* (.109)	H5
Female * Income regulations						1.003 (.002)		1.002 (.002)	H6
Female * Government support policies							.921 (.064)	.908** (.043)	H7
<b>Individual level control variables</b>									
Age	.987*** (.001)	.987*** (.001)	.987 (.001)	.987*** (.001)	.987*** (.001)	.987*** (.001)	.987*** (.001)	.987*** (.001)	
Education									
Pre-primary education									
Primary education	.937 (.073)	.939 (.073)	.938 (.073)	.936 (.073)	.939 (.073)	.938 (.073)	.938 (.073)	.943 (.073)	
Lower secondary education	.868* (.064)	.870* (.064)	.869* (.064)	.868* (.064)	.871* (.064)	.869* (.063)	.869* (.064)	.876* (.064)	
Upper secondary education	.824*** (.058)	.825*** (.059)	.824*** (.058)	.823*** (.058)	.826*** (.059)	.824*** (.058)	.824*** (.059)	.832*** (.059)	
Post-secondary education	.954 (.070)	.955 (.071)	.954 (.070)	.953 (.070)	.957 (.071)	.954 (.070)	.955 (.071)	.963 (.071)	
First-stage tertiary education	.873** (.063)	.875** (.063)	.873** (.063)	.873* (.063)	.876* (.063)	.873* (.063)	.874* (.063)	.883* (.064)	
Second-stage tertiary education	.919 (.083)	.923 (.084)	.919 (.083)	.917 (.083)	.920 (.083)	.919 (.083)	.920 (.083)	.930 (.084)	
Network	2.230*** (.048)	2.230*** (.048)	2.230*** (.048)	2.229*** (.048)	2.229*** (.048)	2.230*** (.048)	2.229*** (.048)	2.228*** (.048)	
Employment status	3.475*** (.113)	3.478*** (.113)	3.476*** (.113)	3.483*** (.113)	3.486*** (.114)	3.476*** (.113)	3.475*** (.113)	3.503*** (.114)	
Entrepreneurial confidence	3.263*** (.082)	3.262*** (.082)	3.263*** (.082)	3.262*** (.082)	3.258*** (.081)	3.264*** (.082)	3.263*** (.082)	3.257*** (.081)	
Entrepreneurial opportunity	1.480*** (.031)	1.479*** (.031)	1.480*** (.031)	1.480*** (.031)	1.479*** (.031)	1.480*** (.031)	1.480*** (.031)	1.479*** (.031)	

Fear of failure	.743*** (.016)	.743*** (.016)	.743*** (.016)	.742*** (.016)	.743*** (.016)	.742*** (.016)	.743*** (.016)	.743*** (.016)
<b>Country level control variables</b>								
GDP per capita	1.000** (.000)	1.000** (.000)	1.000* (.000)	1.000** (.000)	1.000 (.000)	1.000** (.000)	1.000 (.000)	1.000 (.000)
GDP per capita growth	.982 (.041)	.997 (.040)	.981 (.041)	.977 (.041)	.982 (.041)	.986 (.041)	.995 (.040)	.977 (.039)
Unemployment	.982 (.015)	.991 (.016)	.984 (.016)	.981 (.015)	.982 (.041)	.984 (.015)	.978 (.015)	.993 (.017)
Export	1.000 (.003)	1.002 (.003)	1.000 (.003)	1.000 (.003)	1.000 (.003)	1.000 (.003)	1.000 (.002)	1.002 (.003)
Natural resources	.980 (.014)	.970* (.015)	.980 (.014)	.984 (.015)	.979 (.014)	.977 (.015)	.987 (.014)	.980 (.016)
<b>Fixed parameter</b>								
Constant $\alpha_0$	.041*** (.011)	.053*** (.018)	.044*** (.016)	.055*** .021	.049*** (.018)	.051*** (.018)	.080*** (.033)	.168*** (.095)
<b>Variant parameters</b>								
Random intercept variance ( $var(u_{0j})$ )	.215*** (.046)	.204*** (.043)	.214*** (.046)	.220*** (.047)	.217*** (.045)	.213*** (.045)	.194*** (.041)	.186*** (.039)
Random slope variance ( $var(u_{1j})$ )	.043*** (.013)	.033*** (.011)	.043*** (.013)	.017*** (.008)	.019*** (.008)	.040*** (.013)	.040*** (.013)	.000 (.000)
ICC	6.13%	5.83%	6.11%	6.27%	6.18%	6.07%	5.57%	5.35%

