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# Perceptions, Expectations, and Entrepreneurship: The Role of Extreme Events

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# Perceptions, Expectations, and Entrepreneurship: The Role of Extreme Events

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# ABSTRACT

## Perceptions, Expectations, and Entrepreneurship: The Role of Extreme Events*

We provide, for the first time, comparative evidence of the impact of various types of extreme events – natural disasters, terrorism, and violent conflicts – on the perceptions of entrepreneurs concerning some key entrepreneurial issues – such as fear of failure in starting a business venture, whether individuals expect that good opportunities are likely to emerge in the next six months, and the expected level of competition stemming from creating new ventures. The occurrence of extreme events is likely to be exogenous to the perceptions affecting it so that we can identify a causal link from events to entrepreneurs and their perceptions. Using individual-level data from 43 countries from the period 2002 to 2005, we find that neither indicator of the intensity of extreme events has a significant impact on entrepreneurial activity, when country characteristics are not controlled for. Once invariant country characteristics are taken into account, we find that *Terrorist Attacks* have a positive and significant impact on business creation, *Natural Disasters* have a positive and negative impact on entrepreneurial activity, and *Violent Conflict* has no significant effect. These results are consistent with differential impacts of extreme events on perception variables such as *Fear of Failure, Expected Business Opportunities*, and *Expected Level of Competition*. Our results suggest that extreme events, while costly at the aggregate level, may induce a positive response in terms of entrepreneurial activity in specific circumstances. There is hence scope for entrepreneurs, and policies supporting them, to create growth from the ruins of extreme events.

JEL Classification: D84, D22, M13, L26, O12

Keywords: natural disaster, terrorism, violent conflict, entrepreneur

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# 1. Introduction

Among the suggested correlates of entrepreneurial activity are both measurable, identifiable characteristics - such as age, gender, education, and income -, and subjective perceptions and expectations, which are hard to observe and difficult to alter. Ultimately, entrepreneurship is the ability to identify and take advantage of unexploited business opportunities. To be able to do so, individuals need to balance opportunities, risk,[1] fear of failure, and confidence in their own skills. Entrepreneurs create and implement new production "functions" under conditions of uncertainty, both extrinsic and related to their environment, and intrinsic, related to their view of themselves and their abilities.[2] In the process leading to new venture creation, information, risk tolerance, expectations and perceptions are the basis for decision making by entrepreneurs. These factors cannot easily be changed through business development policies or even education.

Extreme events such as natural disasters, terrorist attacks, and violent conflict have the potential to impact psychologically the population of whole countries, affecting both their expectations and their perceptions.[3] These events are generally associated with an immediate cost in terms of decreases in investment and per capita GDP, as well as higher levels of uncertainty.[4] The impact of extreme events on expectations and perceptions may actually be more important than the more visible direct consequences in form of material destruction.[5] In addition to inducing an aggregate cost in terms of output loss, such extreme events may – or may not – discourage the creation of new businesses and entrepreneurial activity in general. We posit that extreme events drive individual perceptions and expectations of risk and reward and thus alter the willingness to create new businesses.

The set of drivers of entrepreneurial activity identified in the literature are associated with intrinsic and extrinsic factors. As extrinsic factors, on the one hand, there are socio-economic conditions – as in Lefkowitz (1994) -, family status – Justo et al (2006) -, human and social capital – Greene (2000) -, age, and education – Minniti and Nardone (2007) and Llussá (2009). On the other hand, a number of papers have addressed intrinsic factors associated with perceptions and expectations. An example is

[1] This includes, but is not limited to, assessing the emergence of new opportunities and the expected level of competition.

[2] Appropriately, Kirzner (1979) equated a talent for entrepreneurship with "alertness".

[3] Voors et al. (2010) conduct experimental field work in Burundi and find evidence that individuals exposed to greater levels of violence display are more risk seeking and have higher discount rates. The authors claim their results are consistent with the idea that preferences are endogenous and respond to life experience and context. In addition, adverse temporary shocks can have long-term consequences through the induced response of preferences.

