# Ethnicity, Gender, and Entrepreneurship in Guatemala

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## Abstract

I examine entrepreneurial activity among indigenous and non-indigenous people in Guatemala using GEM data for 2014. The results show that being indigenous is negatively correlated with being a nascent entrepreneur but positively correlated with being an established entrepreneur. This result suggests that once indigenous people start businesses the survival rate is higher than that of non-indigenous entrepreneurs. The presence of indigenous people increases as businesses reach more advanced phases of development (from nascent to new to established). The opposite holds for non-indigenous entrepreneurs. Multi-varied probit models confirm this finding.

## Introduction

To my knowledge this is the first study that examines entrepreneurship propensities among indigenous and non-indigenous peoples in Guatemala. The study is motivated in its objective and empirical strategy by Köllinger & Minniti (2006). Using GEM data for the United States for 2002 they study differences in the rate of entrepreneurship between black and white Americans. They argue:

> We find strong evidence that differences in subjective and often biased perceptions are highly associated with entrepreneurial propensity across these two racial groups. In addition, we find that black Americans tend to exhibit more optimistic perceptions of their business environment than other racial groups and are more likely than others to attempt starting a business. In fact, our results show that *blacks are almost twice as likely as whites to try starting a business*. Thus, our results suggest that the under representation of black Americans among established entrepreneurs is not due to lack of trying but may instead be due to stronger barriers to entry and higher failure rates. [Italics added]

My findings contrasts with those of Köllinger & Minniti in the sense that indigenous people in Guatemala for some reasons, which could be do to relatively low access to credit or with the prevalence of certain perceptual variables—as we will see below, do not start business as often as non-indigenous, but once they do their survivals rate, as indicated by their presence among established entrepreneurs, is higher.

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## The data

GEM survey has been conducted annually in Guatemala by the Kirzner Entrepreneurship Center at Francisco Marroquin University since 2009. For this article I use the most recent survey—2014, where there are 2158 observations.

Regarding the entrepreneurial status GEM survey classifies the interviewees as (a) not being entrepreneurs, (b) established business owners, (c) new business owners, and (d) nascent entrepreneurs.

A person is not an entrepreneur (noentre) if she is not involved in starting a new business neither owns an existing business.

An established business owner (established) is a person who is "currently owner-manager of an established business, i.e., owning and managing a running business that has paid salaries, wages, or any other payments to the owners for more than 42 months."[2]

A new business owners (new) is a person who is "currently a owner-manager of a new business, i.e., owning and managing a running business that has paid salaries, wages, or any other payments to the owners for more than three months, but not more than 42 months."[3]

A nascent entrepreneur (nascent) is a person "actively involved in setting up a business they will own or co-own; this business has not paid salaries, wages, or any other payments to the owners for more than three months."[4]

*Graph 1* shows the distribution of the entrepreneurial status in the GEM sample in Guatemala for 2014.

Graph 1

[2] From the document "Entrepreneurial Activity" in the official GEM website: http://www.gemconsortium.org/wiki/1150 (accessed on December 3, 2015
[3] *Ibid*
[4] *Ibid*

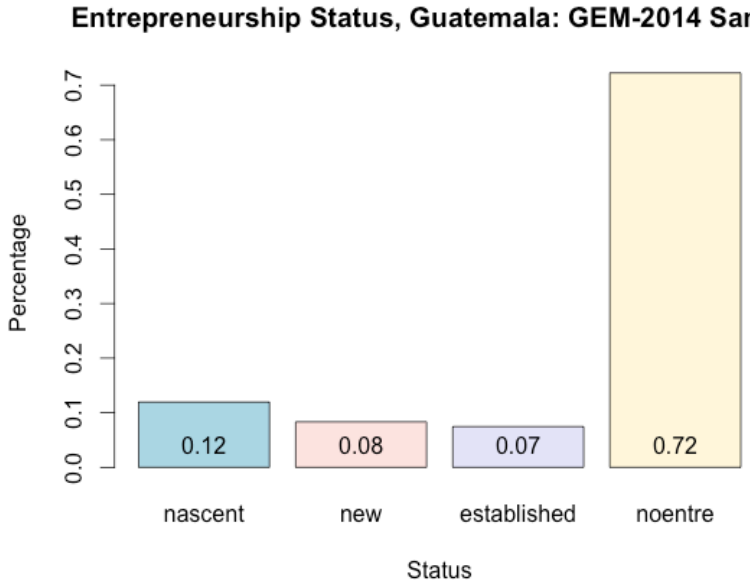


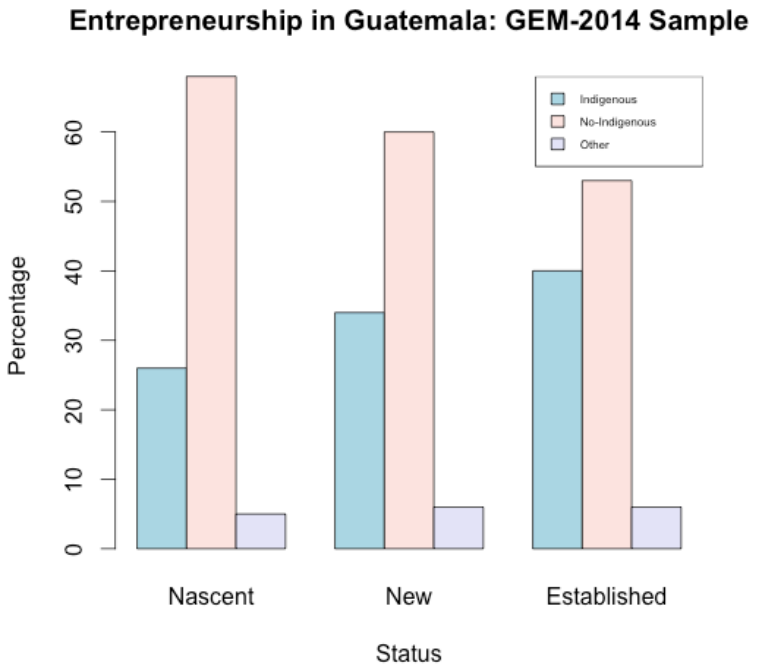

*Table* 1 shows the distribution of individuals in the sample according to ethnicity and entrepreneurial status.

Table 1

| | | Ethnicity | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Indigenous | % | No-indigenous | % | Others | % | Total | % |
| Status | Nascent | 68 | 9% | 176 | 14% | 14 | 10% | 258 | 12% |
| | % | 26% | | 68% | | 5% | | 100% | |
| | New | 62 | 9% | 108 | 8% | 10 | 7% | 180 | 8% |
| | % | 34% | | 60% | | 6% | | 100% | |
| | Established | 65 | 9% | 86 | 7% | 10 | 7% | 161 | 7% |
| | % | 40% | | 53% | | 6% | | 100% | |
| | No-entrepreneur | 521 | 73% | 930 | 72% | 108 | 76% | 1559 | 72% |
| | % | 33% | | 60% | | 7% | | 100% | |
| | Total | 716 | 100% | 1300 | 100% | 142 | 100% | 2158 | 100% |
| | % | 33% | | 60% | | 7% | | 100% | |

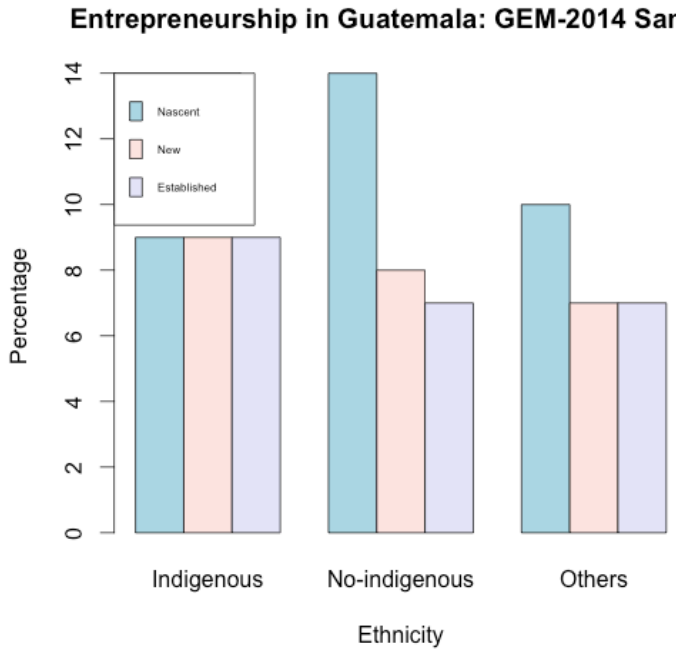
*Graph 2* shows the presence of indigenous and non-indigenous people in each phase of entrepreneurship status. As business develop from nascent to established business owners the presence of indigenous people increases and of non-indigenous people decreases. One objective of this paper is to test using multivariate models, which control for different variables, if this relationship holds.