Notes: \*\*\* $p < 0.01$ , \*\* $p < 0.05$  and \* $p < 0.01$ . Standard error in parentheses. Number of individual observations: 101,107. Number of countries: 49

## Appendix N – countries in fixed effects model

List of countries included in the analysis for the fixed effects model:

1. Argentina
2. Australia
3. Brazil
4. Chile
5. Colombia
6. Germany
7. Ecuador
8. Estonia
9. Egypt
10. Spain
11. Greece
12. Guatemala
13. Croatia
14. Indonesia
15. Israel
16. Iran
17. Lebanon
18. Luxembourg
19. Latvia
20. Mexico
21. Malaysia
22. The Netherlands
23. Panama
24. Peru
25. Slovenia
26. South-Africa

## Appendix O – results of fixed effects regression

Table 18: regression results from the multilevel logistic regression with TEA as dependent variable and random slopes for female estimated with the fixed effects method

Dependent variable = TEA	1	2	3	4	5	6	7	8	H	
<b>Independent variables</b>										
Female	.014*** (.002)	.008 (.007)	-.015 (.009)	-.006 (.008)	.026*** (.008)	.011* (.006)	-.007 (.011)	-.025 (.019)		H1
Government size		-.012*** (.002)						-.013*** (.002)		
Education			.089*** (.008)					.092*** (.014)		
Regulatory burden				.021*** (.003)				.019*** (.004)		
Government stability					-.000 (.001)			.002 (.002)		
Income regulations						.001** (.000)		-.000 (.001)		
Government support policies							-.035*** (.005)	-.023** (.010)		
<b>Cross level interaction effect</b>										
Female * Government size		.000 (.000)						.000 (.000)		H2
Female * Education			.007*** (.002)					.009*** (.003)		H3
Female * Regulatory burden				.002*** (.001)				.001 (.001)		H4
Female * Government stability					-.000 (.000)			-.001** (.000)		H5
Female * Income regulations						.000 (.000)		-.000* (.000)		H6
Female * Government support policies							.009* (.005)	.006 (.005)		H7
<b>Individual level control variables</b>										
Age	-.001*** (.000)	-.001*** (.000)	-.001*** (.000)	-.001*** (.000)	-.001*** (.000)	-.001*** (.000)	-.001*** (.000)	-.001*** (.000)		
Education										
Pre-primary education										
Primary education	.013* (.008)	.009 (.008)	.013* (.008)	.012 (.008)	.013* (.008)	.013* (.008)	.013* (.008)	.009 (.008)		
Lower secondary education	.012 (.007)	.009 (.008)	.010 (.007)	.011 (.007)	.012 (.007)	.012 (.007)	.011 (.007)	.007 (.008)		
Upper secondary education	.007 (.007)	.003 (.007)	.007 (.007)	.005 (.007)	.007 (.007)	.007 (.007)	.006 (.007)	.002 (.007)		
Post-secondary education	.020** (.008)	.017* (.008)	.020** (.008)	.019** (.008)	.020** (.008)	.020** (.008)	.020** (.008)	.017** (.008)		
First-stage tertiary education	.008 (.008)	.004 (.008)	.009 (.008)	.006 (.008)	.008 (.008)	.008 (.008)	.008 (.008)	.005 (.008)		
Second-stage tertiary education	.012 (.014)	-.003 (.017)	.004 (.014)	.008 (.014)	.010 (.014)	.010* (.014)	.009 (.014)	-.004 (.017)		
Network	.081*** (.003)	.084*** (.003)	.080*** (.003)	.081*** (.003)	.081*** (.003)	.081*** (.003)	.081*** (.003)	.083*** (.003)		
Employment status	.116*** (.003)	.113*** (.003)	.116*** (.003)	.116*** (.003)	.117*** (.003)	.116*** (.003)	.116*** (.003)	.112*** (.003)		
Entrepreneurial confidence	.111*** (.003)	.112*** (.003)	.111*** (.003)	.110*** (.003)	.111*** (.003)	.111*** (.003)	.110*** (.003)	.111*** (.003)		