[4] For general surveys of the economics of terrorism, see Brück and Wickström (2004), Brück, Karaisl and Schneider (2008) and Llussá and Tavares (2008). See also Sandler (2009) for a prospective view of the evolving literature and Brück (2007) for a comprehensive volume. These studies emphasize that terrorists aim to have a wider impact on the economy beyond those directly affected by the attacks. See Stewart and FitzGerald (2001), Collier et al. (2003), Verwimp et al. (2009) and Bozzoli et al. (2010b) for the effects of war on the economy. Bozzoli et al. (2010c) analyze the impact of conflict on entrepreneurial activity. Tierney and Webb (2001) discuss the impact of natural disasters on business activity, and Tavares (2004) estimates the impact of natural disasters on economic growth, when compared to terror attacks and other shocks.

[5] The degree of material destruction may vary significantly between these three types of events. However, all are bound to have significant aggregate "psychological" impacts on the population.

the literature explaining gender differences in nascent entrepreneurship. Minniti and Nardone (2007) claims that gender attitudes toward entrepreneurship reflect mostly subjective perceptions, not objective conditions. Subjective perceptions include individual self-confidence on having the appropriate skills to start a business and fear of failure, while expectations are associated with the likely emergence of opportunities and market competition.[6]

We focus in our analysis on two related concepts, namely "perceptions" and "expectations". The former refers to ability or the process of understanding by means of the senses - it hence points to a subjective and highly variable process across individuals. People have different abilities and sensory capabilities - hence perceptions are likely to differ across people, all other things being equal. The latter refers to an act or a process of anticipation - that is a view of the future held by an individual. In statistics and economics, the expectations operator of course defines the product of the probability of an event occurring and the value of that event, summed over all possible events. The two concepts hence have related but different meanings. Furthermore, extreme events may impact differently on these two concepts, thus making a differentiation between these concepts worthwhile.

Perceptions and expectations may differ from actual abilities and risk levels and are often biased. Busenitz and Barney (1997) and Cooper et al. (1988) suggest that, while common to all individuals, these distortions may actually be particularly prevalent among entrepreneurs. For instance, as entrepreneurs associate their perceived entrepreneurial capabilities as a signal of likely success and are "overly" receptive to entrepreneurial opportunities. It is highly likely that extreme events- natural disasters, terrorist attacks, and conflict – change these perceptions. This papers tests precisely that hypothesis. This is key as the literature on entrepreneurship views perception variables as all but invariant over time. As to expectations, the literature ignores the possibility of aggregate events that may substantially alter how entrepreneurs as a whole evaluate risk, opportunities, and levels of competition.

The fact that natural disasters, terrorism, and violent conflict have been found to have a negative impact on growth and income per capita, is perfectly consistent with the possibility that extreme events encourage entrepreneurial activity and new business creation.[7] Natural disasters, terrorist attacks, and violent conflict may either discourage or encourage entrepreneurial activity.[8] On the negative side, the actual destruction involved may impair business activities and, as such, discourage the creation of new ventures.[9] In addition, the uncertainty created by current and future violence and the

[6] As in Minniti and Nardone (2007) and Llussá (2009).

[7] Blattman and Miguel (2010) argue that the impact of civil war on institutions, technology, and culture, all determinants of long-term economic performance, is still far from well understood. Bozzoli et al. (2010a), show that, in spite of increased pessimism in the short term, individuals cope with conflict intensity, presumably by adopting appropriate strategies.

[8] Entrepreneurial activity is not necessarily associated with higher income, as suggested by the well documented fact that some extremely poor countries display very high levels of business creation. As recognized in the literature, entrepreneurial activity may be a side-effect, a response to crises, poor institutions, or even a business climate that discourages formal activities.

[9] Gaibulloev and Sandler (2008) suggest that terrorism and other violent events may hinder growth by raising the costs of businesses – in wages, insurance premiums, and security expenditures -, which reduce profits and returns and discourage new business creation. Tierney and Webb (2001) find that, though there are "insulating factors", such as firm size, which partially protect incumbent firms from the negative

implicit threat to property rights in extreme events should discourage the incentive to invest and create new businesses. Another possibility is that destruction reinforces unequal distribution of resources, including income and power.[10] Lastly, these events induce a governmental response, which arises naturally from the need to coordinate the social response and, sometimes, the actual reconstruction effort. Increased state intervention may indirectly discourage business creation, through discretionary behavior and unwarranted regulation.[11]

