

## **Economic Policy Uncertainty and Entrepreneurship: A Bad for a Good?**

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**Abstract:** The study examines the influences of the global/domestic economic policy uncertainty (EPU) on entrepreneurship in a sample of 23 economies over the period 2006-2016. Employing the two-step system general method of moment (GMM) estimation for unbalanced panel data, our study provides surprising evidence indicating that EPU may not always be harmful to entrepreneurship. Precisely, in contrast with existing literature emphasizing the negative impact of the uncertainty on entrepreneurship, our article suggests that EPU seems to boost pro-entrepreneurial social and cultural norms (i.e., encouraging actions for creation of new businesses). As such, we suggest that uncertainty may serve as an exogenous shock filtering "good" business ventures from "not-so-good" ones.

**Keywords:** Economic Policy Uncertainty; Entrepreneurship; Entrepreneurship Attitudes, Institutions.

**JEL code:** D81; L26; E02.

## 1. Introduction

The entrepreneurial sector (small and young businesses) plays a vital role in the process of economic growth both in developed and emerging countries. However, due to their newness and smallness liabilities, new ventures are very sensitive to the surrounding economic conditions and uncertainty (Ahunov and Yusupov, 2017). Meanwhile, the existing literature highlighted that macro uncertainty shocks exert strong negative effects on national outputs, employment, and productivity (e.g., see Karnizova and Li (2014), Caggiano et al. (2017), Fasani and Rossi (2018)). In this context, the link with entrepreneurship could be expected as follows: adverse economic outcomes reduce market demands and business opportunities, which subsequently lead to a reduction in the activeness of entrepreneurial activities.

This negative association between economic uncertainty and entrepreneurship has been taken for granted in the literature, either explicitly or implicitly, when scholars criticize the adverse impacts of shocks on the establishment and performance of new ventures (Bylund and McCaffrey, 2017). The mechanisms explaining for the negative effects are typically attributed to the deterioration of the economic conditions, the tightening of the consumption markets (Magd and McCoy (2014), and the shirking of the banking system (Markatou (2015).

While the indirect effects have been widely investigated and confirmed, the *direct* relationship between macro uncertainty and entrepreneurship is still under-investigated in the literature. Whereas we agree that stable economic and policy conditions are important to entrepreneurial activities, being inspired by the literature examining the rent-seeking behaviors of entrepreneurs (Torvik, 2002), we also suspect that economic uncertainty might bring about novel and rare opportunities since economic uncertainty is typically associated with a gradual switching of an economy to a new equilibrium (Strobel et al., 2018). This switching process inevitably creates gaps in the markets and generates new demands, which allow entrepreneurs to seek rents and extract profits (in a contemporary manner until the economy reaches the new equilibrium).

Given that there might be a positive effect of economic uncertainty on entrepreneurship, in this study, we aim at investigating the direct influence of the national and global uncertainty (EPU) on the activeness of entrepreneurship. Specifically, the hypothesis we seek to test is whether EPU always constrains local entrepreneurial activities or not. To be consistent with the literature on the topics, a negative association between the EPU and entrepreneurship is initially expected. However, we do not rule out the possibility that EPU might actually boost entrepreneurial activities.

To test the hypothesis, we examine a sample of 23 economies over the period 2006-2016. Employing the two-step system GMM estimation for unbalanced panel data to reduce concerns with endogeneity, we find that (1) EPU is negatively associated with the number of new business registered, however, (2) EPU is positively associated with total early-stage entrepreneurial activities (TEA), entrepreneurial intentions, and the level of innovation in an economy. These findings indicate that the average level of fear of failure increases and perceived opportunities decreases in the presence of uncertainty - however, this condition enhances entrepreneurial attitudes in the economy suggesting that only individuals with excellent ideas are confident to pursue entrepreneurial intentions in such an adverse condition.

These seemingly contrasting findings indicate that in uncertain conditions, entrepreneurs may be reluctant to formalize their venturing activities, presented by the reduction of the numbers of newly registered firms. However, their informal (early-stage) venturing activities are indeed evolved and become more active. We thus conclude that economic uncertainty is not always bad for entrepreneurship. In contrast, uncertainty may serve as an exogenous shock filtering "good" business ventures from "not-so-good" ones.

This study makes contributions to the entrepreneurial economics literature by showing that a naïve justification that EPU is "bad" since it discourages new business formations is not appropriate. When entrepreneurship is examined using informal early-stage activities, economic uncertainty may actually be a "good" condition that nurtures innovative and productive business ideas.

## **2. Literature Review**

### ***2.1. Economic Uncertainty***

Broadly speaking, uncertainty refers to a situation in which there is no basis for forming any calculable probability (Schinckus, 2009). Lawson (1985) suggested that economic agents become more skeptical in times of uncertainty. Economic uncertainty is a complex notion referring to a diversified reality that can take various forms in different countries. In this challenging context, economists work with socially constructed indicators to capture (partly) the feeling generated by economic uncertainty and understand its impact on economic activities. In this article, Economic Policy Uncertainty is defined as a policy-related index estimated through an aggregation of the newspapers coverage of policy-related economic uncertainty with the number of federal tax code provisions set to expire in future years and the disagreement among economic forecasters (Baker et al., 2016). The new EPU index actually generated much research and increasing attention to the

macroeconomic impacts of EPU on economic activities (Nguyen et al., 2020b, Nguyen et al., 2020a, Canh et al., 2019).

The literature documents EPU's adverse effects on business opportunities, including entrepreneurial investments (Bloom et al., 2007, Drobetz et al., 2018). Due to the importance of economic uncertainty, Baker et al. (2016) create the economic policy index and find that their new indicator is empirically correlated with a greater stock price volatility, reduced investment and employment in policy-sensitive sectors like defence, healthcare, finance, and infrastructure construction.

Generally speaking the existing literature supports the idea that a higher EPU would imply a greater uncertainty in the economy and, therefore, a fall in domestic economic activities. Such a reduction in domestic economic activities may then lead to a stagnant domestic economic performance in the future (Caggiano et al., 2017, Junttila and Vataja, 2018, Creal and Wu, 2017), and therefore to a potential decrease of entrepreneurial activities (Caggiano et al., 2017, Junttila and Vataja, 2018, Creal and Wu, 2017). In other words, one can reasonably expect that an increase in EPU would have a negative impact on the activeness of entrepreneurial activities. This expectation could actually be confirmed by the fact that a higher EPU usually has an adverse influence on the credit supply tightening, thereby entrepreneurial activities [Gissler et al., 2016]. Such context increasing the financial constraints and creating entry barriers for entrepreneurs has been observed in Oman (Magd and McCoy (2014) and Greece (Markatou (2015), for instance.

## **2.2. Entrepreneurship and Uncertainty**

The entrepreneurship has been studied through diverse lenses: its links to economic development (Toma et al., 2014, Li et al., 2012); innovations (Douglas and Prentice, 2019, Pedeliento et al., 2018); well-being (Bhuiyan and Ivlevs, 2018, Shir et al., 2018); poverty reduction (Halvarsson et al., 2018, Sutter et al., 2019); and even to environmental impacts (Heiskanen et al., 2019, Vernet et al., 2019).

