

# Tackling the Global Profitarchy

## Gender and the Choice of Business Sector

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**WORLD BANK GROUP**

Africa Region

Gender Innovation Lab

&

Gender Global Theme

May 2019

## Abstract

Sectoral segregation is often used to explain a large part of a well-documented gender earnings gap in business profits. Women tend to sort into different sectors than men, and the sectors dominated by women tend to be less profitable. This paper investigates the horizontal dimension of sectoral segregation by studying global data on female and male enterprises operating in sectors that are typically dominated by the same and opposite sex. The analysis uses the novel *Future of Business dataset*, which spans 97 countries and was administered to enterprise owners, managers, and employees who use Facebook. The analysis finds that some of the earnings gap can indeed be explained by sector choice: female-owned businesses in male-dominated sectors make significantly higher profits than those in traditionally female sectors. The evidence points to a hierarchy of

earnings, with male-owned businesses in male-dominated sectors earning the most, women in male-dominated sectors and men in female-concentrated sectors in the middle tier, and women in female-concentrated sectors at the bottom. Correlational analysis suggests that women who own businesses in male-dominated sectors are younger, married, and more likely to have inherited the business than women in female-concentrated sectors. They have similar education to women in female-concentrated sectors and present higher self-efficacy but lower entrepreneurial identity and commitment to the sector. Male support networks appear to be key for female-owned firms, with co-ownership with husbands and male role models factoring into the decision to cross over.

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This paper is a product of the Gender Innovation Lab, Africa Region and Gender Global Theme. It is part of a larger effort by the World Bank to provide open access to its research and make a contribution to development policy discussions around the world. Policy Research Working Papers are also posted on the Web at <http://www.worldbank.org/prwp>. The authors may be contacted at [mgoldsten@worldbank.org](mailto:mgoldsten@worldbank.org), [pgonzalezmartine@worldbank.org](mailto:pgonzalezmartine@worldbank.org), and [spapineni@worldbank.org](mailto:spapineni@worldbank.org).

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## *Tackling the Global Profitarchy: Gender and the Choice of Business Sector*

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JEL: J16 L25 L26

Keywords: Gender, Entrepreneurship and Firms.

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<sup>1</sup> This paper is a product of the World Bank Africa Gender Innovation Lab (AFRIGIL). Goldstein (email: [mgoldstein@worldbank.org](mailto:mgoldstein@worldbank.org)); Gonzalez Martinez ([pgonzalezmartine@worldbank.org](mailto:pgonzalezmartine@worldbank.org)) and Papineni (email: [spapineni@worldbank.org](mailto:spapineni@worldbank.org)). This paper uses data from the *Future of Business* survey which is a collaborative effort between Facebook, the World Bank and the Organization of Economic Co-operation and Development (OECD). We thank Laura McGorman and JW Schneider at Facebook, Mariarosa Lunati at OECD, Kathleen Beegle, Caren Grown and Josh Wimpey at the World Bank for comments; and Chandni Raja for superb research assistance. We are grateful to the World Bank Group's Umbrella Facility for Gender Equality (UFGE) for financial support. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the World Bank and its affiliated organizations, or those of the Executive Directors of the World Bank or the governments they represent.

## I. Introduction

Despite substantial gains in the participation of women in entrepreneurial activity globally (Kelley et al. 2016), a well-documented gender earnings gap persists. Women are found, on average, to earn considerably less than men (IWPR, 2018). Sectoral segregation<sup>2</sup> is often cited as a key determinant of this earnings gap. Women tend to start businesses in different industries than men, and the sectors dominated by women typically earn less. This pattern is often referred to as horizontal segregation. For example, in many countries, female-owned businesses are concentrated in retail trade and services sectors (mainly health, education, and social services), which are characterized by lower investments and growth compared to manufacturing, construction and mining sectors (Rosa and Sylla, 2016). The digital revolution may exacerbate the divide with the gender gap in participation being most pronounced in the information and communications technology (ICT) sector (Kelley et al. 2016).