But extreme events may also encourage new businesses. The disruption of customary habits and the weakening of traditional institutions create opportunities and may change the balance of power in favor of smaller, more flexible, organizations.[12] Moreover, as "incumbent" businesses suffer the brunt of physical destruction, new opportunities open for emerging competitors.[13] In addition, after a violent event, governments and state institutions may actually improve how they deal with business and the business climate itself may improve as a consequence.[14] Finally, the need to summon new physical – and psychological – energies may favor the emergence of hitherto untapped private initiative.[15]

Using individual-level data from 43 countries from the period 2002 to 2005, we find that extreme events do affect individual perceptions and expectations, such as Fear of Failure, Perceived Business Skills, Expected Business Opportunities, and Expected Level of Competition. Natural Disasters and Terrorist Attacks increase Fear of Failure, while Violent Conflict decreases it. None of the extreme events examined has a significant impact on Perceived Business Skills. As to expectations related to market conditions, Natural Disasters and Violent Conflict are associated with significant increases in Expected Business Opportunities and decreases in the Expected level of Competition. These differential impacts of extreme events on perception and expectation variables lead to different impacts on entrepreneurial activity. For the whole sample of individuals, Natural Disasters and Terrorist Attacks have a significant impact on new business creation, respectively negative and positive. Natural Disasters discourage mostly females, the old and low-income individuals. Terrorist Attacks affect

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effects of disasters, the latter may exacerbate the difficulties that businesses were already experiencing on a daily basis.

[10] Bircan et al. (2009) report rising levels of inequality during war, and especially in the early period of post-war reconstruction. See also Tierney and Webb (2001) which, as mentioned above, suggests larger firms suffer relatively less in the wake of natural disasters.

[11] Llussá and Tavares (2010) examine the impact of terror attacks on different macroeconomic aggregates and find that, in several instances, government spending increases after a terrorist event.

[12] Alesch et al. (2001) show that precautions to protect life and property within a disaster area are not correlated with post-disaster business survival, suggesting more complex mechanisms are at work and need to be considered, rather than the mere material impact of disasters. Bennett and Estrin (2006) suggest that there might be a decrease in market entry requirements and a lower cost of discovery of profitable business activities.

[13] Alesch et al. (2001) find that, while local business organizations that are "marginal" may not reopen, stronger businesses also lose market share both in regional and national markets.

[14] There is evidence that disasters expose corruption and may lead, indirectly, to better decision making. See, for instance, Bellows and Miguel (2006), and Blattman (2009).

[15] Tierney and Webb (2001) suggest that, to the extent that disasters bring new resources into the affected communities, with the potential for providing a stimulus to new business activity. Bozzoli et al. (2010c) study individuals affected by violence in Colombia and find that, while high homicide and displacement rates decrease self-employment at the local level, a high influx of displaced persons raises the probability of self-employment at the municipality of destination.

positively the entrepreneurial activity of all population groups, but the high income, poorly educated, and the young are those where the quantitative impact is strongest.

This article contributes to the literature in two ways. First, it builds on the recognizably important role of perceptions and expectations as determinants of entrepreneurial activity and identifies exogenous extreme events as an instance where perceptions and expectations are likely to change. In fact, natural disasters, terrorism, and violent conflict have at least as much of a psychological as a material impact. The nature and magnitude of these events is largely exogenous, allowing a proper identification of their impact on perceptions and entrepreneurship.[16] In this paper we estimate how these events affect individual traits and expectations, which may then impact entrepreneurial activity. Second, the article provides quantitative estimates of the relative impact of the intensity of extreme events on entrepreneurial activity, and its differential effect across population groups.[17]

The remainder of the paper is organized as follows. Section 2 introduces the data, section 3 discusses the specification and section 4 presents the results. Section 5 concludes.

## 2. Data

In our empirical analysis we will draw on data from the Adult Population Surveys, collected by the Global Entrepreneurship Monitor (GEM). This data contain detailed information on individuals from 44 countries. The micro survey data is collected annually and in a consistent manner across countries.[18] In this paper we use yearly data from 2002 to 2005.[19] The GEM data set include measures of perception variables related to entrepreneurship such as fear of failure (individuals who answer that fear of failure can prevent them to start a new business), business opportunities (individuals that answered yes there will be good opportunities for starting a business in the area where they live in the next six months) and competition (individuals that think there are many businesses offering the same products or services to their potential customers). The variables are defined in Appendix I.