Graph 2




*Graph 3* shows demographic information by ethnicity. Of the total indigenous people in the sample around nine percent are nascent, new, and established entrepreneurs – the rest, around 73 percent, are not entrepreneurs. Regarding the no-indigenous people in the sample, around 14, eight, and seven percent are nascent, new, and established entrepreneurs respectively – the rest, around 72 percent are not entrepreneurs. Note that indigenous people are equality likely to be nascent, new, or established entrepreneurs. No-indigenous people are more likely to be nascent entrepreneurs and less likely to be new or established entrepreneurs.

Graph 3




## Design/methodology/approach

I use correlation techniques as well as probit models to evaluate the effect of different socio-demographic and perceptual variables over entrepreneurial status.

The perceptual variables are four:

(1) Know: that has the value of one if the person knows somebody who has started a business in the past two years, and zero otherwise.

(2) Op: that has the value of one of the person believes that there will be good business opportunities in the next six months in the zone she lives, and zero otherwise.

(3) Skill: that has the value of one if the person thinks that she has the knowledge, skills, and experience needed to start a new business, and zero otherwise.

(4) Fear: that has the value of one if the person sees fear to failure as an obstacle to start a business, and zero otherwise.

*Table 1* has a list of variables used.

Table 1: Variable definition, GEM 2014 Guatemala data.

| Variable | Value |
|---|---|
| Ethnicity | Indigenous |
| | Non-indigenous |
| Gender | Female |
| | Male |
| Type of business (for nascent and new business owners) | Extractive |
| | Transforming |

| | |
|---|---|
| | Business service |
| | Consumer oriented |
| Type of business (for established business owners) | Extractive |
| | Transforming |
| | Business service |
| | Consumer oriented |
| Entrepreneurial status | No-entrepreneur |
| | Nascent entrepreneur |
| | New business owner |
| | Established business owner |
| Age | Age 18-24 |
| | Age 25-34 |
| | Age 35-44 |
| | Age 45-54 |
| | Age 55-64 |
| Education | Without education |
| | Incomplete primary |
| | Complete primary |
| | Incomplete middle-school |
| | Complete middle-school |
| | Incomplete high-school |
| | Complete high-school |
| | Incomplete University |
| | Complete University |
| Working status | Full time |
| | Part time |
| | Unemployed and other |
| Household income | Lowest 33%tile |
| | Middle 33%tile |
| | Highest 33%tile |
| Perceptual variables | Know |
| | Op |
| | Skill |
| | Fear |
| Marital status | Married |

*Models*

Three different sets of probit models are used in the analysis. The first set of models (models 1, 3 and 5) is:

$$y_i^* = \beta x_i + u_i, u_i \sim N(0, \sigma^2)$$

Where $y_i$ takes the value of "1" if the individual is a nascent entrepreneur (model 1), a new business owner (model 3), or an established entrepreneur (model 5), and "0" otherwise. For each model other categories of entrepreneurial activity are excluded. For example in model 1 new business owners and established business owners are excluded.

$x_i$ is a vector of variables which includes control variables, including the variable indigenous. All of the control variables are discontinuous. Models 2, 4, and 6 add perceptual variables.

The second set (models 7, 8, 9, and 10) is:

$$y_i^* = \beta x_i + u_i, u_i \sim N(0, \sigma^2)$$

Where $y_i$ takes the value of "1" if the individual is a nascent entrepreneur *and* male (model 7), nascent entrepreneur *and* female (model 8), nascent entrepreneur *and* indigenous (model 9), and nascent entrepreneur *and* non-indigenous (model 10). $x_i$ is a vector of independent variables.

The third set (models 11, 12, 13, and 14) is:

$$y_i^* = \beta x_i + u_i, u_i \sim N(0, \sigma^2)$$

Where $y_i$ takes the value of "1" if the individual perceptual (skill, know, op, fear) variable takes the value of "yes", and "0" for "no". $x_i$ is a vector of independent variables.

**Descriptive results**

1) **Consumer oriented activities rule**. 11.9 percent, 8.3 percent, and 7.5 percent in the GEM sample are nascent entrepreneurs, baby business owners, and established business respectively (see *graph 1* and *table 1*). Nascent entrepreneurs are focused on consumer-oriented type of business (*table 2*), following by transforming activities, business services, and finally, extractive activities. Women, indigenous and non-indigenous, dedicate largely to consumer-oriented activities. Men, indigenous and non-indigenous, also dedicate largely to consumer-oriented activities and dedicate more to transforming activities than women do. Non-indigenous men have the largest, but still small, representation in extractive activates. A similar allocation can be seen for baby business owners and for established business owners (see *table 3* and *4*).

Table 2: Nascent entrepreneur

| | **Extractive** | **Transforming** | **Business services** | **Consumer oriented** | **Other** |
|---|---|---|---|---|---|
| Indigenous | 1 | 17 | 2 | 47 | 1 |
| (N= 68-classified) | 1.50% | 25.00% | 2.90% | 69.10% | 1.50% |
| Non-indigenous | 4 | 30 | 12 | 129 | 1 |
| (N= 176-classified) | 2.30% | 17.00% | 6.80% | 73.30% | 0.6% |
| Other | 0 | 1 | 0 | 13 | 0 |
| (N= 14-classified) | 0.00% | 7.10% | 0.00% | 92.60% | 0.00% |
| Sample average | 5 | 48 | 14 | 189 | 2 |
| (N= 258-classified) | 1.94% | 18.60% | 5.43% | 73.26% | 0.78% |
| X-squared = 0.248, df = 8, p-value = 1 (Independent). | | | | | |
| | **Extractive** | **Transforming** | **Business services** | **Consumer oriented** | **Other** |
| Male | 4 | 38 | 10 | 88 | 1 |

| | | | | | |
|---|---|---|---|---|---|
| (N= 141-classified) | 2.80% | 27.00% | 7.10% | 62.40% | 0.07% |
| Female | 1 | 10 | 4 | 101 | 1 |
| (N= 117-classified) | 0.90% | 8.50% | 3.40% | 86.30% | 0.09% |
| Sample average | 5 | 48 | 14 | 189 | 2 |
| (N= 258-classified) | 1.94% | 18.60% | 5.43% | 73.26% | 0.78% |

X-squared = 15.7867, df = 4, p-value = 0.003319 (Dependent).

| | **Extractive** | **Transforming** | **Business services** | **Consumer oriented** | **Other** |
|---|---|---|---|---|---|
| Indigenous male | 1 | 11 | 1 | 22 | 1 |
| (N= 36-classified) | 2.80% | 30.60% | 2.80% | 61.10% | 0.00% |
| Indigenous female | 0 | 6 | 1 | 25 | 0 |
| (N= 32-classified) | 0% | 18.80% | 3.10% | 78.10% | 2.80% |
| Non-indigenous male | 3 | 26 | 9 | 62 | 0 |
| (N= 100-classified) | 3% | 26% | 9% | 62% | 0.00% |
| Non-indigenous female | 1 | 4 | 3 | 67 | 1 |
| (N= 76-classified) | 1.30% | 5.30% | 3.90% | 88.20% | 1.30% |
| Other | 0 | 1 | 0 | 13 | 0 |
| N= 14-classified | 0.00% | 7.10% | 0.00% | 92.90% | 0.00% |
| Sample average | 5 | 48 | 14 | 189 | 2 |
| (N= 256-classified) | 1.95% | 18.75% | 5.47% | 73.83% | 0.78% |

X-squared = 64.7046, df = 16, p-value = 8.281e-08 (Dependent).