Labor economists who study the earnings gap in wages also document a pattern of vertical segregation, meaning that within the same sector, women also tend to earn lower wages than men. This has been attributed to hours worked as well as employment flexibility (e.g. Rose and Hartmann, 2004; Goldin, 2014), as well as discrimination. “Glass ceilings,” for example, are a form of vertical segregation in which men hold positions in a company with the highest pay and more authority. When looking at firms, gender pay gaps in wages are harder to explain given the scope of data that are currently available. Hence, in this paper, we will focus on horizontal segregation, but will document some evidence of vertical segregation in firm profits as well.

This paper investigates the horizontal dimension of sectoral segregation by studying global data on female and male enterprise owners who operate in industries that are typically dominated by the same and opposite sex. We use a dataset spanning 97 countries that was administered to enterprise owners, managers and employees that use the Pages feature on Facebook for their business. A Facebook Page is a public profile specifically created for businesses and other organizations. Unlike personal profiles, pages do not gain “friends,” but “fans,” which are people who choose to “like” a page. The data were collected as part of the December 2018 wave of the *Future of Business* survey (FoB) which is a collaborative effort between Facebook, the World Bank and the Organisation of Economic Co-operation and Development (OECD). The most recent round of these data was specifically designed to look at potential correlates of sectoral choice and hence allows us the first opportunity to look at sectoral segregation among firms across the world.

In the sections that follow, we label female enterprise owners who enter and operate in male-dominated sectors as “female crossovers” and those who remain in more traditional female sectors the “female non-crossovers.” We begin by testing the hypothesis that female crossovers make higher returns than female non-crossovers. We find that some of the earnings gap can indeed be explained by sector choice. On average, women who operate in male-dominated sectors make 66 percent higher profits than women who

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<sup>2</sup> The terminology “occupational segregation” is perhaps more widely understood to encapsulate gender segregation in the workplace, that describes the pattern that women and men still tend to work in different sectors and jobs. However, since the focus of this paper is on firms operating in different sectors and not on occupations, per se, we refer to the term as “sectoral segregation” to avoid any ambiguity.

remain in traditionally female sectors.<sup>3</sup> These findings are consistent with micro-level data results found by Campos et al. (2015) in Uganda and Alibhai et al. (2015) in Ethiopia who find that firms owned by women in male-dominated sectors, on average, are far more profitable than firms in traditionally female sectors. Next, we compare the female crossovers and non-crossovers earnings with two categories of male enterprise owners: men in male-dominated sectors and men who operate in traditionally female sectors. We document a hierarchy of earnings consistent with the presence of both horizontal and vertical segregation with men in male-dominated sectors on top; women in male-dominated sectors and men in female-concentrated sectors in the middle tier; and women in female-concentrated sectors at the bottom.

These findings are also consistent with cross-country evidence from the developing world. Research relying on World Bank enterprise surveys finds a significant gender gap in sales across countries in Sub-Saharan Africa, Eastern Europe and Central Asia, and Latin America (Bardasi et al. 2011; Islam et al. 2018). In Sub-Saharan Africa, sales of female-owned businesses are 31 percent lower than businesses owned by their male counterparts (Bardasi et al. 2011). The results for Eastern Europe and Central Asia are corroborated by a separate study that found majority female-owned enterprises to have lower sales and lower total factor productivity than those that were majority male-owned (Sabarwal and Terrell, 2008). Results of a gender gap are less conclusive when entrepreneurship is measured in terms of profits, number of employees, or business survival rates as opposed to revenues.

While existing literature examines industry-based differences in profitability for developing countries, this phenomenon has been less well studied for developed countries. Hence, we next examine the profit differentials across male and female firms by country grouping.<sup>4</sup> For developing countries, our previous ranking holds. However, in developed countries we find that while female crossovers do earn more than female non-crossovers, male firms in female- and male-dominated sectors have similar levels of profits and these are higher than female-owned firms in any sector.