We will analyze the effect on these perception variables of aggregate shocks: the data on number of affected people in terrorist attacks, in natural disasters, and an index of war conflict. We can assess whether an individual is starting a new business, owns or manages a young firm measured by the total entrepreneurship rate (TEA), and take into account personal characteristics such as age, income and education.

[16] In the case of terrorism, terrorists actually have an incentive to make attacks appear random in order to maximize the "audience's" anxiety, making risks seem ubiquitous and unpredictable, as suggested in Gaibulloev and Sandler (2008).

[17] A recent paper that assesses the relative impact of terrorist activity and violent conflict on growth is Gaibulloev and Sandler (2008).

[18] Each year a sample of at least 2,000 randomly selected individuals in each country are surveyed by phone or through face-to-face interviews. On average, a total of 35 national experts in each country are responsible for conducting the surveys. A coordination team at London Business School supervises the data collection and checks for inconsistencies.

[19] This is the set of surveys available to researchers who not directly involved in the GEM project, and also those for which the methodology is most consistent across time.

The summary statistics are shown in Table 1. We have that 8.4% of our sample are entrepreneurs, the average age of individuals in the survey is 42.9 years old, 49.8% are males, 31.3 % have a secondary degree, 20.4% have post secondary education and 12.1 % have graduate experience. In terms of income, 35.1% consider themselves as belonging in the lowest 33% poorest, 35.9% consider themselves middle income and 29.0% consider themselves being among the 33% richest in the society. The perception variables we are analyzing are: fear of failure (34.7% consider that fear of failure prevent them from staring a business), good opportunity for starting a business in the area where they live in the next six months is considered by 34.4% of individuals, and competition (yes there are many businesses offering the same products or services to their potential customers): 48.2% of individuals think that there is competition.

As to the indicators of extreme events, we focus on the intensity of events as to the number of people affected. We use the absolute number of victims of terrorist attacks, people affected by natural disasters, and victims of violent conflicts. Our use of absolute rather than relative victimization is intentional and corresponds to the role of these events as modifiers of perceptions, for example as reported by the media. The traumatic and psychological impact of these events, we believe, is more directly associated with the absolute number of people affected, the size of the economy being mostly irrelevant.

# 3. Specification

We now formally analyze the effect of shocks on perception variables related to entrepreneurship and on entrepreneurship. Our dependent variables will be fear of failure, business opportunity in 6 months and expected competition and total entrepreneurship rate (TEA). Our independent variables will be terrorist attacks, natural disasters and violent conflict as well as individual characteristics (age, education and level of income) and country dummies. The dependent variables are binary,[20] and we use probit estimation and cluster standard errors at the country level. Our sample includes countries whose macroeconomic and institutional characteristics vary widely and may correlate with the entrepreneurship indices. However, we control for country specific characteristics by including country fixed effects in all our specifications. The sample includes 43 countries and the period is from 2002 to 2005.

For an individual i in country j at time t, we define the outcome of interest $y_{ijt}$ as fear of failure or business opportunity in 6 months or expected competition or TEA. Fear of failure is an indicator that takes the values 1 or 0, with the former indicating fear of failure. Perceived Business Skills indicates whether the individual thinks he or she has the appropriate skills to start a business. Expected Business Opportunity is an indicator which takes the values 1 or 0, with the former indicating a positive perception of existing business opportunities. Expected Level of Competition is an indicator which takes the values 1 or 0, with the former indicating many competitors. Finally, TEA is an indicator, which takes the values 1 or 0, with the former indicating entrepreneurial activity.

[20] The exception is Expected Level of Competition, which we transform into a binary variable by coding the "No Competition" and the "Some Competition" responses together, against the "Greta Competition" response.