Given the significance of entrepreneurship to socio-economic development, it is important to understand the determinants of entrepreneurship. Berglann et al. (2011), in a thorough study, suggest that key determinants of entrepreneurship are the occupational qualifications, family resources, gender, and work environments. Meanwhile, Simón-Moya et al. (2014) observed that entrepreneurship is significantly diversified in terms of activities making the phenomenon quite

complex. In relation to that, Castaño et al. (2015) emphasized that the studies dealing with entrepreneurship (and entrepreneurs' perceptions) should consider a framework of social, cultural, and economic factors. Simply relying on a single aspect (e.g., economic conditions) may lead to bias understanding of the motivation and performance of entrepreneurial activities.

Based on this holistic idea, Dedehayir et al. (2018) propose the concept of entrepreneurial ecosystem which is comprised of 'entrepreneurs', 'sponsors', and 'regulator'; while the latter includes the government and its policies to support and stimulate new venturing activities. Actually, government and its agents are often considered as an important partner in the innovation-entrepreneurship system (Dedehayir et al., 2018), especially in solving the externality issues (Ma et al., 2019, Lv, 2019). Recently, governments in both developed and developing countries started implementing many policies and projects aiming at stimulating entrepreneurial activities as a way of promoting economic development (Szirmai et al., 2011, Li et al., 2012). Interestingly, Islam (2015) identified two opposite trends in the relationship between entrepreneurship and the government: on the one hand, government spending may crowd-out entrepreneurship activities; on the other hand, an increase in the share of social and public goods might crowd-in entrepreneurship activities. These opposite trends indirectly refer to a subtle balance between the need for a supporting presence of government (through actions and institutions) and the necessity of flexibility/undefined room for entrepreneurial activities to emerge. In relation to that, Bylund and McCaffrey (2017) emphasized that institutions and uncertainty are two vital concepts in the literature dealing with entrepreneurship. While many studies have focused on exploring the association between institutions (both formal and informal) and entrepreneurship, few studies have been done on the effective link with economic uncertainty. This article aims at filling this gap by investigating the influence of EPU on entrepreneurial activities (both formal and informal).

### **3. Macro-economic context**

Our study period (2006-2016) witnessed several shocks in the economic policy the major one being the 2008 global financial crisis. *Figure 1* shows the evolution of the global and domestic EPU for each country (by year).

[Figure 1]

This figure shows that there was high volatility across countries and the globe. The UK, China, France, Germany, Brazil, or Canada are among the highest volatile countries in term of EPU.

Meanwhile, global EPU has significantly increased after the 2008 global financial crisis. Since our objective is to analyze the impact of this uncertainty on entrepreneurship, it is interesting to compare these numbers with the ones related to entrepreneurial activities, as suggested in *Figure 2* below.

[Figure 2]

The entrepreneurial activities showed in the figure have evolved remarkably during the period. Precisely, the Figure 2a presents the total number of newly registered businesses of each country – one can observe that, except for the case of Russia, the countries with highest numbers are among advanced ones such as UK, Australia, Hong Kong. The Figure 2a also shows that the total number of new businesses is increased in the period of study across sample excluding some cases such as France, Brazil, India, Spain, Hong Kong which witnessed a decrease as an impact of the 2008 Global financial crisis. The figure 2b shows the entrepreneurship density (i.e., total new registered businesses per 1000 population in the age of 15-64) shows that Hong Kong is the country with the highest number of entrepreneurship intensity. Australia, UK, Singapore are the following ones. Interestingly, we also observe an increasing trend in the UK, Australia, Hong Kong, Korea, Chile, Singapore, while it witnessed decreasing or fluctuating trends in Brazil, France, Germany, Greece, Ireland, Japan, Mexico, Russia, and Spain. These numbers show that role of economic uncertainty in supporting entrepreneurialism differs from countries to countries – some culture may be more supportive of taking the risk in uncertain environment whereas some others may not be risk-averse (see Singh et al. 2017 for further information on this aspect).

[Figure 3]

*Figures 3* illustrates other aspects of entrepreneurship: the dynamics of the total early-stage entrepreneurial activity, innovation index and entrepreneurship as a good career choice, respectively, from the database of Global Entrepreneurship Monitor (GEM) and from Global Entrepreneurship Research Association (GEM, 2018).<sup>1</sup> These graphs indicate some differences in terms of entrepreneurship attitudes and conditions between the different countries. Let us investigate these numbers in more details. The next section presents in detail our methodology and data treatment.

#### **4. Methodology and Data**

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<sup>1</sup> Other indicators are presented in Figure A1 and A2, Appendix.

#### 4.1. Model

The existing literature identified the following important determinants of entrepreneurship (see Sobel (2008)) namely income level (*Income*), population in age 15-64 (*Youngpop*), urbanization (*Urban*), financial development (*Credit*), industrialization (*Industry*), FDI inflows (*FDI*), trade openness (*Trade*), and governance quality (*Gov*) (see, Wang et al. (2019)). In addition to these key factors, Carlsson et al. (2013) noted that entrepreneurial activity is a dynamic process; thus, a dynamic panel estimator should be employed through the following equations:

$$Entre_{it} = \beta_1 Entre_{it-1} + \beta_2 Income_{it} + \beta_3 Youngpop_{it} + \beta_4 Credit_{it} + \beta_5 Industry_{it} + \beta_6 Urban_{it} + \beta_7 FDI_{it} + \beta_8 Trade_{it} + \beta_9 Gov_{it} + \varepsilon_{it} \quad [1]$$

in which:  $i$  denotes country,  $t$  year, and  $\varepsilon$  is the residual term. Afterwards, we extend this conceptual framework by integrating a proxy of EPU. Precisely, the changes in economic policy uncertainty (*EPU*) are added to Eq. [1] as an augmented factor of interest.

$$Entre_{it} = \beta_1 Entre_{it-1} + \beta_2 Income_{it} + \beta_3 Youngpop_{it} + \beta_4 Credit_{it} + \beta_5 Industry_{it} + \beta_6 Urban_{it} + \beta_7 FDI_{it} + \beta_8 Trade_{it} + \beta_9 Gov_{it} + \beta_{10} EPU_{it} + \varepsilon_{it} \quad [2]$$

In a static perspective, there may be a disadvantage in including nine control variables as determinants of entrepreneurial activities since some of them may have no significant impact. However, our study deals with the dynamics of entrepreneurial activities (described by the dynamic estimate in Eq. [1]) so that the inclusion of these control variables can actually help to understand the evolution of entrepreneurial activities through the way residuals evolve from year to year – to put it in other words, a variable might have an influence some years on not others, and its inclusion in the equation [2] allow us to capture this effect by limiting potential bias due to the omitted variables in our estimations. The following section details our data collection and their estimations.

#### 4.2. Data and estimations

Due to the availability of the EPU variables, an unbalanced panel dataset of 23 countries over the period 2006-2016 is employed. The new business creation is a salient feature of entrepreneurship (Munemo, 2017); thus, the number of newly registered business (*Entre1*) and the number of newly registered business per thousand population in age 15-64 (*Entre2*) (in logarithms) are used as the two main dependent variables. In addition, we also employ a set of 15 indicators of entrepreneurial attitudes (*EntreAt1* to *EntreAt15*) and 12 indicators of entrepreneurial conditions

(EntreCon1 to EntreCon12) from Global Entrepreneurship Monitor dataset (GEM, 2018) as alternative measures of entrepreneurship. It is noteworthy that Entre1 and Entre2 are the measures of formal entrepreneurial activities (i.e., business registration). Meanwhile, sub-indicators in the GEM such as total early-stage entrepreneurial activities (TEA) and entrepreneurial intentions are measures of informal (early stage) entrepreneurial activities.