Table 3: New business owner

| | **Extractive** | **Transforming** | **Business services** | **Consumer oriented** | **Other** |
|---|---|---|---|---|---|
| Indigenous | 2 | 16 | 1 | 43 | 0 |
| (N= 62-classified) | 3.20% | 25.80% | 1.60% | 69.40% | 0.00% |
| Non-indigenous | 1 | 24 | 12 | 69 | 2 |
| (N= 108-classified) | 0.90% | 22.20% | 11.10% | 63.90% | 1.90% |
| Other | 0 | 2 | 4 | 4 | 0 |
| (N= 10-classified) | 0.00% | 20.00% | 40.00% | 40.00% | 0.00% |
| Sample average | 3 | 42 | 17 | 116 | 2 |
| (N= 180-classified) | 1.67% | 23.33% | 9.44% | 64.44% | 1.11% |

X-squared = 62.5413, df = 8, p-value = 1.475e-10 (Dependent)

| | **Extractive** | **Transforming** | **Business services** | **Consumer oriented** | **Other** |
|---|---|---|---|---|---|
| Male | 3 | 32 | 12 | 55 | 2 |

| | | | | | |
|---|---|---|---|---|---|
| (N= 104-classified) | 2.90% | 30.80% | 11.50% | 52.90% | 1.90% |
| Female | 0 | 10 | 5 | 61 | 0 |
| (N= 76-classified) | 0.00% | 13.20% | 6.60% | 80.30% | 0.00% |
| Sample average | 3 | 42 | 17 | 116 | 2 |
| (N= 180-classified) | 1.67% | 23.33% | 9.44% | 64.44% | 1.11% |

X-squared = 18.8028, df = 4, p-value = 0.0008592 (Dependent)

| | **Extractive** | **Transforming** | **Business services** | **Consumer oriented** | **Other** |
|---|---|---|---|---|---|
| Indigenous male | 2 | 10 | 0 | 21 | 0 |
| (N= 33-classified) | 6.10% | 30.30% | 0.00% | 63.60% | 0.00% |
| Indigenous female | 0 | 6 | 1 | 22 | 0 |
| (N= 29-classified) | 0.00% | 20.70% | 3.40% | 75.90% | 0.00% |
| Non-indigenous male | 1 | 20 | 8 | 34 | 2 |
| (N= 65-classified) | 1.50% | 30.80% | 12.30% | 52.30% | 3.10% |
| Non-indigenous female | 0 | 4 | 4 | 35 | 0 |
| (N= 43-classified) | 0.00% | 9.30% | 9.30% | 81.40% | 0.00% |
| Other | 0 | 2 | 4 | 4 | 0 |
| (N= 10-classified) | 0.00% | 20.00% | 40.00% | 40.00% | 0.00% |
| Sample average | 3 | 42 | 17 | 116 | 2 |
| (N= 180-classified) | 1.67% | 23.33% | 9.44% | 64.44% | 1.11% |

X-squared = 140.4366, df = 16, p-value < 2.2e-16 (Dependent).

Table 4: Established business owner

| | **Extractive** | **Transforming** | **Business services** | **Consumer oriented** |
|---|---|---|---|---|
| Indigenous | 1 | 20 | 1 | 43 |
| (N= 65-classified) | 1.50% | 30.80% | 1.50% | 66.20% |
| Non-indigenous | 3 | 23 | 3 | 57 |
| (N= 86-classified) | 3.50% | 26.70% | 3.50% | 66.30% |
| Other | 0 | 2 | 0 | 8 |
| (N= 10-classified) | 0.00% | 20.00% | 0.00% | 80.00% |
| Sample average | 4 | 45 | 4 | 108 |
| (N= 161-classified) | 2.48% | 27.95% | 2.48% | 67.08% |

X-squared = 11.4806, df = 6, p-value = 0.07461 (Independent).

| | **Extractive** | **Transforming** | **Business services** | **Consumer oriented** |
|---|---|---|---|---|
| Male | 4 | 33 | 3 | 54 |

| | | | | |
|---|---|---|---|---|
| (N= 94-classified) | 4.30% | 35.10% | 3.20% | 57.40% |
| Female | 0 | 12 | 1 | 54 |
| (N= 67-classified) | 0.00% | 17.90% | 1.50% | 80.60% |
| Sample average | 4 | 45 | 4 | 108 |
| (N= 161-classified) | 2.48% | 27.95% | 2.48% | 67.08% |

X-squared = 14.3971, df = 3, p-value = 0.002412 (Dependent).

| | **Extractive** | **Transforming** | **Business services** | **Consumer oriented** |
|---|---|---|---|---|
| Indigenous male | 1 | 16 | 1 | 23 |
| (N= 41-classified) | 2.40% | 39.00% | 2.40% | 56.10% |
| Indigenous female | 0 | 4 | 0 | 20 |
| (N= 24-classified) | 0.00% | 16.70% | 0.00% | 83.30% |
| Non-indigenous male | 3 | 15 | 2 | 27 |
| (N= 47-classified) | 6.40% | 31.90% | 4.30% | 57.40% |
| Non-indigenous female | 0 | 8 | 1 | 30 |
| (N= 39-classified) | 0.00% | 20.50% | 2.60% | 76.90% |
| Other | 0 | 2 | 0 | 8 |
| (N= 10-classified) | 0.00% | 20.00% | 0.00% | 80.00% |
| Sample average | 4 | 45 | 4 | 108 |
| (N= 161-classified) | 2.48% | 27.95% | 2.48% | 67.08% |

X-squared = 48.5309, df = 12, p-value = 2.526e-06 (Dependent).

1) **Indigenous people are less likely to be nascent entrepreneur but more likely to be established business owners**. Being indigenous is negatively correlated with being a nascent business owner but positively correlated with being an established business owner. Being an indigenous man is positively correlated with being an established business, and being an indigenous woman is negatively correlated with being a nascent entrepreneur. This suggests that the overall relation between being indigenous and the type of business is driven by gender differences. Being non-indigenous is positively correlated with being a nascent business owner. Being a man is positively correlated with the three different types of businesses; being a woman, on the other hand, is negatively correlated. Being a non-indigenous man is positively correlated with being a nascent entrepreneur and with being a new business owner. Finally, being a non-indigenous woman is negatively correlated with being a new business owner and an established business. All this differences are statistically significant (*table 5*).