We estimate the equation for $y_{ijt}$:

$$y_{ijt} := \alpha + \beta_1 . X_{ijt} + \beta_2 . S_{jt} + \eta_t + \varepsilon_{ijt} \quad (1)$$

where $\alpha$ is a constant, $X_{ijt}$ is a vector of individual characteristics - including age, education and income -, $S_{jt}$ is a vector of the aggregate shocks – terrorist attacks, natural disasters and violent conflict, which vary across countries and over time. Finally, $\eta_t$ is a vector of country dummies and $\varepsilon_{ijt}$ is a well-behaved error term. The coefficient on a variable such as "Terrorist Attacks", for instance, will give us the change in the probability of becoming an entrepreneur for the individual with the average characteristics in the sample.

# 4. Results

Table 2 reports the results of the Probit estimates where perception and expectation variables are the variable to be explained by a set of controls and indicators of the occurrence of extreme events. Natural Disasters and Terrorist Attacks increase the Fear of failure, while Violent Conflict decreases it. None of the categories of extreme events have a significant effect on individual perception of the appropriateness of their business skills. Finally, both Natural Disasters and Violent Conflict lead individuals to expect an increase in business opportunities, as well as decrease in competition.

In sum, extreme events tend to lead individuals to perceive new opportunities and a lower level of competition, but raise the fear of failing in a new business venture. As to the control variables, age is associated with less Fear of Failure and lower Expected Business Opportunities. Male individuals have lower fear of failing, a greater confidence in their skills, and a higher number of expected business opportunities. Perception and expectation variables also vary with education and household income.

In Table 3 we investigate the determinants of Total Entrepreneurial Activity. In other words, taking into account the results of Table 3 above, we would expect that the occurrence of violent events may affect entrepreneurial activity though, given the contradictory impacts of extreme events on individual perceptions and expectations, we do not know what to expect in terms of new business creation. For the sake of robustness, we examine the impact of extreme events on the entrepreneurship rates of different population groups – defined according to gender, education, household income, and age. We find that Natural Disasters and Violent Conflicts tend to discourage entrepreneurial activity, while Terrorist Attacks increase it for all population groups.

Figure 1 plots the product of the sample standard deviation of Terrorist Attacks, as reported in Table 2, by the coefficients on the variable from Table 3. We find that the estimated impact of terrorist events is quantitatively significant, at about a tenth of average entrepreneurship rates in the sample. In addition, the size of the effect is quite robust across population groups, though those with little education and the young respond more positively to this extreme event. Natural Disasters particularly discourage business creation by females, the high income, and the young. Violent Conflict

discourages business creation by males, the high income, and the old. The control variables are in line with previous studies of the determinants of entrepreneurial activity.[21]

In sum, we find evidence of differential impact of extreme events on the business activities of population groups. As far Terrorist Attacks are concerned, we find that their negative impact on national income and growth is not associated with lower entrepreneurial activity. Endogenous individual responses, as captured in Table 3, or unobserved events at the national level that correlate with terror attacks, may explain these results.

# 5. Conclusions

We conduct an investigation of the impact of the intensity of extreme events – Natural Disasters, Terrorist Attacks and Violent Conflict – on perceptions and expectations that may affect entrepreneurial activity, as well as on entrepreneurial activity itself. We find that, contrary to expectations, Terrorist Attacks have a positive, significant, and robust impact on entrepreneurial activity, while Natural Disasters and Violent Conflict tend to impact entrepreneurial activity negatively. Our results suggest that, while imposing aggregate costs in terms of growth and per capita income at the country level, extreme events may provoke a positive entrepreneurial response in some cases. It is important that future research investigates how this positive response may be encouraged, and thus be used to mitigate the effect of these negative extreme events, as well as encourage economic growth in the long-run.

[21] See, for instance, Llussá (2009).

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# Appendix I
# Variable Definition

**Total Entrepreneurial Activity**
**Units:** Individual dummy variable. Takes the value 1 if individuals are either starting a new business including any self-employment, selling any goods or services to others or are owners and managers of a young firm, 0 otherwise.
**Source:** Global Entrepreneurship Monitor (GEM).

**Terrorist Attacks**
**Unit:** Total number of affected individuals, that is, sum of fatalities with injured.
**Source:** Global Terrorism Database.

**Natural Disasters**
**Unit:** Total number of individuals affected by the natural disaster.
**Source:** International Disaster Database

**Violent Conflict**
**Unit:** Dummy taking the value 1 if violent conflict – internal to the country or external – has a death toll of up to 1000, 0 otherwise. No occurrences of severe violent conflict, with death toll above 1000, are registered in our sample.
**Source:**

**Fear of Failure**
**Units:** Individual dummy variable. Takes the value 1 when individuals answer that fear of failure can prevent them from starting a new business.
**Source:** Global Entrepreneurship Monitor (GEM).