Entrepreneurial opportunity	.062*** (.003)	.062*** (.003)	.062*** (.003)	.061*** (.003)	.062*** (.003)	.062*** (.003)	.062*** (.003)	.061*** (.003)
Fear of failure	-.037*** (.003)	- (.003)	-.037*** (.003)	-.038*** (.003)	-.037*** (.003)	- (.003)	-.037*** (.003)	-.036*** (.003)
<b>Country level control variables</b>								
GDP per capita	.000 (.000)	-.000 (.000)	-.000* (.000)	.000 (.000)	.000 (.000)	.000 (.000)	-.000 (.000)	-.000*** (.000)
GDP per capita growth	.001 (.001)	-.003** (.002)	-.004*** (.001)	.002*** (.001)	.001 (.001)	.000 (.001)	-.000 (.001)	-.005*** (.002)
Unemployment	.000 (.002)	.001 (.002)	-.002 (.002)	-.002 (.002)	.000 (.002)	.001 (.002)	.000 (.002)	-.004** (.002)
Export	-.005*** (.001)	- (.001)	-.004*** (.001)	-.007*** (.001)	-.005*** (.001)	- (.001)	-.004*** (.001)	-.008*** (.002)
Natural resources	.006** (.003)	-.000 (.004)	-.014*** (.003)	.012*** (.003)	.006** (.003)	.004 (.003)	.006** (.003)	.003 (.005)
<b>Fixed parameter</b>								
Constant $\alpha_0$	.127** (.050)	.631*** (.081)	-.134*** (.057)	-.004 (.055)	.128** (.061)	.058 (.061)	.209*** (.054)	.109 (.158)

Notes: \*\*\* $p < 0.01$ , \*\* $p < 0.05$  and \* $p < 0.01$ . Standard error in parentheses.

Number of individual observations: 104,445. Number of countries: 26

## Appendix P – results of regression excluding bad controls

Table 19: regression results from the multilevel logistic regression with TEA as dependent variable and random slopes for female excluding the individual level control variables that might be a mechanism

Dependent variable = TEA	1	2	3	4	5	6	7	8	H
<b>Independent variables</b>									
Female	-.366*** (.039)	-.094 (.106)	-.246* (.143)	-.648*** (.091)	-.031 (.105)	-.423*** (.105)	-.238 (.195)	-.109 (.261)	H1
Government size		-.012 (.009)						-.018** (.009)	
Education			-.011 (.058)					-.012 (.062)	
Regulatory burden				-.047* (.027)				-.046* (.028)	
Government stability					-.374 (.652)			.038 (.781)	
Income regulations						-.005 (.005)		.003 (.005)	
Government support policies							-.330** (.133)	-.369** (.145)	
<b>Cross level interaction effect</b>									
Female * Government size		-.010*** (.004)						-.009** (.004)	H2
Female * Education			-.027 (.031)					.028 (.033)	H3
Female * Regulatory burden				.042*** (.012)				.026* (.014)	H4
Female * Government stability					-.639*** (.191)			-.318 (.280)	H5
Female * Income regulations						.001 (.002)		.000 (.002)	H6
Female * Government support policies							-.049 (.074)	-.062 (.077)	H7
<b>Individual level control variables</b>									
Age	-.008*** (.001)	-.008*** (.001)	-.008*** (.001)	-.008*** (.001)	-.008*** (.001)	-.008*** (.001)	-.008*** (.001)	-.008*** (.001)	
Entrepreneurial opportunity	.790*** (.019)	.789*** (.019)	.789*** (.019)	.789*** (.019)	.789*** (.019)	.789*** (.019)	.789*** (.019)	.789*** (.019)	
<b>Country level control variables</b>									
GDP per capita	-.000*** (.000)	-.000*** (.000)	-.000** (.000)	-.000*** (.000)	-.000 (.000)	-.000*** (.000)	-.000* (.000)	-.000* (.000)	
GDP per capita growth	-.031 (.041)	-.041 (.041)	-.031 (.042)	-.038 (.041)	-.030 (.041)	-.026 (.041)	-.016 (.039)	-.039 (.038)	
Unemployment	-.036 (.015)	-.025 (.017)	-.036** (.015)	-.038*** (.015)	-.037** (.015)	-.035** (.015)	-.042*** (.014)	-.028* (.015)	
Export	.001 (.003)	.002 (.003)	.001 (.003)	.001 (.003)	.001 (.003)	.000 (.003)	.000 (.002)	.002 (.003)	
Natural resources	-.010 (.015)	-.020 (.016)	-.010 (.015)	-.006 (.014)	-.011 (.015)	-.015 (.015)	-.002 (.014)	-.010 (.015)	
<b>Fixed parameter</b>									
Constant $\alpha_0$	-.311*** (.263)	-1.043*** (.326)	- (.359)	-.904** (.353)	-1.174*** (.364)	-1.047*** (.349)	-.535 (.398)	.258 (.535)	