Table 5: Pearson correlations between ethnicity/gender and entrepreneurial activity in Guatemala 2014, individuals 18-64 yrs old

| | **Nascent entrepreneurs** | **New business owners** | **Established business owners** |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Indigenous (N=716) | -0.0530081 | 0.008108179 | 0.04338051 |
| p-value | 0.01312 | 0.7066 | 0.04391 |
| Unweighted freq. | 3% | 3% | 3% |
| Non-indigenous (N=1300) | 0.06005639** | -0.00148529 | -0.03959596* |
| p-value | 0.005258 | 0.945 | 0.06591 |
| Unweighted freq. | 8% | 5% | 4% |
| Other (no ethnic classification) (N=142) | -0.01714863 | -0.01246649 | -0.00422568 |
| p-value | 0.4259 | 0.5627 | 0.8445 |
| Unweighted freq. | 1% | 0% | 0% |
| Male (N=1004) | 0.06003766** | 0.06805837** | 0.06751648** |
| p-value | 0.005272 | 0.001559 | 0.0017 |
| Unweighted freq. | 7% | 5% | 4% |
| Female (N=1152) | -0.05934539** | -0.06748924** | -0.06698035** |
| p-value | 0.005821 | 0.001707 | 0.001851 |
| Unweighted freq. | 5% | 4% | 3% |
| Indigenous male (N=351) | -0.02308125 | 0.01690635 | 0.07078924** |
| p-value | 0.2838 | 0.4325 | 0.0009994 |
| Unweighted freq. | 2% | 2% | 2% |
| Indigenous female (N=365) | -0.04433969 | -0.00645937 | -0.01520131 |
| p-value | 0.03944 | 0.7643 | 0.4803 |
| Unweighted freq. | 1% | 1% | 1% |
| Non-indigenous male (N=591) | 0.09398093** | 0.05901928** | 0.01149962 |
| p-value | 1.226e-05 | 0.006097 | 0.5934 |
| Unweighted freq. | 5% | 3% | 2% |
| Non-indigenous female (N=709) | -0.02665259 | -0.05758334** | -0.05217636 |
| p-value | 0.2159 | 0.007458 | 0.01535 |
| Unweighted freq. | 4% | 2% | 2% |
| Sample average (N=2158) | 12% | 8% | 7% |

Note. Unweighted observed frequencies in %, N=2,158 valid observations. Shade denotes significance at >=95%, ** denotes significance at >99%, * denotes significance at >=90%.

2) **Indigenous people are younger**. In the GEM sample being indigenous is generally associated with being younger than being non-indigenous (see *table 6*).

Table 6: Pearson correlations between ethnicity/gender and age in

Guatemala 2014, individuals 18-64 yrs old

| | **Age 18-24** | **Age 25-34** | **Age 35-44** | **Age 45-54** | **Age 55-64** |
|---|---|---|---|---|---|
| Indigenous (N= 716) | 0.026 | 0.036* | 0.017 | -0.032 | -0.080*** |
| p-value | 0.221 | 0.091 | 0.425 | 0.138 | 0.000 |
| Unweighted freq. | 10% | 11% | 7% | 4% | 2% |
| Non-indigenous (N= 1300) | -0.024 | -0.033 | -0.018 | 0.029 | 0.084*** |
| p-value | 0.259 | 0.126 | 0.414 | 0.177 | 0.000 |
| Unweighted freq. | 16% | 18% | 12% | 8% | 7% |
| Other (no ethnic classification) (N=142) | -0.002 | -0.004 | 0.002 | 0.003 | -0.014 |
| p-value | 0.923 | 0.845 | 0.924 | 0.882 | 0.506 |
| Unweighted freq. | 2% | 2% | 1% | 1% | 1% |
| Male (N= 1004) | 0.012 | 0.016 | -0.018 | -0.012 | 0.002 |
| p-value | 0.572 | 0.468 | 0.394 | 0.584 | 0.943 |
| Unweighted freq. | 13% | 14% | 9% | 6% | 4% |
| Female (N= 1152) | -0.011 | -0.014 | 0.019 | 0.013 | -0.001 |
| p-value | 0.608 | 0.504 | 0.371 | 0.561 | 0.965 |
| Unweighted freq. | 14% | 16% | 11% | 7% | 5% |
| Indigenous male (N=351) | -0.029 | 0.048 | 0.001 | -0.017 | -0.012 |
| p-value | 0.183 | 0.025 | 0.953 | 0.431 | 0.589 |
| Unweighted freq. | 4% | 6% | 3% | 2% | 1% |
| Indigenous female (N=365) | 0.061 | -0.002 | 0.020 | -0.023 | -0.089*** |
| p-value | 0.004 | 0.939 | 0.345 | 0.277 | 0.000 |
| Unweighted freq. | 6% | 5% | 4% | 2% | 1% |
| Non-indigenous male (N=591) | 0.035 | -0.018 | -0.023 | -0.005 | 0.018 |
| p-value | 0.108 | 0.395 | 0.286 | 0.809 | 0.411 |
| Unweighted freq. | 8% | 8% | 5% | 3% | 3% |
| Non-indigenous female (N=709) | -0.058*** | -0.017 | 0.003 | 0.035 | 0.071*** |
| p-value | 0.007 | 0.433 | 0.872 | 0.102 | 0.001 |
| Unweighted freq. | 8% | 10% | 7% | 5% | 4% |
| Sample average (N=2154) | 27% | 30% | 20% | 13% | 9% |

Note. Unweighted observed frequencies in %, N=2,154 valid observations, ** denotes significance at >99%, * denotes significance at >=90%.

3) **Non-indigenous and men have higher levels of education**. In the GEM sample 28 percent, the largest group, has completed highs school (see *table 7*). Generally speaking being non-indigenous and man is positively related with higher levels of education. Being indigenous and women is positively associated with lower levels of education. Indigenous women have the lowest level of education (see *table 7*).

Table 7: Pearson correlations between ethnicity/gender and educational attainment in Guatemala 2014, individuals 18-64 yrs old

| | Without education | Incomplete primary | Complete primary | Incomplete middle school | Complete middle school | Incomplete high school | Complete high school | Incomplete University | Complete University |
|---|---|---|---|---|---|---|---|---|---|
| Indigenous (N= 716) | 0.092*** | 0.103*** | 0.051 | -0.015 | -0.008 | -0.005 | -0.061*** | -0.084*** | -0.068*** |
| p-value | 0.000 | 0.000 | 0.019 | 0.474 | 0.708 | 0.830 | 0.004 | 0.000 | 0.002 |
| Unweighted freq. | 3% | 6% | 7% | 2% | 4% | 2% | 8% | 2% | 1% |
| Non-indigenous (N= 1300) | -0.092*** | -0.120*** | -0.089*** | 0.014 | 0.009 | 0.007 | 0.086*** | 0.106*** | 0.084*** |
| p-value | 0.000 | 0.000 | 0.000 | 0.505 | 0.680 | 0.731 | 0.000 | 0.000 | 0.000 |
| Unweighted freq. | 2% | 6% | 9% | 4% | 7% | 4% | 18% | 7% | 3% |
| Other (no ethnic classification) (N=142) | 0.005 | 0.042 | 0.080*** | 0.001 | -0.002 | -0.006 | -0.055 | -0.049 | -0.037* |
| p-value | 0.805 | 0.050 | 0.000 | 0.967 | 0.917 | 0.786 | 0.011 | 0.023 | 0.089 |
| Unweighted freq. | 0% | 1% | 2% | 0% | 1% | 0% | 1% | 0% | 0% |
| Male (N= 1004) | -0.07*** | -0.111*** | 0.007 | 0.051 | -0.002 | 0.062*** | 0.009 | 0.053 | 0.024 |
| p-value | 0.001 | 0.000 | 0.760 | 0.019 | 0.909 | 0.004 | 0.691 | 0.014 | 0.269 |
| Unweighted freq. | 2% | 4% | 8% | 4% | 5% | 4% | 13% | 5% | 2% |
| Female (N= 1152) | 0.072*** | 0.111*** | -0.006 | -0.050 | 0.003 | -0.062*** | -0.007 | -0.052 | -0.023 |
| p-value | 0.001 | 0.000 | 0.790 | 0.020 | 0.884 | 0.004 | 0.731 | 0.016 | 0.276 |
| Unweighted freq. | 4% | 8% | 9% | 3% | 6% | 3% | 15% | 4% | 2% |
| Indigenous male (N=351) | 0.033 | -0.013 | 0.046 | 0.011 | 0.018 | 0.018 | -0.030 | -0.042 | -0.029 |
| p-value | 0.129 | 0.551 | 0.032 | 0.623 | 0.412 | 0.414 | 0.172 | 0.049 | 0.176 |
| Unweighted freq. | 1% | 2% | 3% | 1% | 2% | 1% | 4% | 1% | 0% |
| Indigenous female (N=365) | 0.084*** | 0.142*** | 0.018 | -0.050 | -0.028 | -0.023 | -0.048 | -0.064*** | -0.057*** |
| p-value | 0.000 | 0.000 | 0.405 | 0.020 | 0.201 | 0.283 | 0.026 | 0.003 | 0.008 |
| Unweighted freq. | 2% | 4% | 3% | 1% | 2% | 1% | 4% | 1% | 0% |
| Non-indigenous male (N=591) | -0.102*** | -0.127*** | -0.052 | 0.043 | -0.010 | 0.054 | 0.048 | 0.101*** | 0.059*** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| p-value | 0.000 | 0.000 | 0.016 | 0.046 | 0.630 | 0.012 | 0.026 | 0.000 | 0.006 |
| Unweighted freq. | 0.004182156 | 2% | 4% | 2% | 3% | 2% | 9% | 4% | 2% |
| Non-indigenous female (N=709) | 0.001 | -0.005 | -0.044 | -0.026 | 0.019 | -0.044 | 0.045 | 0.014 | 0.032 |
| p-value | 0.967 | 0.811 | 0.042 | 0.229 | 0.375 | 0.042 | 0.038 | 0.502 | 0.141 |
| Unweighted freq. | 2% | 4% | 5% | 2% | 4% | 2% | 10% | 3% | 2% |
| Sample average (N=2152) | 112 | 267 | 364 | 135 | 249 | 133 | 593 | 209 | 90 |
| % | 5% | 12% | 17% | 6% | 12% | 6% | 28% | 10% | 4% |