**Perceived Business Skills**
**Units:** Individual dummy variable. Takes the value 1 when individuals answer that they feel they have the appropriate skills to start a new business.
**Source:** Global Entrepreneurship Monitor (GEM).

**Expected Business Opportunities**
**Units:** Individual dummy variable. Takes the value 1 when individuals answered yes there will be good opportunities for starting a business in the area where they live in the next six months.
**Source:** Global Entrepreneurship Monitor (GEM).

**Expected Level of Competition**
**Units:** Individual dummy variable. Takes the value 1 when individuals answered that there are many businesses offering the same products or services to their potential customers.
**Source:** Global Entrepreneurship Monitor (GEM).

**Age**
**Units:** Age of individual at time of interview. Years.
**Source:** Global Entrepreneurship Monitor (GEM).

**Low Income**
**Units:** Takes value 1 for individuals who report that their household income is in the lowest 33rd income percentile of their country's income distribution at the time of the interview.
**Source:** Global Entrepreneurship Monitor (GEM).

**Middle Income**
**Units:** Takes value 1 for individuals who report that their household income is in the middle 33rd income percentile of their country's income distribution at the time of the interview.
**Source:** Global Entrepreneurship Monitor (GEM).

**Upper Income**
**Units:** Takes value 1 for individuals who report that their household income is in the upper 33rd income percentile of their country's income distribution at the time of the interview.
**Source:** Global Entrepreneurship Monitor (GEM).

**Some Secondary**
**Units:** Takes value 1 for individuals with some exposure to secondary education.
**Source:** Global Entrepreneurship Monitor (GEM).

**High School**
**Units:** Takes value 1 for individuals with completed secondary education.
**Source:** Global Entrepreneurship Monitor (GEM).

**College**
**Units:** Takes value 1 for individuals with a college degree.
**Source:** Global Entrepreneurship Monitor (GEM).

**Graduate**
**Units:** Takes value 1 for individuals with some graduate school education.
**Source:** Global Entrepreneurship Monitor (GEM).

# Appendix II

## Table 1
## Summary Statistics

| | N. Obs. | Mean | Std. Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| **Fear of Failure** | 212513 | 0.3449577 | 0.4753556 | 0 | 1 |
| **Perceived Business Skills** | 212513 | 0.4683102 | 0.4989959 | 0 | 1 |
| **Expected Business Opportunities** | 212513 | 0.3443978 | 0.4751726 | 0 | 1 |
| **Expected Level of Competition** | 13973 | 0.4817863 | 0.499686 | 0 | 1 |
| **Total Entrepreneurship Rate** | 212513 | 0.0843619 | 0.2779304 | 0 | 1 |
| **Age** | 212513 | 42.75037 | 15.38603 | 14 | 98 |
| **Male** | 212513 | 0.4980354 | 0.4999973 | 0 | 1 |
| **Some Secondary Degree** | 212513 | 0.3573852 | 0.4792307 | 0 | 1 |
| **Secondary Degree** | 212513 | 0.3120327 | 0.4633242 | 0 | 1 |
| **Post Secondary Degree** | 212513 | 0.2038887 | 0.4028882 | 0 | 1 |
| **Graduate Experience** | 212513 | 0.1230936 | 0.3285454 | 0 | 1 |
| **Low Income** | 212513 | 0.3517667 | 0.4775227 | 0 | 1 |
| **Middle Income** | 212513 | 0.3581946 | 0.4794709 | 0 | 1 |
| **High Income** | 212513 | 0.2900387 | 0.453781 | 0 | 1 |
| **Terrorist Attacks** | 207583 | 9.52553 | 21.47465 | 0 | 95 |
| **Natural Disasters** | 210922 | 3428954 | 2.77e+07 | 0 | 2.85e+08 |
| **Violent Conflict** | 210922 | 0.0574715 | 0.2327418 | 0 | 1 |

**Note:** Countries: United States, Russia, South Africa, Greece, Netherlands, Belgium, France, Spain, Hungary, Italy, Switzerland, Austria United Kingdom, Denmark, Sweden, Norway, Poland, Germany, Peru, Mexico, Argentina, Brazil, Chile, Australia, New Zealand, Singapore, Thailand, Japan, South Korea, China, Canada, Uganda, Portugal, Ireland, Iceland, Finland, Croatia, Slovenia, Venezuela, Hong-Kong, Taiwan Jordan, Israel. Years: 2002 to 2005.