<b>Variant parameters</b>								
Random intercept variance ( $var(u_{0j})$ )	.217*** (.045)	.207*** (.043)	.217*** (.045)	.209*** (.044)	.217*** (.045)	.212*** (.044)	.191*** (.040)	.168*** (.036)
Random slope variance ( $var(u_{1j})$ )	.052*** (.015)	.045*** (.013)	.051*** (.014)	.039*** (.012)	.038*** (.012)	.051*** (.015)	.051*** (.015)	.031*** (.010)
ICC	6.19%	5.92%	6.18%	5.97%	6.18%	6.05%	5.49%	4.86%

Notes: \*\*\* $p < 0.01$ , \*\* $p < 0.05$  and \* $p < 0.01$ . Standard error in parentheses. Number of individual observations: 118,795. Number of countries: 50

Table 20: odds ratio from the multilevel logistic regression with TEA as dependent variable and random slopes for female excluding the individual level control variables that might be a mechanism

Dependent variable = TEA	1	2	3	4	5	6	7	8	H	
<b>Independent variables</b>										
Female	.694*** (.027)	.911 (.097)	.782* (.112)	.523*** (.048)	.969 (.101)	.655*** (.069)	.788 (.153)	.896 (.234)		H1
Government size		.989 (.009)						.982** (.009)		
Education			.989 (.057)					.988 (.061)		
Regulatory burden				.954* (.026)				.955* (.027)		
Government stability					.688 (.449)			1.039 (.811)		
Income regulations						.995 (.005)		1.003 (.005)		
Government support policies							.719** (.095)	.691** (.100)		
<b>Cross level interaction effect</b>										
Female * Government size		.990*** (.004)						.991** (.004)		H2
Female * Education			.973 (.030)					1.028 (.033)		H3
Female * Regulatory burden				1.043*** (.013)				1.026* (.015)		H4
Female * Government stability					.528*** (.101)			.727 (.204)		H5
Female * Income regulations						1.001 (.002)		1.000 (.002)		H6
Female * Government support policies							.952 (.071)	.940 (.073)		H7
<b>Individual level control variables</b>										
Age	.992*** (.001)	.992*** (.001)	.992*** (.001)	.992*** (.001)	.992*** (.001)	.992*** (.001)	.992*** (.001)	.992*** (.001)		
Entrepreneurial opportunity	2.202*** (.041)	2.202*** (.041)	2.202*** (.041)	2.203*** (.041)	2.203*** (.041)	2.203*** (.041)	2.203*** (.041)	2.203*** (.041)		
<b>Country level control variables</b>										
GDP per capita	1.000*** (.000)	1.000*** (.000)	1.000** (.000)	1.000*** (.000)	1.000 (.000)	1.000*** (.000)	1.000* (.000)	1.000* (.000)		
GDP per capita growth	.970 (.040)	.960 (.039)	.969 (.040)	.962 (.039)	.970 (.040)	.974 (.040)	.984 (.039)	.961 (.037)		
Unemployment	.964** (.014)	.976 (.016)	.965** (.015)	.962*** (.014)	.964** (.014)	.966** (.014)	.959*** (.014)	.973* (.015)		
Export	1.001 (.003)	1.002 (.003)	1.001 (.003)	1.001 (.003)	1.001 (.003)	1.000 (.003)	1.000 (.002)	1.002 (.003)		
Natural resources	.990 (.014)	.980 (.016)	.990 (.014)	.994 (.014)	.989 (.015)	.985 (.015)	.998 (.014)	.990 (.015)		
<b>Fixed parameter</b>										
Constant $\alpha_0$	.270*** (.071)	.352*** (.115)	.283*** (.101)	.405** (.143)	.309*** (.113)	.351*** (.123)	.586 (.233)	1.294 (.692)		
<b>Variant parameters</b>										



Random intercept variance ( $var(u_{0j})$ )	.217*** (.045)	.207*** (.043)	.217*** (.045)	.209*** (.044)	.217*** (.045)	.212*** (.044)	191*** (.040)	.168*** (.036)
Random slope variance ( $var(u_{1j})$ )	.052*** (.015)	.045*** (.013)	.051*** (.014)	.039*** (.012)	.038*** (.012)	.051*** (.015)	.051*** (.015)	.031*** (.010)
ICC	6.19%	5.92%	6.18%	5.97%	6.18%	6.05%	5.49%	4.86%

Notes: \*\*\* $p < 0.01$ , \*\* $p < 0.05$  and \* $p < 0.1$ . Standard error in parentheses. Number of individual observations: 118,795. Number of countries: 50