Note. Unweighted observed frequencies in %, N=2,152 valid observations. Blue shade denotes significance at >=95%, ** denotes significance at >99%, * denotes significance at >=90%.

4) **Indigenous and non-indigenous men are more likely to have a full time job**. Men are more likely to have a full time job, and less likely to be unemployed or in other categories of employment (see *table 8*). Women, on the other hand, are less likely to have a full time job. Indigenous men are more likely to have a full time job and indigenous women are less likely to have a full time job. Non-indigenous men are more likely to have a full time job and less likely to be unemployed. Non-indigenous women are less likely to have a full time job. All this correlations are statistically significant.

Table 8: Pearson correlations between ethnicity/gender and working status in Guatemala 2014, individuals 18-64 yrs old

| | **Full time** | **Part time** | **Unemployed and other** |
|---|---|---|---|
| Indigenous (N= 716) | -0.003 | 0.034 | -0.025 |
| p-value | 0.875 | 0.114 | 0.249 |
| Unweighted freq. | 13% | 8% | 13% |
| Non-indigenous (N=1300) | 0.004 | -0.016 | 0.009 |
| p-value | 0.862 | 0.469 | 0.671 |
| Unweighted freq. | 24% | 12% | 24% |
| Other (no ethnic classification) (N=142) | -0.001 | -0.034 | 0.029 |
| p-value | 0.963 | 0.115 | 0.177 |
| Unweighted freq. | 3% | 1% | 3% |
| Men (N= 1004) | 0.348*** | -0.029 | -0.324*** |
| p-value | 0.000 | 0.183 | 0.000 |
| Unweighted freq. | 27% | 9% | 11% |
| Women (N= 1152) | -0.346*** | 0.030 | 0.322*** |

| | | | |
|---|---|---|---|
| p-value | 0.000 | 0.169 | 0.000 |
| Unweighted freq. | 13% | 12% | 29% |
| Indigenous men (N= 351) | 0.164*** | 0.001 | -0.165*** |
| p-value | 0.000 | 0.947 | 0.000 |
| Unweighted freq. | 9% | 3% | 3% |
| Indigenous women (N=365) | -0.166*** | 0.041* | 0.131*** |
| p-value | 0.000 | 0.054 | 0.000 |
| Unweighted freq. | 0.037 | 0.041 | 0.091 |
| Non-indigenous men (N=591) | 0.225*** | -0.023 | -0.205*** |
| p-value | 0.000 | 0.276 | 0.000 |
| Unweighted freq. | 16% | 5% | 6% |
| Non-indigenous women (N=591) | -0.210*** | 0.006 | -0.205*** |
| p-value | 0.000 | 0.780 | 0.000 |
| Unweighted freq. | 8% | 7% | 18% |
| Sample average (N=2158) | 855 | 446 | 857 |
| % | 40% | 21% | -2% |

Note. Unweighted observed frequencies in %, N=2,158 valid observations. Blue shade denotes significance at >=95%, ** denotes significance at >99%, * denotes significance at >=90%.

5) **Indigenous people have lower income**. In the sample 49 percent of the interviewees are located in the lowest 33 percentile, 48 in the middle 33 percentile, and 3 percent in the highest 33 percentile. Indigenous people are more likely to be in the lowest 33 percentile of income, and less likely to be in middle or higher 33 percentile. The opposite is true for non-indigenous people. Men are less likely to be in the lowest 33 percentile and more likely to be in the upper 33 percentile. The opposite is true for women. Indigenous men are more likely to be in the lowest 33 percentile, and less likely to be in the middle or higher 33 percentile of income; the same applies to indigenous women but at a higher level of correlation. Non-indigenous men are less likely to be in the lower 33 percentile, and more likely to be in the middle 33 percentile and higher 33 percentile. All of these correlations are statistically significant (see *table 9*).

Table 9: Pearson correlations between ethnicity/gender and household income in Guatemala 2014, individuals 18-64 yrs old

| | **Lowest 33%tile** | **Middle 33%tile** | **Upper 33%tile** |
|---|---|---|---|
| Indigenous (N= 716) | 0.183*** | -0.087*** | -0.130*** |

| | | | |
|---|---|---|---|
| p-value | 0.000 | 0.000 | 0.000 |
| Unweighted freq. | 21% | 9% | 4% |
| Non-indigenous (N= 1300) | -0.183 | 0.075*** | 0.149*** |
| p-value | 0.000 | 0.000 | 0.000 |
| Unweighted freq. | 25% | 22% | 14% |
| Other (no ethnic classification) (N=142) | 0.013 | 0.017 | -0.047 |
| p-value | 0.534 | 0.429 | 0.028 |
| Unweighted freq. | 3% | 2% | 1% |
| Men (N= 1004) | -0.067*** | 0.031 | 0.051 |
| p-value | 0.002 | 0.150 | 0.018 |
| Unweighted freq. | 21% | 16% | 9% |
| Women (N= 1152) | 0.068*** | -0.030 | -0.050 |
| p-value | 0.001 | 0.168 | 0.020 |
| Unweighted freq. | 0.278 | 0.169 | 0.087 |
| Indigenous men (N= 351) | 0.089*** | -0.036* | -0.070*** |
| p-value | 0.000 | 0.094 | 0.001 |
| Unweighted freq. | 10% | 5% | 2% |
| Indigenous women (N= 365) | 0.142*** | -0.074*** | -0.094*** |
| p-value | 0.000 | 0.001 | 0.000 |
| Unweighted freq. | 11% | 4% | 2% |
| Non-indigenous men (N= 591) | -0.158*** | 0.061*** | 0.132*** |
| p-value | 0.000 | 0.005 | 0.000 |
| Unweighted freq. | 10% | 10% | 7% |
| Non-indigenous women (N= 709) | -0.041*** | 0.020 | 0.030 |
| p-value | 0.059 | 0.343 | 0.170 |
| Unweighted freq. | 15% | 11% | 6% |
| Sample average (N=2156) | 1055 | 710 | 391 |
| % | 49% | 48% | 3% |

Note. Unweighted observed frequencies in %, N=2,152 valid observations. Blue shade denotes significance at >=95%, ** denotes significance at >99%, * denotes significance at >=90%.