The monthly data of domestic EPU of 23 countries and the global EPU from the Economic Policy Uncertainty website<sup>2</sup> are employed and transformed into yearly mean and yearly standard deviation, and then to annual percentage changes, which serve as a proxy for the changes in level and in the volatility of global/domestic EPU.

Our control variables, namely national average income, population, industrialization, urbanization, financial development, FDI, and trade openness, are collected from WDIs, World Bank. The governance quality indicators are from WGI (World Bank). *Table 1* presents the variable definitions and summary statistics.

[Table 1]

Entrepreneurship is strongly linked to social-economic factors leading to potential endogenous issues related to the reverse effects of the dependent variable on the independent variables. To deal with this potential problem, we use the system GMM estimator, developed by Blundell and Bond (1998) commonly used to solve such issue - however, system GMM model may produce biases of uncorrected standard errors when the instrument count is high. To solve this, the two-step system GMM estimator developed by Windmeijer (2005) is employed as recommended by the specialized literature.

## 5. Results

This section is structured into two steps: an analysis of the influence of EPU on new firm establishments and an analysis of the impact of EPU on entrepreneurship attitudes.

### 5.1. *EPU and New Business Creation*

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<sup>2</sup> [www.policyuncertainty.com](http://www.policyuncertainty.com)



Our full estimation model (Eq. [2]<sup>3</sup>) has been regressed in accordance with the methodology detailed in the previous section. Our full model is presented in Table 2.<sup>4</sup>

[Table 2]

### 5.1.1. Control variables and base-line model performance

Regarding our control variables, the real GDP per capita (*Income*) has a significant negative impact on both entrepreneurs (*Entre1*) and entrepreneurship intensity (*Entre2*). This means that a country with higher income level would witness less new business creation and less new business creation per 1000 population in age 15-64. The industrialization (*Industry*) appears to have an insignificant negative impact on the two aspects of entrepreneurship so that no conclusion can be drawn from these observations. In terms of demographic factors, the population in age 15-64 (*Youngpop*) has a significant positive impact on entrepreneurship while the urbanization (*Urban*) exerts a positive impact as well. This means that countries with a larger portion of the population in age 15-64 and a higher level of urbanization would have higher entrepreneurial activities – such results are quite expected and intuitive.

Meanwhile, financial development (*Credit*) appears to have a negative influence on entrepreneurship, implying that financial development cannot be perceived as a positive catalyst for entrepreneurial activities. This is an interesting observation since it contradicts the literature claiming that entrepreneurship activities are, by definition, small venture in need of credit facility to run their business. Our findings result from the way we defined Credit and our sample. Precisely, our sample is mainly composed of advanced and developing countries, where large corporations have significant market power and where the development of the financial sector is often associated with the development of financial markets. As such, to some extent, our findings indicate that the latter tends to favor large firms and do not provide enough support for entrepreneurship activities (Meltzer, 1960, Behr et al., 2013). The globalization including FDI inflows (*FDI*) and trade openness (*Trade*) appears to have mixed results: FDI inflows have a positive impact on the number of new business creation (*Entre1*), but they have a negative influence on the entrepreneurship intensity

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<sup>3</sup> The population in age 15-64 variable will be dropped out of the estimation for entrepreneurship intensity (*Entre2*) since it is in the calculation of dependent variable.

<sup>4</sup> We also operated robustness checks that have been confirmed for all control variables – results can be provided on request. Furthermore, our two-step system GMM estimators are unbiased and consistent estimations as the AR(2) test and Hansen test are insignificant in all estimations.

(*Entre2*). This result can be understood as follows: FDI inflows increase business opportunities for inhabitants while they reduce the diversification of business opportunities for existing entrepreneurs because FDI is usually associated with more regulated and therefore well-defined activities. Interestingly, trade openness has the opposite effect simply because trade openness is associated with significantly more products\services, thereby enlarging entrepreneurial opportunities. However, a higher degree of trade openness does not bring fresh capital into the country and therefore, does not contribute to the creation of new entrepreneurial activities.

Finally, institutional quality (*INST*) has a positive impact on both entrepreneurship and entrepreneurship intensity as expected since entrepreneurs feel more confident to start a business in a well-defined context in which they have a channel to interact\complain.

### 5.1.2. Main Results

Our main explanatory variables including the annual changes in yearly mean and yearly standard deviations of domestic EPU (*EPUm* and *EPUvo*) as well as the global EPU (*GEPUm* and *GEPUvo*) were added into the equations one by one to examine their marginal influences on entrepreneurship.

First, the increase in the yearly mean of domestic EPU (*EPUm*) has a significant negative impact on both entrepreneurship (*Entre1*) and entrepreneurship intensity (*Entre2*). This observation implies that an increase in domestic EPU reduces entrepreneurial activities. In other words, domestic uncertainty keeps potential entrepreneur far away from the implementation of their ideas. This observation confirmed the other results that we found: the increase in the yearly standard deviation of domestic EPU (*EPUvo*) has an insignificant negative impact on entrepreneurship but a significant negative impact on entrepreneurship intensity. These findings are in line with our previous remark. Interestingly, when both changes in level and in the volatility of domestic EPU are added together into the estimations, both have a negative influence on entrepreneurship, confirming that an increase in either level or volatility of the domestic EPU exerts adverse impacts on entrepreneurial activities.

Second, an increase in the yearly mean of global EPU (*GEPUm*) has a significant negative impact on the entrepreneurship and entrepreneurship intensity. Meanwhile, the increase in the yearly standard deviation of global EPU (*GEPUvo*) has an insignificant negative impact on entrepreneurship and a significant negative impact on entrepreneurship intensity. Consistently, when we add both changes in level and volatility of global EPU into the model, both variables have a

negative influence on the entrepreneurship and entrepreneurship intensity. These findings were expected and confirm the existing literature on the topic. The following section will offer more interesting and unexpected results.

## **5.2. EPU and Entrepreneurship Attitudes**

We estimate here the effects of EPU on entrepreneurship attitudes. The summary of regression results is presented in Table 3. The full regression results are available in the Appendix, Table A5-A8.

[Table 3]

First, an increase in the yearly mean of domestic EPU (*EPU<sub>m</sub>*) has a significant negative impact on the perceived opportunities (*EntreAt1*), while it has a significant positive impact on the fear of failure rate (*EntreAt3*). This implies that the higher domestic EPU would induce the fear of failure in entrepreneurial activities and reduce the perceived opportunities for the entrepreneurship. Other aspects of entrepreneurship attitudes are impacted by an increase in the level of domestic EPU with mixed signs and insignificant statistics.

Interestingly, although an increase in the yearly standard deviation of domestic EPU (*EPU<sub>vo</sub>*) has a significant positive influence on the fear of failure rate (*EntreAt3*) suggesting that entrepreneurs would not dare to start a new business; this volatility of the domestic EPU might also encourage entrepreneurship in some other ways since it has significant positive influences on Entrepreneurial intentions (*EntreAt4*), the Total early-stage Entrepreneurial Activity (TEA) (*EntreAt5*), High Status to Successful Entrepreneurs (*EntreAt14*), and the Entrepreneurship as a Good Career Choice (*EntreAt15*).