**Table 2**
**Perceptions, Expectations, and Extreme Events**
Probit Specification – With Country Dummies (2002 – 2005)

| Dependent Variable: | Perception Variables | | Expectation Variables | |
|---|---|---|---|---|
| | Fear of Failure | Perceived Business Skills | Expected Business Opportunities | Expected Level of Competition |
| | (1) | (2) | (3) | (4) |
| **Age** | -0.0015188*** | -0.0001306 | -0.0019575*** | 0.000076 |
| | (0.0004273) | (.0004211) | (0.0002727) | (0.0004384) |
| **Male** | -0.0683295*** | 0.1776841*** | 0.0747632*** | -0.0086546 |
| | (0.0075527) | (.0159278) | (0.0085032) | (0.0123974) |
| **Secondary Degree** | -0.0321021*** | 0.0691953*** | 0.0207884*** | -0.019578 |
| | (0.0055269) | (0.0098552) | (0.0083371) | (0.0171148) |
| **Post Secondary Degree** | -0.049601*** | 0.1219729*** | 0.0622393*** | -0.0724612*** |
| | (0.0057947) | (.01307) | (0.0108661) | (0.01706) |
| **Graduate Experience** | -0.0413104*** | 0.1618907 *** | 0.1138516*** | -0.070463*** |
| | (0.0083631) | (.0162677) | (0.0142712) | (0.0163746) |
| **Middle Income** | -0.0008915 | 0.0662008*** | 0.0269399*** | -0.0008777 |
| | (0.0040255) | (.0089627) | (0.0084679) | (0.0149044) |
| **High Income** | -0.0472911*** | 0.1497856 | 0.0717182*** | 0.0003058 |
| | (0.0082555) | (.0103642) | (0.0109773) | (0.0158246) |
| **Natural Disasters** | 1.51e-10*** | 7.75e-11 | 1.25e-10 * | -2.81e-10* |
| | (3.45e-11) | (1.10e-10) | (7.89e-11) | (1.49e-10) |
| **Terrorist Attacks** | 0.0001547*** | 0.0006108 | 0.0000441 | -0.0008897 |
| | (0.0001366) | (0.0004588) | (0.0003009) | (0.0005779) |
| **Violent Conflict** | -0.0058072** | 0.0039352 | 0.0432183* | -0.035383*** |
| | (0.0030382) | (0.0188181) | (0.0254658) | (0.0221763) |
| **N. Observations** | 207583 | 207583 | 207583 | 12960 |
| **N. Countries** | 44 | 44 | 44 | 44 |
| **Wald chi2** | 3437.96 | NO | 3124.53 | NO |
| **Pseudo R2** | 0.0126 | 0.0762 | 0.0552 | 0.0509 |
| **Log Pseudo-Likelihood** | -134726.72 | -132374.42 | -125776.04 | -8516.7342 |
| | -0.0015188*** | -0.0001306 | -0.0019575*** | 0.000076 |

**Note:** Significant at 1% (***), at 5% (**) and at 10% (*). Standard errors in parenthesis adjusted for clustering by country.