Since industries that are traditionally male could provide an opportunity for women to earn higher returns, next we turn to the analysis of factors that could encourage or prevent women from entering these sectors. Specifically, we explore the factors that are associated with crossing over into the higher-return male-dominated sectors. We find that being young, married, having a male role model, and inheriting the business are positively correlated with the probability of being a female crossover. Identifying the characteristics of women who have successfully entered higher-return male-dominated sectors will help us to develop policy interventions that enable women to build businesses that could positively affect growth while reducing gender earning gaps. Indeed, work from the United States has shown that reducing racial and gender occupational segregation accounted for 40 percent of the growth in market GDP per person from 1960 to 2010 (Hsieh et al. 2019).

Within the factors associated with crossing over, we also examine the entrepreneurial propensities of women crossovers by assessing a range of cognitive and socioemotional skills related to entrepreneurship. A large literature in economics and psychology has documented the importance of these skills for

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<sup>3</sup> The mean of monthly profits in our sample is US\$189,139 and the median is US\$872 (the distribution of profits in the sample is skewed to the right).

<sup>4</sup> We follow the country classification assigned by the IMF in the World Economic Outlook (April 2009) which divides the world into two major groups: advanced economies, and emerging and developing economies. Please refer to the introduction to the WEO's Statistical Appendix for details: <https://www.imf.org/external/pubs/ft/weo/2009/01/weodata/groups.htm>

entrepreneurial success (e.g. Khwaja and Klinger, 2007; Rauch and Frese, 2007; de Mel et al. 2008). We find that women in male-dominated sectors appear to have similar educational attainment to women in female-concentrated sectors, however, they have higher levels of self-efficacy, an important socioemotional skill. Career fit confidence has been shown to explain some of the gender gap in persistence in engineering careers (male-dominated) in the United States (Cech et al. 2011). We include two measures of career fit confidence in the survey and find that, on average, women in male-dominated sectors report being less committed to their sector and have lower entrepreneurial identity.

Finally, we analyze characteristics of the firms and the owners/managers across the different categories of industries and find that women in male-dominated sectors work more hours per week and have a lower share of female employees relative to female-owned firms in female-concentrated sectors. Female crossovers are also more likely to have a line of credit or a loan from a financial institution.

The remainder of this paper is organized as follows. Section II describes the *Future of Business* survey, our main data source. Section III describes how we defined which sectors can be considered male-dominated and female-concentrated. Section IV presents the empirical results where we first compare the business performance and challenges of crossover firms to non-crossover firms. We then explore a number of correlates associated with crossing over to male-dominated sectors, including the role of the spouse and the characteristics of the crossover and non-crossover firms. Section V concludes.

## II. Data Description

Facebook, in partnership with the World Bank and the Organisation for Economic Co-Operation and Development (OECD), conducts a bi-annual global survey on small and medium-sized enterprises (SMEs) that use Facebook. This *Future of Business* survey currently includes 97 countries across every geographic region.<sup>5</sup>

The *Future of Business* (FoB) survey instrument was redesigned for the December 2018 wave to contain a set of questions capturing firm performance outcomes, as well as information from the business owner or manager including his/her background, family history, education, skills, socioeconomic characteristics and other variables.<sup>6</sup>

The survey was offered, by Facebook, to administrators<sup>7</sup> of Facebook-designated SME pages in the specified countries through Facebook for a period of two weeks in early to mid-December. The data were collected on the Facebook platform and the final clean and aggregated, anonymized data are now published on the World Bank Open Data portal.<sup>8</sup>

The online survey format – as opposed to the traditional in-person household survey – may be subject to higher rates of attrition or non-completion and therefore the survey had to be especially cautious of long and/or sensitive questions. However, the online format enabled data to be collected simultaneously across a number of countries and allowed us to target a wide range of firms that may have not shown up on traditional sample frames (e.g. lists of registered firms). Moreover, its convenience for the respondents compared to an in-person survey may have led to higher response rates with the survey duration being capped at approximately 20 minutes.