Our findings imply that an increase in the volatility of domestic EPU (or an increase in the risk of the uncertainty) generates a schizophrenic context in which, on the one hand, domestic EPU induces a particular reduction of formal entrepreneurial activities. However, on the other hand, it might create more informal, early-stage, risk-taking venturing activities through the pathway of entrepreneurship with a higher probability of success.

The influence of global EPU on entrepreneurship attitudes is consistent with the influence of domestic EPU with more significant impacts. Specifically, an increase in the yearly mean of global

EPU (*GEPUm*) has a significant negative impact on the perceived opportunities (*EntreAt1*), Female/Male TEA (*EntreAt9*), and business services sector (*EntreAt13*).

Meanwhile, it has a significant positive impact on fear of failure rate (*EntreAt3*), the total early-stage entrepreneurial activity (TEA) (*EntreAt5*), and high status to successful entrepreneurs (*EntreAt14*). Interestingly, an increase in the yearly standard deviation of global EPU (*GEPUvo*) has a significant positive influence on most of the variables indicating informal entrepreneurial activities such as entrepreneurial intentions (*EntreAt4*), the total early-stage entrepreneurial activity (TEA) (*EntreAt5*), high status to successful entrepreneurs (*EntreAt14*), entrepreneurship as a good career choice (*EntreAt15*), and especially innovation (*EntreAt12*). These findings confirm the stronger influence of global EPU on entrepreneurial activities than the domestic EPU.

What is surprising in the influence of (global and domestic) EPU on the entrepreneurship is that uncertainty seems to boost pro-entrepreneurial social and cultural norms (i.e., encouraging early-stage actions for creation of new businesses). Specifically, the coefficients associated with high status to successful entrepreneurs and entrepreneurs as a good career choice variables are positive and statistically significant, which are consistent with the increase in entrepreneurial intentions and the total early-stage entrepreneurial activity (TEA).

In light of these findings, we conclude that while EPU reduces the number of newly (formal) registered businesses, it significantly boosts entrepreneurial intentions and early-stage entrepreneurial activities. The negative association between uncertainty and the number of registered businesses is probably due to the unfavorable formal institutions under highly uncertainty situations (e.g., higher taxes, less government support). Meanwhile, the positive association between uncertainty and entrepreneurial intentions is attributed to the development of favorable informal institutions (e.g., social acceptance of entrepreneurship as a good career under economic uncertainty situation).

## **6. Implication and Conclusion**

This study provides a set of robust and consistent evidence showing that EPU may not always be harmful to entrepreneurship. Precisely, in contrast with the existing literature emphasizing the negative impact of the uncertainty on entrepreneurial activities, our study suggests that global and domestic EPU seems to boost pro-entrepreneurial social and cultural norms (i.e., encouraging actions for creation of new businesses). In other words, uncertainty may serve as an exogenous shock

filtering "good" business ventures from "not-so-good" ones. Indeed, the average level of fear of failure increases and perceived opportunities decreases in the presence of uncertainty. However, this condition enhances entrepreneurial attitudes in the economy, indicating that only individuals with excellent ideas are confident to pursue entrepreneurial intentions in such an adverse condition. Therefore, the reduced number of registered firms under the presence of uncertainty does not necessarily indicate a shirking of entrepreneurship. Uncertainty leads to *soft* support – informal institutions (e.g., social acceptance) associated with challenging conditions, which may nurture innovative and cutting-edge business ideas.

This study provides some important implications for policymakers concerned with boosting entrepreneurship in the situation of economic uncertainty. It is noteworthy that uncertainty serves as a generator of novel and innovative ideas that match new demands and changing market structures. Many of these ideas may not find a chance to be formalized due to the lack of resources and government support during the economic uncertainty period (Berg, 2019). As such, governments should maintain their support to the entrepreneurial sector as a way to reduce the negative impacts of economic uncertainty on the economy as a whole. When being properly financed and assisted, entrepreneurs may successfully realize their business ideas, which may provide more efficient ways to allocate resources and help stabilize the shocks created by the uncertainty.

This study is not without limitations that should be acknowledged, but they also provide potential avenues for future research. First, the study period in this study is limited due to the availability of the economic uncertainty variables. Moreover, the degree and types of economic uncertainty may be different between country to country in the covered period as well as from time-to-time. As such, one should not take this as one and unproblematic variable as if that would exert the same effect at all circumstances. Future studies, therefore, should extend the proposed theoretical framework and re-test it using a long-term dataset and in different contexts. The long-term effects of economic uncertainty are currently largely unexplored. Second, the dataset employed in this study is quite small. Future research should thus re-test the validity of our findings using a larger dataset with more observations. Finally, this is a country-level study which may suffer from aggregation biases. Future study may design questionnaires that capture other dimensions of economic and policy uncertainty and test their association with entrepreneurship at the firm level or individual level, which would allow a deeper understanding of the impact of uncertainty on socio-economic growth.

*The data that support the findings of this study are available from the corresponding author upon reasonable request.*

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**Table 1. Variables, Calculations, Description**

<b>Variable</b>	<b>Calculations</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Entre1	Log of New businesses registered (number)	212	11.004	1.094	7.227	13.405
Entre2	Log of New business density (new registrations per 1,000 people ages 15-64)	212	0.849	1.477	-3.212	3.484
Income	Log of GDP per capita (constant 2010 US\$)	253	10.072	0.947	6.952	11.155
Youngpop	Log of Total Population ages 15-64	253	17.354	1.508	14.898	20.719
Credit	Log of Domestic credit to private sector (% of GDP)	245	4.575	0.534	2.955	5.452
Industry	Log of Industry (including construction), value added (% of GDP)	250	3.184	0.365	1.905	3.862
Urban	Log of Urban population (% of total)	253	4.336	0.238	3.387	4.605
FDI	Foreign direct investment, net inflows (% of GDP)	253	7.078	11.917	-1.503	87.443
Trade	Log of Trade (% of GDP)	253	4.228	0.702	3.096	6.093
INST	Average of six institutional indicators	253	0.846	0.792	-0.759	1.832
Concor	Control of Corruption	253	0.951	1.025	-1.132	2.313
Goveff	Government Effectiveness	253	1.065	0.780	-0.471	2.437
Politic	Political Stability and Absence of Violence/Terrorism	253	0.305	0.796	-1.902	1.496
Requa	Regulatory Quality	253	1.058	0.770	-0.521	2.261
Law	Rule of Law	253	0.973	0.907	-0.970	2.038
Voice	Voice and Accountability	253	0.722	0.808	-1.749	1.690
EPUm	The annual percentage change of Yearly mean of Economic Policy Uncertainty	253	3.088	25.258	-113.454	105.486
EPUvo	The annual percentage change of Yearly Standard deviation of Economic Policy Uncertainty	253	3.122	12.693	-33.158	45.492
GEPUm	The annual percentage change of Yearly mean of Global Economic Policy Uncertainty	253	3.443	13.740	-19.222	29.828
GEPUvo	The annual percentage change of Yearly Standard deviation of Global Economic Policy Uncertainty	253	4.269	10.809	-12.626	25.542