6) **Indigenous people are less likely to know people who have opened businesses in the past two years**. Indigenous people are less likely to know somebody who has opened a business in the past two years. The opposite is true for non-indigenous people. Being a man is positively related with knowing other entrepreneurs, with holding the perception of seen themselves as having the knowledge, skills, and

expertise to open a business, and negatively correlated with fear to fail. The opposite is true for women, and indigenous women as well. The opposite is true for women. These correlations are statistically significant (*table 10*).

Table 10: Pearson correlations between ethnicity/gender and perceptual variables in Guatemala 2014, individuals 18-64 yrs old

| | **SKILL (yes)** | **KNOW (yes)** | **OP (yes)** | **FEAR (yes)** |
|---|---|---|---|---|
| Indigenous (N= 716) | -0.018 | -0.097*** | 0.021 | 0.039* |
| p-value | 0.399 | 0.000 | 0.336 | 0.074 |
| Unweighted freq. | 21% | 7% | 14% | 13% |
| Non-indigenous (N= 1300) | 0.024 | 0.125*** | -0.024 | -0.018 |
| p-value | 0.269 | 0.000 | 0.262 | 0.406 |
| Unweighted freq. | 39% | 19% | 25% | 22% |
| Other (no ethnic classification) (N=142) | -0.012 | -0.062*** | 0.008 | -0.038* |
| p-value | 0.562 | 0.004 | 0.701 | 0.079 |
| Unweighted freq. | 4% | 1% | 3% | 2% |
| Male (N= 1004) | 0.120*** | 0.128*** | 0.053 | -0.081*** |
| p-value | 0.000 | 0.000 | 0.014 | 0.000 |
| Unweighted freq. | 32% | 15% | 21% | 15% |
| Female (N= 1152) | -0.121*** | -0.131*** | -0.053 | 0.080*** |
| p-value | 0.000 | 0.000 | 0.014 | 0.000 |
| Unweighted freq. | 31% | 11% | 21% | 22% |
| Indigenous male (N= 351) | 0.050 | 0.010 | 0.061*** | -0.019 |
| p-value | 0.021 | 0.631 | 0.004 | 0.369 |
| Unweighted freq. | 11% | 4% | 8% | 6% |
| Indigenous female (N= 365) | -0.072*** | -0.132*** | -0.034 | 0.067*** |
| p-value | 0.001 | 0.000 | 0.110 | 0.002 |
| Unweighted freq. | 9% | 2% | 6% | 8% |
| Non-indigenous male (N= 591) | 0.092*** | 0.143*** | 0.006 | -0.070*** |
| p-value | 0.000 | 0.000 | 0.765 | 0.001 |
| Unweighted freq. | 19% | 10% | 12% | 9% |
| Non-indigenous female (N= 709) | -0.062*** | -0.006 | -0.031 | 0.048 |

| | | | | |
|---|---|---|---|---|
| p-value | 0.004 | 0.789 | 0.147 | 0.026 |
| Unweighted freq. | 19% | 9% | 13% | 13% |
| Sample average (N= 3656) | 1371 | 574 | 909 | 802 |
| % | 38% | 16% | 25% | 22% |

Note. Unweighted observed frequencies in %, N=2,152 valid observations. Blue shade denotes siginficance at >=95%, *** denotes significance at >99%, * denotes significance at >=90%.

**Results of probit models**

7) **Older, indigenous, men, and married people are more likely to be established business owners – females are less likely**. *Table 11* presents the results of three probit models to examine the probability to become a nascent entrepreneur (model 1 and 2), a new business owner (model 3 and 4), and an established entrepreneur (model 5 and 6). Models 1, 3, and 5, include different socio-economic variables, and models 2, 4, and 6 add perceptual variables, and these models present a better fit, as indicated by a higher pseudo r-squared. Being a nascent entrepreneur (model 2) is positively correlated with being relatively young (from 25 to 44 years of age) relative to the oldest reference group in the sample. It is also positively correlated with having a full time or a part time job. Being a nascent entrepreneur is also positively correlated with being in the middle 33 percentile of income, compared to the highest 33 percentile, and negatively correlated with being in the 33 lowest percentile. It is also positively correlated with being married, and with four perceptual variables, knowledge of other entrepreneurs, with the perception of the existence of business opportunities in the area, with the perception of having the knowledge, skills and expertise to start a business, and negatively correlated with fear to fail. All of these variables are highly statistically significant. Being indigenous is negatively correlated with being a nascent entrepreneur, but this variable is not statistically significant. Bing a baby business owner (model 4) is positively correlated with having a part time job and with being married, and negatively correlated with being female. It is also positively correlated with knowing people who have started businesses, and with the perception of having the knowledge, skills, and expertise to start a business. It is negatively correlated with the perception of fear to failure as an obstacle to start a business. Being an established business owner (model 6) is negatively correlated with being relatively young (age group 18 to 34 years of age, compared to the oldest group of reference. Being female, indigenous, and married are negatively, positively, and positively correlated respectively with being an established business owner. Knowing somebody who has open a business, having the perception of the existence of business opportunities, and perceiving that one has the knowledge, kills, and expertise to start a business are positively correlated with being an established business owner.