**Table 3**
**Entrepreneurship and Extreme Events**
Probit Specification – With Country Dummies (2002 – 2005)

| **Dependent Variable: Total Entrepreneurial Activity** | **Whole Sample** | **Males** | **Females** | **With Education** | **Little or No Education** | **Low Income** | **High Income** | **Young** | **Old** |
|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (1) | (2) | (3) | (4) |
| **Age** | -0.0013529*** | -0.0018359*** | -0.0009165*** | -0.0014244*** | -0.0011972*** | -0.0012429*** | -0.001323*** | - | - |
| | (0.000107) | (0.0001347) | (0.0000904) | (0.0001496) | (0.000087) | (0.0000876) | (0.00022) | | |
| **Male** | 0.0379143*** | - | - | 0.0449262*** | 0.0265354*** | 0.0289241*** | 0.052784*** | 0.051831*** | 0.0262673*** |
| | (0.0023496) | | | (0.002359) | (0.002735) | (0.0023246) | (0.0029189) | (0.0040374) | (0.0013845) |
| **Secondary Degree** | 0.0126329*** | 0.0146082*** | 0.0111075*** | - | - | 0.0124002*** | 0.0110567*** | 0.0112411*** | 0.0155408*** |
| | (.0025699) | (0.0034175) | (0.0024873) | | | (0.0022392) | (0.004554) | (0.0051452) | (0.0032122) |
| **Post Secondary Degree** | 0.0248662*** | 0.0280388*** | 0.0228823*** | - | - | 0.0281234*** | 0.0120864 | 0.0210763*** | 0.0306672*** |
| | (.0042928) | (0.0054943) | (0.0038562) | | | (0.0047717) | (0.007738) | (0.0058934) | (0.0042894) |
| **Graduate Experience** | 0.0453407*** | 0.0531943*** | 0.0393493*** | - | - | 0.0573535*** | 0.0360364*** | 0.0395709*** | 0.051969*** |
| | (0.0055266) | (0.0065434) | (0.0054542) | | | (0.0074438) | (0.0071104) | (0.0080763) | (0.0045506) |
| **Middle Income** | 0.0108859*** | 0.0112718 *** | 0.0102509 *** | 0.0117311*** | 0.0106944*** | - | - | 0.0093476*** | 0.0141002*** |
| | (0.0025211) | (0.0038754) | (0.0019477) | (0.0030141) | (0.0025735) | | | (0.002977) | (0.0038724) |
| **High Income** | 0.0291197*** | 0.0375209*** | 0.0208178*** | 0.0324512*** | 0.0374612*** | - | - | 0.0277929*** | 0.0333982*** |
| | (0.003516) | (0.0052226) | (0.0023814) | (0.0036961) | (0.0045574) | | | (0.0046389) | (0.0050953) |
| **Natural Disasters** | -7.29e-11** | -4.51e-11 | -9.79e-11*** | 3.91e-11 | 1.14e-11 | -8.06e-13 | -7.46e-11** | -1.37e-10*** | -2.10e-11 |
| | (3.07e-11) | (3.06e-11) | (3.34e-11) | (3.96e-11) | (3.46e-11) | (2.97e-11) | (3.56e-11) | (4.37e-11) | (1.99e-11) |
| **Terrorist Attacks** | 0.0002892** | 0.0002969*** | 0.0002785** | 0.0003406*** | 0.0004195*** | 0.0002477 ** | 0.0003138 *** | 0.0003402** | 0.0002201*** |
| | (0.0001268) | (0.000114) | (0.0001398) | (0.0001262) | (0.0001434) | (0.0001302) | (0.0001183) | (0.0001559) | (0.0000893) |
| **Violent Conflict** | -0.0105974 | -0.0223472** | 0.0000185 | -0.0123867 | 0.0009648 | -5.44e-07 | -0.0229251*** | -0.011793 | -0.009453*** |
| | (0.0080711) | (0.010592) | (0.0047973) | (0.0076041) | (0.0143725) | (0.0141903) | (0.0029248) | (0.0138901) | (0.0033787) |
| **Nr of Observations** | 207583 | 103183 | 104400 | 133088 | 74309 | 72873 | 60298 | 97738 | 109845 |
| **Nr of Countries** | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 |
| **Wald chi2** | NO | NO | NO | NO | NO | NO | NO | NO | NO |
| **Pseudo R2** | -53529.325 | 0.0563 | 0.0799 | 0.0581 | 0.0967 | 0.0986 | 0.0507 | 0.0585 | 0.0702 |
| **Log Pseudo-Likelihood** | -132374.42 | -31940.883 | -21481.743 | -37970.152 | -15576.599 | -15394.434 | -19241.392 | -30345.421 | -23236.282 |

**Note:** Significant at 1% (***), at 5% (**) and at 10% (*). Standard errors in parenthesis adjusted for clustering by country.

**Figure 1**
**The Impact of Terrorist Attacks on Entrepreneurial Activity**
By Population Group