**Table 2. Economic Policy Uncertainty and Entrepreneurship**

<b>Model:</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>	<b>(7)</b>	<b>(8)</b>	<b>(9)</b>	<b>(10)</b>	<b>(11)</b>	<b>(12)</b>
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Dep. Var:	<i>Entre1</i>						<i>Entre2</i>					
<b>L.Entre1</b>	<b>0.9149***</b> [0.0175]	<b>0.9191***</b> [0.0168]	<b>0.9127***</b> [0.0218]	<b>0.8739***</b> [0.0188]	<b>0.8967***</b> [0.0160]	<b>0.8888***</b> [0.0285]						
<b>L.Entre2</b>							<b>0.9750***</b> [0.0149]	<b>0.9698***</b> [0.0140]	<b>0.9623***</b> [0.0142]	<b>0.9351***</b> [0.0128]	<b>0.9602***</b> [0.0151]	<b>0.9437***</b> [0.0134]
<b>Income</b>	<b>-0.0742***</b> [0.0217]	<b>-0.0589***</b> [0.0183]	<b>-0.0721***</b> [0.0205]	<b>-0.0277</b> [0.0172]	<b>-0.0381**</b> [0.0137]	<b>-0.0297*</b> [0.0161]	<b>-0.0641**</b> [0.0247]	<b>-0.0502*</b> [0.0247]	<b>-0.0638**</b> [0.0265]	<b>-0.0408</b> [0.0245]	<b>-0.0304</b> [0.0275]	<b>-0.0645**</b> [0.0308]
<b>Industry</b>	<b>-0.0382</b> [0.0488]	<b>-0.0260</b> [0.0479]	<b>-0.0298</b> [0.0485]	<b>0.0447</b> [0.0611]	<b>0.0015</b> [0.0521]	<b>0.0666</b> [0.0598]	<b>-0.0463</b> [0.0282]	<b>-0.0361</b> [0.0342]	<b>-0.0390</b> [0.0350]	<b>-0.0486*</b> [0.0238]	<b>-0.0150</b> [0.0318]	<b>-0.0214</b> [0.0339]
<b>Youngpop</b>	<b>0.0456***</b> [0.0074]	<b>0.0404***</b> [0.0070]	<b>0.0440***</b> [0.0130]	<b>0.0581***</b> [0.0109]	<b>0.0460***</b> [0.0079]	<b>0.0529***</b> [0.0141]						
<b>Urban</b>	<b>0.2249***</b> [0.0486]	<b>0.1980***</b> [0.0477]	<b>0.2327***</b> [0.0558]	<b>0.1607**</b> [0.0590]	<b>0.1740***</b> [0.0503]	<b>0.1357*</b> [0.0659]	<b>0.1333***</b> [0.0419]	<b>0.1181***</b> [0.0408]	<b>0.1486***</b> [0.0466]	<b>0.1327***</b> [0.0401]	<b>0.0969**</b> [0.0438]	<b>0.1554***</b> [0.0471]
<b>Credit</b>	<b>-0.0077</b> [0.0351]	<b>-0.0049</b> [0.0361]	<b>-0.0023</b> [0.0353]	<b>0.0611**</b> [0.0250]	<b>0.0268</b> [0.0339]	<b>0.0496</b> [0.0346]	<b>-0.0490**</b> [0.0181]	<b>-0.0556***</b> [0.0174]	<b>-0.0408*</b> [0.0213]	<b>-0.0391**</b> [0.0176]	<b>-0.0630***</b> [0.0161]	<b>-0.0408**</b> [0.0171]
<b>Trade</b>	<b>0.0111</b> [0.0467]	<b>0.0038</b> [0.0396]	<b>-0.0005</b> [0.0435]	<b>-0.1139**</b> [0.0474]	<b>-0.0379</b> [0.0385]	<b>-0.1079**</b> [0.0448]	<b>0.1040***</b> [0.0241]	<b>0.0860***</b> [0.0254]	<b>0.0705**</b> [0.0296]	<b>0.0429</b> [0.0300]	<b>0.0532</b> [0.0329]	<b>0.0532</b> [0.0336]
<b>FDI</b>	<b>0.0002</b> [0.0041]	<b>0.0006</b> [0.0036]	<b>0.0008</b> [0.0039]	<b>0.0111***</b> [0.0033]	<b>0.0039</b> [0.0035]	<b>0.0117***</b> [0.0034]	<b>-0.0075**</b> [0.0029]	<b>-0.0058*</b> [0.0032]	<b>-0.0051</b> [0.0033]	<b>-0.0016</b> [0.0025]	<b>-0.0025</b> [0.0035]	<b>-0.0010</b> [0.0029]
<b>INST</b>	<b>0.0861**</b> [0.0384]	<b>0.0714*</b> [0.0362]	<b>0.0810**</b> [0.0382]	<b>0.0169</b> [0.0225]	<b>0.0409</b> [0.0289]	<b>0.0234</b> [0.0233]	<b>0.1053***</b> [0.0299]	<b>0.1089***</b> [0.0283]	<b>0.1178***</b> [0.0290]	<b>0.0985***</b> [0.0255]	<b>0.1010***</b> [0.0244]	<b>0.0989***</b> [0.0275]
<b>EPUm</b>	<b>-0.0005***</b> [0.0001]		<b>-0.0004**</b> [0.0002]				<b>-0.0005**</b> [0.0002]		<b>-0.0003</b> [0.0002]			
<b>EPUvo</b>		<b>-0.0005</b> [0.0004]	<b>-0.0001</b> [0.0006]					<b>-0.0014***</b> [0.0004]	<b>-0.0010*</b> [0.0005]			
<b>GEPUm</b>				<b>-0.0015***</b> [0.0003]		<b>-0.0016***</b> [0.0005]				<b>-0.0023***</b> [0.0004]		<b>-0.0023***</b> [0.0005]
<b>GEPUvo</b>					<b>-0.0010</b> [0.0006]	<b>-0.0001</b> [0.0008]					<b>-0.0020***</b> [0.0005]	<b>0.0002</b> [0.0006]
N	188	188	188	188	188	188	188	188	188	188	188	188
Countries	20	20	20	20	20	20	20	20	20	20	20	20
No of IVs	21	21	22	21	21	22	21	21	22	21	21	22
AR(2) test (p-value)	0.647	0.670	0.645	0.614	0.662	0.619	0.824	0.843	0.871	0.952	0.873	0.942
Hansen test (p-value)	0.603	0.434	0.588	0.377	0.322	0.376	0.604	0.429	0.593	0.261	0.375	0.379

Note: Standard errors are in []; \*, \*\*, \*\*\* are significant levels at 10%, 5%, 1%, respectively.