Table 11: Probit estimates for entrepreneurial activity in Guatemala – 2014

| | **Dependent variable** | | | | | |
|---|---|---|---|---|---|---|
| **Independent variables** | Nascent = 1 | | New = 1 | | Established = 1 | |
| | Model 1 (#) | Model 2 (#) | Model 3 (#) | Model 4 (#) | Model 5 (#) | Model 6 (#) |
| 18-24 | 0.242 | 0.21 | -0.037 | -0.039 | -0.793*** | -0.856*** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 0.184 | 0.197 | 0.178 | 0.188 | 0.191 | 0.202 |
| 25-34 | 0.507*** | 0.473** | 0.171 | 0.175 | -0.360** | -0.391** |
| | 0.175 | 0.187 | 0.166 | 0.175 | 0.161 | 0.17 |
| 35-44 | 0.456** | 0.390** | 0.107 | 0.042 | -0.048 | -0.144 |
| | 0.179 | 0.192 | 0.171 | 0.181 | 0.157 | 0.167 |
| 45-54 | 0.383** | 0.386* | -0.03 | -0.073 | 0.269* | 0.216 |
| | 0.189 | 0.202 | 0.19 | 0.201 | 0.158 | 0.167 |
| Female | -0.1 | 0.005 | -0.298*** | -0.164* | -0.299*** | -0.223** |
| | 0.083 | 0.088 | 0.084 | 0.089 | 0.09 | 0.096 |
| No-educ | -0.126 | 0.043 | -0.256 | 0.012 | -0.176 | -0.003 |
| | 0.256 | 0.276 | 0.299 | 0.323 | 0.27 | 0.292 |
| Inc Primary | -0.315 | -0.194 | -0.046 | 0.209 | -0.128 | 0.057 |
| | 0.219 | 0.236 | 0.238 | 0.259 | 0.234 | 0.251 |
| Com Primary | -0.007 | 0.169 | 0.056 | 0.296 | -0.065 | 0.099 |
| | 0.196 | 0.211 | 0.226 | 0.245 | 0.225 | 0.241 |
| Inc Middle | -0.007 | 0.117 | 0.218 | 0.365 | -0.059 | 0.01 |
| | 0.229 | 0.245 | 0.255 | 0.274 | 0.276 | 0.294 |
| Com Middle | -0.055 | 0.059 | 0.15 | 0.295 | 0.076 | 0.126 |
| | 0.205 | 0.219 | 0.235 | 0.253 | 0.24 | 0.255 |
| Inc HighS | 0.201 | 0.198 | 0.044 | 0.115 | 0.136 | 0.085 |
| | 0.228 | 0.243 | 0.271 | 0.291 | 0.288 | 0.309 |
| Com HighS | -0.071 | -0.053 | 0.06 | 0.154 | -0.119 | -0.091 |
| | 0.184 | 0.198 | 0.217 | 0.235 | 0.221 | 0.235 |
| Inc Univ | 0.228 | 0.214 | 0.03 | 0.028 | 0.387 | 0.359 |
| | 0.2 | 0.213 | 0.25 | 0.27 | 0.245 | 0.26 |
| Full Time | 0.349*** | 0.353*** | | | | |
| | 0.094 | 0.1 | | | | |
| Part Time | 0.222** | 0.195* | 0.403*** | 0.390*** | 0.098 | 0.123 |
| | 0.107 | 0.116 | 0.094 | 0.1 | 0.11 | 0.116 |
| Lowest 33 | -0.345*** | -0.216* | | | | |
| | 0.107 | 0.114 | | | | |
| Middle 33 | -0.179* | -0.099 | | | | |
| | 0.106 | 0.113 | | | | |
| Indigenous | -0.132 | -0.105 | 0.018 | 0.085 | 0.209** | 0.226** |
| | 0.088 | 0.093 | 0.093 | 0.098 | 0.098 | 0.104 |
| Other | -0.107 | -0.026 | -0.064 | -0.077 | 0.089 | 0.076 |
| | 0.162 | 0.174 | 0.178 | 0.193 | 0.185 | 0.199 |
| Married | 0.145* | 0.168* | 0.132 | 0.156* | 0.224** | 0.262*** |
| | 0.081 | 0.086 | 0.088 | 0.093 | 0.093 | 0.099 |
| Skill | | 0.649*** | | 0.642*** | | 0.736*** |
| | | 0.101 | | 0.108 | | 0.12 |
| Know | | 0.565*** | | 0.521*** | | 0.387*** |
| | | 0.087 | | 0.097 | | 0.106 |
| Opport | | 0.377*** | | 0.058 | | 0.242** |
| | | 0.083 | | 0.092 | | 0.097 |
| Fear | | -0.186** | | -0.264*** | | -0.107 |
| | | 0.088 | | 0.097 | | 0.1 |
| Constant | -1.368*** | -2.336*** | -1.389*** | -2.157*** | -1.156*** | -1.962*** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 0.243 | 0.28 | 0.244 | 0.282 | 0.238 | 0.278 |
| Observations | 1,835 | 1,835 | 1,757 | 1,757 | 1,738 | 1,738 |
| Log Likelihood | -698.687 | -617.097 | -557.737 | -506.731 | -487.783 | -443.026 |
| Akaike Inf. Crit. | 1,439.37 | 1,284.19 | 1,151.47 | 1,057.46 | 1,011.57 | 930.053 |
| Pseudo R-squared | 0.12 | 0.22 | 0.29 | 0.36 | 0.38 | 0.44 |
| Note: | | | | *p<0.1; | **p<0.05; | ***p<0.01 |

Reference categories: age (age 55-64), gender (male), education (complete university), working status (unemployed and other), household income (highest 33%), and ethnicity (no-indigenous).

# is for discrete change of dummy variable from 0 to 1.

Note: All models contrast individuals of the dependent variable category against the group of non-entrepreneurs. Observations that are coded as other types of entrepreneurs than the ones included in the dependent variable category are dropped from the respective regression.

8) **Separated by gender and ethnicity, perceptual variables are the most highly correlated with nascent entrepreneurship.** *Table 12* shows probit models where the dependent variables are the probability that a persons is male, female, indigenous, and non-indigenous *and* a nascent entrepreneur – models 7, 8, 9 and 10. The probability that a person is nascent entrepreneur *and* male is negatively related with having incomplete primary education, positively correlated with being a full time worker. It is positively correlated with know, Op, and Suskill, and negatively correlated with Fear. The probability that a person is nascent entrepreneur *and* female is positively correlated with being relatively young with respect with the group of reference of higher age, being apart time worker and being married, Know, Op, and Skill. The probability that a person is nascent entrepreneur *and* indigenous is positively correlated with having completed primary education, incomplete university, being a part time worker, married, Skill, and Op. The probability that a person is nascent entrepreneur *and* non-indigenous is negatively correlated with having incomplete primary education, being in the lowest 33 percentile of income, and Fear; and positively correlated with having a full time job, Skill, Know, and Op.. All this variables are statistically significant.

Table 12: Probit estimates for nascent entrepreneurial activity among indigenous and non-indigenous Guatemalans by gender – 2014

| | Dependent Variable: Nascent | | | |
|---|---|---|---|---|
| Independent variable | --------- | ---------- | ---------- | ---------- |
| | Male = 1 | Female = 1 | Indigenous = 1 | No-indigenous = 1 |
| | (Model 7) # | (Model 8) # | (Model 9) # | (Model 10) # |
| ---------- | ---------- | ---------- | ---------- | ---------- |
| 18-24 | -0.144 | 0.537* | 0.258 | 0.131 |
| | (0.229) | (0.279) | (0.293) | (0.226) |
| 25-34 | 0.124 | 0.695*** | 0.417 | 0.368* |
| | (0.216) | (0.268) | (0.278) | (0.216) |
| 35-44 | 0.097 | 0.603** | 0.477* | 0.281 |
| | (0.222) | (0.272) | (0.280) | (0.222) |
| 45-54 | -0.127 | 0.762*** | -0.056 | 0.432* |

| | | | | |
|---|---|---|---|---|
| | (0.247) | (0.277) | (0.331) | (0.231) |
| No-educ | -0.467 | 0.426 | 0.751 | -0.353 |
| | (0.378) | (0.332) | (0.507) | (0.313) |
| Inc Primary | -0.814** | 0.247 | 0.623 | -0.526** |
| | (0.332) | (0.292) | (0.463) | (0.260) |
| Com Primary | -0.006 | 0.306 | 0.795* | -0.160 |
| | (0.238) | (0.276) | (0.444) | (0.221) |
| Inc Middle | 0.046 | 0.149 | 0.538 | -0.119 |
| | (0.276) | (0.319) | (0.494) | (0.260) |
| Com Middle | -0.216 | 0.313 | 0.452 | -0.073 |
| | (0.255) | (0.280) | (0.464) | (0.227) |
| Inc HighS | 0.121 | 0.223 | 0.667 | -0.027 |
| | (0.275) | (0.316) | (0.485) | (0.257) |
| Com HighS | -0.137 | 0.073 | 0.685 | -0.313 |
| | (0.220) | (0.261) | (0.431) | (0.205) |
| Inc Univ | 0.310 | -0.093 | 0.784* | -0.027 |
| | (0.233) | (0.291) | (0.445) | (0.221) |
| Full Time | 0.465*** | 0.096 | 0.111 | 0.330*** |
| | (0.115) | (0.114) | (0.149) | (0.111) |
| Part Time | 0.030 | 0.253* | 0.291* | 0.005 |
| | (0.151) | (0.133) | (0.157) | (0.136) |
| Lowest 33 | -0.175 | -0.166 | -0.085 | -0.266** |
| | (0.135) | (0.142) | (0.164) | (0.125) |
| Middle 33 | -0.137 | 0.008 | -0.143 | -0.101 |
| | (0.134) | (0.139) | (0.167) | (0.124) |
| Married | 0.094 | 0.171* | 0.226* | 0.072 |
| | (0.106) | (0.104) | (0.124) | (0.097) |
| Skill | 0.589*** | 0.534*** | 0.321** | 0.673*** |
| | (0.132) | (0.124) | (0.141) | (0.122) |
| Know | 0.590*** | 0.300*** | 0.203 | 0.639*** |
| | (0.103) | (0.108) | (0.129) | (0.095) |
| Opport | 0.260*** | 0.353*** | 0.291** | 0.297*** |
| | (0.101) | (0.102) | (0.120) | (0.093) |
| Fear | -0.304*** | -0.008 | -0.062 | -0.210** |
| | (0.113) | (0.105) | (0.125) | (0.102) |
| Indigenous | -0.033 | -0.127 | | |
| | (0.112) | (0.111) | | |
| Female | | | -0.067 | 0.008 |
| | | | (0.127) | (0.099) |
| Constant | -2.175*** | -3.015*** | -3.265*** | -2.217*** |
| | (0.310) | (0.381) | (0.526) | (0.304) |
| --- | --- | --- | --- | --- |
| Observations | 1,835 | 1,835 | 1,835 | 1,835 |
| Log Likelihood | -397.903 | -390.686 | -265.745 | -473.766 |
| Akaike Inf. Crit. | 841.806 | 827.373 | 577.489 | 993.532 |
| Pseudo R-squared | 0.4963488 | 0.5054834 | 0.6636301 | 0.4003238 |
| ========== | ======= | ====== | ======= | ======= |
| Note: | | *p<0.1; | **p<0.05; | ***p<0.01 |