**Table 3. Economic Policy Uncertainty and Entrepreneurship Attitudes (summary from Table A5, A6 in Appendix) and Entrepreneurship Conditions (summary from Table A7, A8 in Appendix)**

Part A: Economic Policy Uncertainty and Entrepreneurship Attitudes									
	Motivational Index	Entrepreneurial Employee Activity	Established Business Ownership	Total early-stage Entrepreneurial Activity (TEA)	Entrepreneurial intentions	Fear of failure rate	Perceived capabilities	Perceived opportunities	
	EntreAt8	EntreAt7	EntreAt6	EntreAt5	EntreAt4	EntreAt3	EntreAt2	EntreAt1	
Entrepreneurship Conditions	+	+	+	+	-	+ <sup>a</sup>	-	- <sup>b</sup>	
Economic Policy Uncertainty	+	+	+	+ <sup>a</sup>	+ <sup>b</sup>	+ <sup>a</sup>	+	-	
Economic Policy Uncertainty	-	-	+	+ <sup>b</sup>	+	+ <sup>a</sup>	-	- <sup>a</sup>	
Economic Policy Uncertainty	+	+	+	+ <sup>a</sup>	+ <sup>a</sup>	+ <sup>a</sup>	-	+	

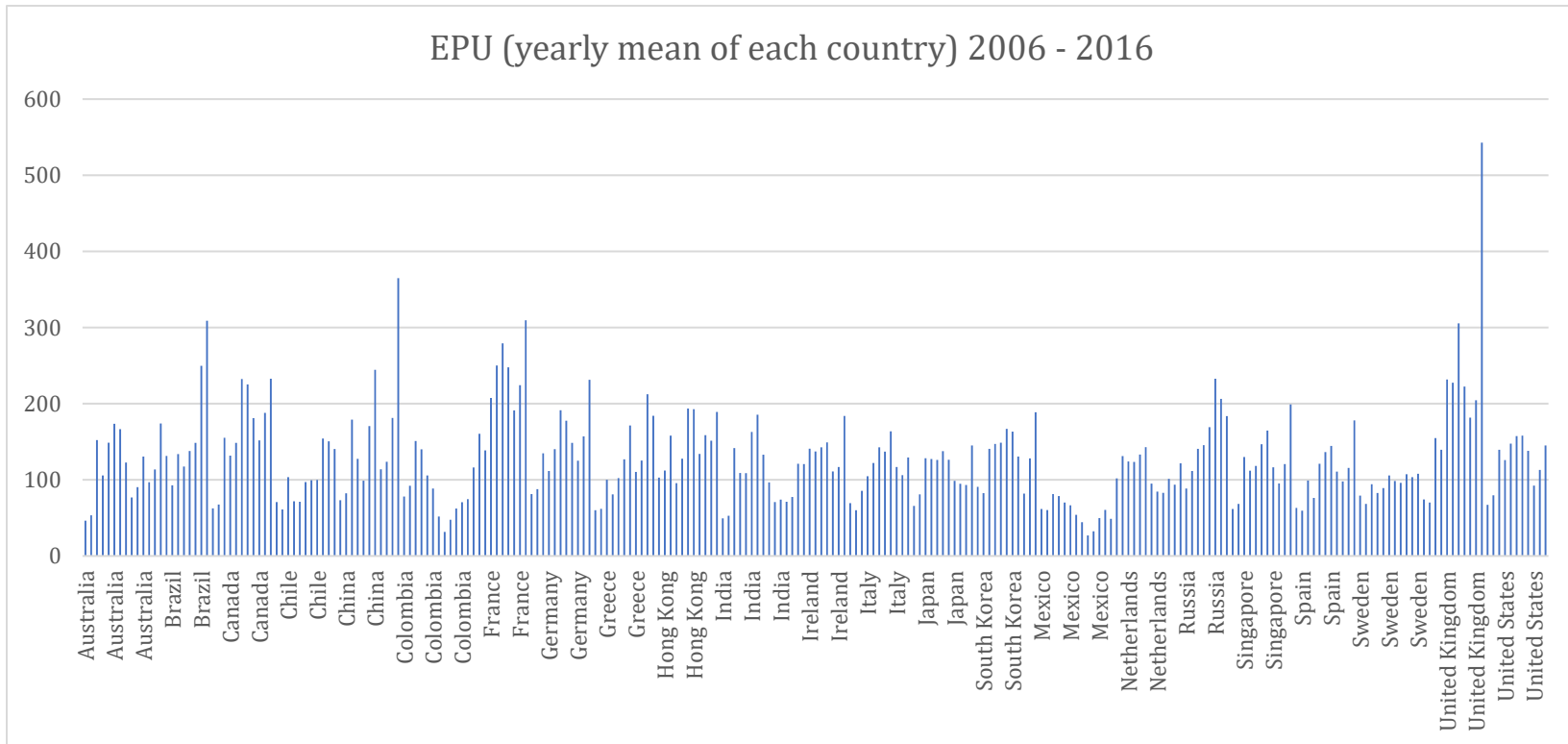
Entrepreneurship as a Good Career Choice	EntreAt15 EntreAt15	-	+	+	+
High Status to Successful Entrepreneurs	EntreAt14 EntreAt14	-	+ <sup>a</sup>	+ <sup>c</sup>	+ <sup>a</sup>
Business Services Sector	EntreAt13 EntreAt13	-	- <sup>a</sup>	- <sup>a</sup>	- <sup>a</sup>
Innovation	EntreAt12 EntreAt12	+	-	+	+ <sup>a</sup>
High Job Creation Expectation	EntreAt11 EntreAt11	+	-	-	-
Female/Male Opportunity-Driven TEA	EntreAt10 EntreAt10	+	-	-	-
Female/Male TEA	EntreAt9 EntreAt9	-	+	- <sup>a</sup>	- <sup>b</sup>
<b>Entrepreneurship Attitudes:</b>	<b>Dep. Var:</b>	<b>EPU m</b>	<b>EPU vo</b>	<b>GEP Um</b>	<b>GEP Uvo</b>

**Part B: Economic Policy Uncertainty and Entrepreneurship Conditions**

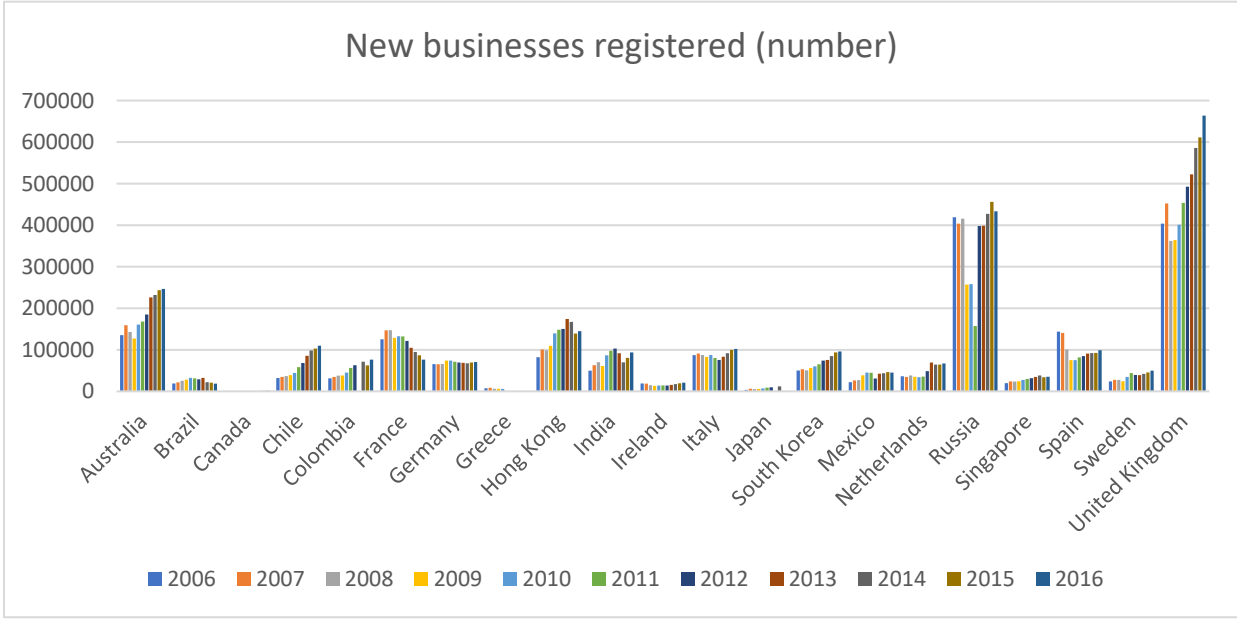
Post school entrepreneurial education and training	EntreCon6 EntreCon6	-
Basic school entrepreneurial education and training	EntreCon5 EntreCon5	-
Governmental programs	EntreCon4 EntreCon4	+
Taxes and bureaucracy	EntreCon3 EntreCon3	+ <sup>a</sup>
Governmental support and policies	EntreCon2 EntreCon2	-
Financing for entrepreneurs	EntreCon1 EntreCon1	+
<b>Entrepreneurship</b>	<b>Dep. Var:</b>	<b>EPU m</b>