Reference categories: age 955-640, gender (male), education (complete university), working status (unemployed and other), household income (highest 33%), ethnicity (no-indigenous).
# is for discrete change of dummy variable from 0 to 1.
Note: All models contrast individuals of the dependent variable category against the group of non-entrepreneurs. Observations that are coded as other types of entrepreneurs
than the ones included in the dependent variable category are dropped from the respective regression.

9) **Entrepreneurs in different stages know other people who have started business, believe that there are business opportunities in their local areas, and believe that they have the knowledge, skill, and expertise to start a new business.** *Table 13* shows the variables associated with the probability of knowing somebody that has started a business in the past two years – Know (model 12), the probability of having the perception that one has the knowledge, skills, and expertise to start a business – Skill (model 11), the probability of having the perception that in the following six months there will be business opportunities in the local area – Op (model 13), and the probability of having the perception that fear to fail is one obstacle to start a business – Fear (model 14). Know is negatively correlated with low levels of education and income, with being female, and with being indigenous. It is positively correlated with being an entrepreneur (in its three stages). Skill is negatively correlated with the age group 35-44, with no education, with being female, and with low levels of income. It is positively correlated with the three stages of entrepreneurship. Regarding the variable Op, it is negatively correlated with the lowest 33 percentile of income and positively correlated with being a nascent, new, and established business owner. Finally, Fearfail is positively correlated with being female, having primary education only, incomplete university education (relative to the highest educational attainment that is possible – complete college), and with being married. It is negatively correlated with being a nascent, new, and established business owner.

Table 13: Probit estimates for perceptual variables – 2014

| | Dependent Variable: Perceptual Variables | | | |
|---|---|---|---|---|
| Independent variable | --------- | ---------- | ---------- | ---------- |
| | Skill = 1 | Know = 1 | Op = 1 | Fear = 1 |
| | (Model 11) # | (Model 12) # | (Model 13) # | (Model 14) # |
| ---------- | ---------- | ---------- | ---------- | ---------- |
| 18-24 | 0.013 | 0.052 | 0.037 | -0.198* |
| | (0.119) | (0.131) | (0.116) | (0.116) |
| 25-34 | 0.062 | 0.018 | 0.096 | -0.075 |
| | (0.112) | (0.125) | (0.109) | (0.109) |
| 35-44 | 0.203* | 0.178 | -0.024 | -0.043 |
| | (0.116) | (0.128) | (0.113) | (0.112) |
| 45-54 | 0.154 | -0.123 | 0.023 | -0.053 |
| | (0.124) | (0.139) | (0.120) | (0.119) |
| No-educ | -0.343* | -0.541*** | 0.064 | 0.234 |

| | | | | |
|---|---|---|---|---|
| | (0.192) | (0.208) | (0.184) | (0.187) |
| Inc Primary | -0.246 | -0.612*** | 0.149 | 0.165 |
| | (0.167) | (0.171) | (0.157) | (0.162) |
| Com Primary | -0.099 | -0.588*** | 0.003 | 0.352** |
| | (0.161) | (0.160) | (0.151) | (0.155) |
| Inc Middle | -0.157 | -0.376** | -0.075 | 0.157 |
| | (0.186) | (0.184) | (0.175) | (0.180) |
| Com Middle | -0.075 | -0.236 | -0.085 | 0.174 |
| | (0.168) | (0.163) | (0.157) | (0.162) |
| Inc HighS | 0.228 | -0.203 | 0.105 | 0.033 |
| | (0.193) | (0.185) | (0.178) | (0.186) |
| Com HighS | 0.029 | -0.224 | 0.040 | 0.077 |
| | (0.155) | (0.148) | (0.144) | (0.149) |
| Inc Univ | 0.119 | 0.022 | 0.071 | 0.313* |
| | (0.175) | (0.165) | (0.161) | (0.165) |
| Full Time | 0.081 | -0.063 | -0.032 | -0.048 |
| | (0.072) | (0.077) | (0.069) | (0.070) |
| Part Time | 0.053 | 0.007 | 0.029 | -0.028 |
| | (0.081) | (0.086) | (0.077) | (0.078) |
| Lowest 33 | -0.283*** | -0.375*** | -0.167** | 0.050 |
| | (0.089) | (0.087) | (0.082) | (0.084) |
| Middle 33 | -0.188** | -0.173** | -0.073 | 0.068 |
| | (0.091) | (0.087) | (0.083) | (0.085) |
| Married | 0.007 | -0.036 | -0.074 | 0.106* |
| | (0.062) | (0.066) | (0.060) | (0.060) |
| Indigenous | 0.014 | -0.179*** | 0.079 | 0.094 |
| | (0.064) | (0.069) | (0.061) | (0.062) |
| Nascent | 0.912*** | 0.720*** | 0.599*** | -0.371*** |
| | (0.109) | (0.089) | (0.087) | (0.092) |
| New | 0.915*** | 0.711*** | 0.370*** | -0.410*** |
| | (0.124) | (0.105) | (0.101) | (0.109) |
| Established | 0.899*** | 0.508*** | 0.466*** | -0.210* |
| | (0.137) | (0.114) | (0.108) | (0.111) |
| Female | -0.181*** | -0.270*** | -0.093 | 0.161*** |
| | (0.064) | (0.066) | (0.060) | (0.061) |
| Constant | 0.369** | -0.106 | -0.241 | -0.514*** |
| | (0.181) | (0.180) | (0.170) | (0.174) |
| ---------- | ---------- | ---------- | ---------- | ---------- |
| Observations | 2,158 | 2,158 | 2,158 | 2,158 |
| Log Likelihood | -1,277.871 | -1,108.090 | -1,420.604 | -1,384.281 |
| Akaike Inf. Crit. | 2,601.743 | 2,262.179 | 2,887.207 | 2,814.562 |
| Pseudo R-squared | -0.6174837 | -0.4025799 | -0.798149 | -0.7521728 |
| Note: | | *p<0.1 | ; **p<0.05 | ; ***p<0.01 |

Reference categories: age (55-64), gender (male), education (complete university), working status (unemployed and other), household income (highest 33%), ethnicity (no-indigenous).

# is for discrete change of dummy variable from 0 to 1.

**Conclusions:**

1. Education does not have a strong relationship with being an entrepreneur in the different phases of business development, or at the most the relationship is weak.
2. Perceptual variables do matter to become an entrepreneur and to move to the next stages of business development (new and established business owners).
3. Being indigenous is negatively correlated with being a nascent entrepreneur, although not at the typical levels of statistical significance, but positively correlated with being an established business owner.
4. Women and indigenous women in particular are in worst position when it comes to the different socioeconomic variables explored in this paper.
5. In general fear to fail seems to be negatively correlated with starting a business or in becoming a new business owner, but it is less important to become an established business owner.
6. Young people tend to start business but they are less successful at becoming themselves established business owners.

**References**

Köllinger, P. & Minniti, M. (2006). Not for a lack of trying: American entrepreneurship in black and white. *Small Business Economics*, 27(1): 59-79.