<b>EPUvo</b>	+	-c	+a	-	-	+
<b>GEPUm</b>	-a	+	+c	-	-b	-c
<b>GEPUvo</b>	+	-	+a	+	+a	+c
<b>Entrepreneurship conditions:</b>	R&D transfer	Commercial and professional infrastructure	Internal market dynamics	Internal market openness	Physical and services infrastructure	Cultural and social norms
Dep. Var:	EntreCon7	EntreCon8	EntreCon9	EntreCon10	EntreCon11	EntreCon12
<b>EPUm</b>	-	+	-	+a	+	+a
<b>EPUvo</b>	-	-b	-	-	+	+
<b>GEPUm</b>	-	-c	+	-b	-	+c
<b>GEPUvo</b>	+	-a	+	+	-	+a

Note: +, - are the signs of coefficients; a, b, c denotes the significant levels at 1%, 5%, and 10%, respectively.

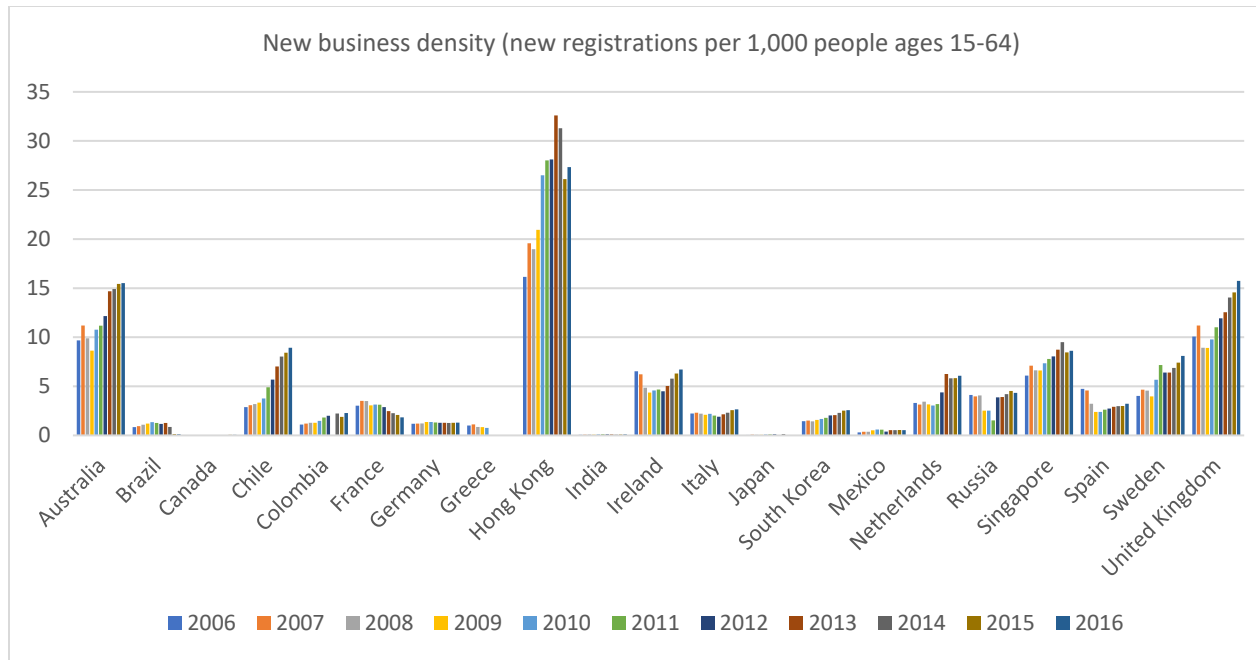


**Figure 1. Economic Policy Uncertainty (2006-2016)**



2a) New businesses



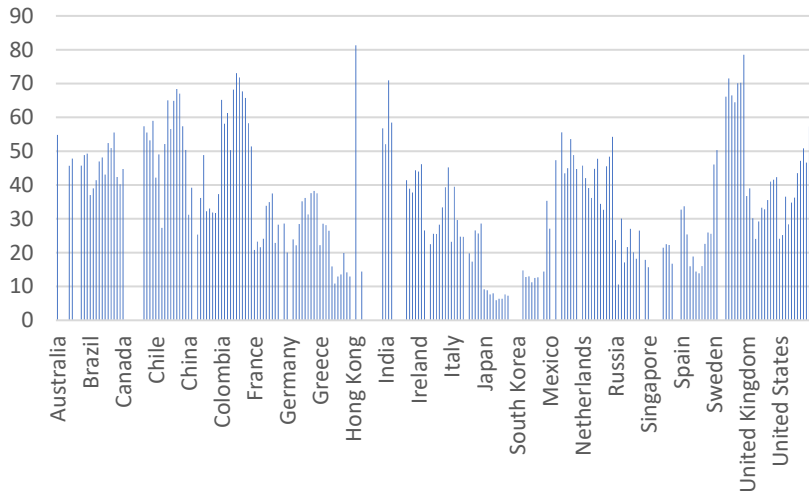


2b) New Business density

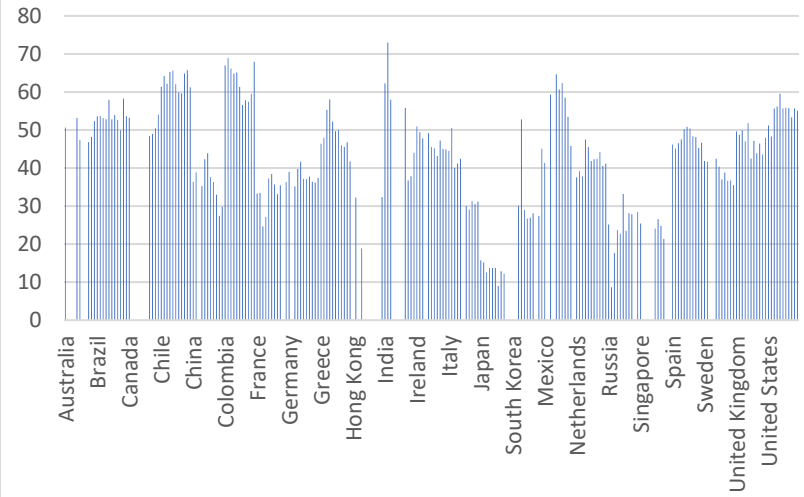
**Figure 2. Entrepreneurship across the globe (2006-2016)**

*Note: Data on entrepreneurship from WDIs is not available in cases of China and the US.*

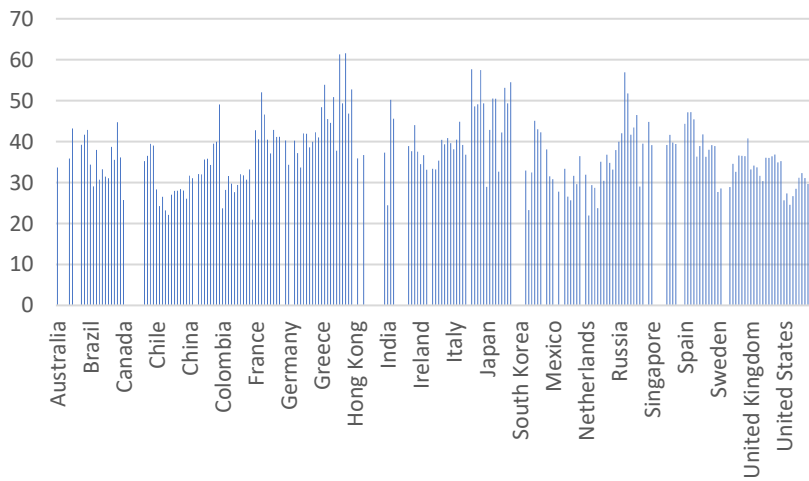
Perceived opportunities



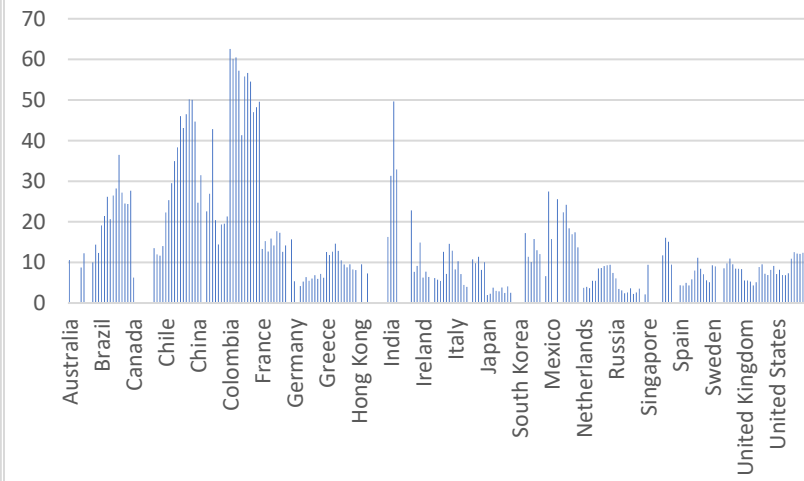
Perceived capabilities



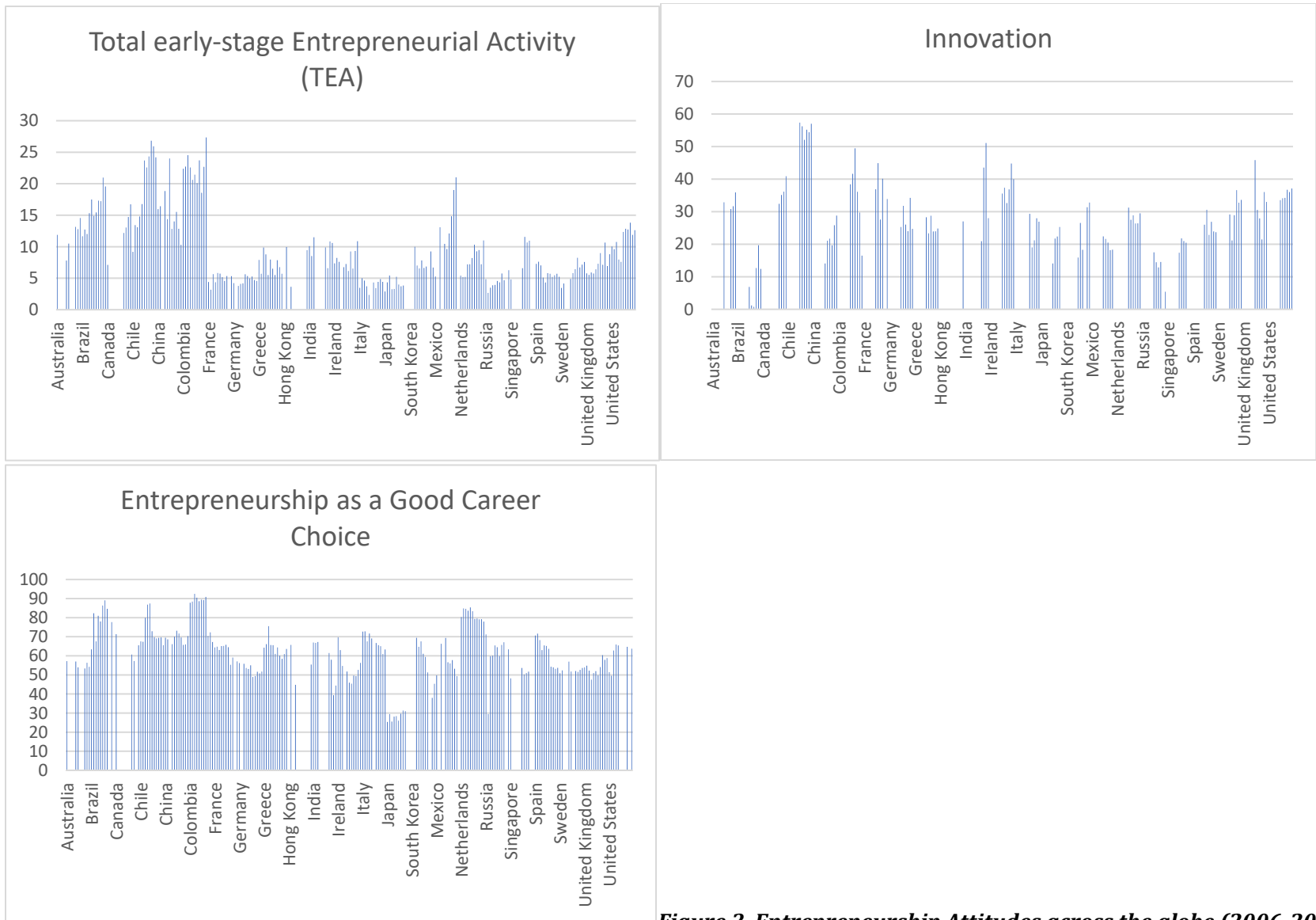
Fear of failure rate



Entrepreneurial intentions







**Figure 3. Entrepreneurship Attitudes across the globe (2006-2016)**