The sample of respondents of the *Future of Business* survey are limited to those business owners/managers<sup>9</sup> with internet access and Facebook accounts with a business page. Therefore, the authors caution that the sample should not be considered representative of all business owners but a select group of global micro, small and medium enterprises. Nonetheless, the unprecedented level of geographic coverage and sample size on these variables offered by the survey allow us a unique chance to examine these questions on a global scale. Since internet bandwidth and Facebook coverage have increased dramatically in recent years, with an approximate 2.3 billion monthly active users on Facebook<sup>10</sup> at the time of writing, there is considerable scope to learn from this survey. The geographic coverage of the survey has also increased with 11 Sub-Saharan African countries included in this current round that were not present in previous rounds.<sup>11</sup>

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<sup>5</sup> Map presented in Appendix A displays the geographic coverage of the December 2018 wave of the *Future of Business* Survey and the table in Appendix B provides information for all the countries included in the analysis plus the percentage of female respondents per each country.

<sup>6</sup> Facebook did not share any platform data that were not collected through this particular survey round. In the analysis for this paper, we use only anonymized survey responses.

<sup>7</sup> Note some categories of businesses were excluded (governments etc.) from the sampling frame.

<sup>8</sup> World Bank Open Data portal: <https://datacatalog.worldbank.org/dataset/future-business-survey-aggregated-data>

<sup>9</sup> While the *Future of Business* survey targets administrators of business pages which could include business owners, managers, and employees; this paper analyzes the responses from owners and managers only.

<sup>10</sup> Total number of individuals on Facebook are estimated to be equal to the number of monthly active users worldwide as of 4th quarter 2018 that were using Facebook Source: <https://www.statista.com/statistics/264810/number-of-monthly-active-facebook-users-worldwide/>

<sup>11</sup> Includes Nigeria, Kenya, Uganda, South Africa, Côte d'Ivoire, Botswana, Benin, Mozambique, Tanzania, Ghana, and Cameroon.

In the December 2018 survey wave, 394,422 respondents who are administrators of Facebook-designated SME pages responded to the survey. Of the respondents, 39 percent were female, and 61 percent were male.

The sample for this paper includes all respondents with complete gender and industry information. Out of the total number of observations 91 percent of the respondents (357,877) responded to the gender question and, within this subset, 35 percent of the respondents (122,543) responded to the industry question. Since this paper is focused on female-owned and male-owned firms, we conduct the analysis only for respondents who name themselves as owners and/or managers in the survey and exclude employees from our analysis.<sup>12</sup> The owners and managers make up 54 percent of this remaining sample (66,908).<sup>13</sup> Within this subsample, we were able to clearly identify whether the firm in question was in a male-dominated sector or not for 84 percent. Therefore, the total sample size which we base the analysis in this paper is comprised of 55,932 observations. This sample will be used to define the male-dominated sectors and female-concentrated sectors as described in the following section.

The size of the sample changes depending on the outcome that is being analyzed (see Table 1). Questions that were asked later in the survey suffered from greater non-response (such as generalized self-efficacy or entrepreneurial identity indices). The household income and profits variables were reported in local currency and translated by the research team into USD using an average of the exchange rate for the survey period.

**Table 1. Sample Size for key outcomes**

Number of employees	31,756
Total Average Monthly Profits	17,351
Generalized self-efficacy index	26,033
Error management Score	28,663
Entrepreneurial identity index	25,359
Career Fit Confidence: More Committed to staying in sector	25,527
Career Fit Confidence: Good relationships in sector	26,431

The number of employees includes all workers who regularly work in the enterprise, including full-time, part-time and family members. The average monthly profits are self-reported and asked directly to the respondent i.e. not calculated from revenues minus expenses. Generalized self-efficacy index refers to one's own belief in their own competences (based on Schwarzer, R., & Jerusalem, M. 1995). Error management score captures behavior and attitudes individuals display when confronted with errors and mistakes (based

<sup>12</sup> The International Finance Corporation (IFC) defines a woman-owned enterprise as either: (a) 51.0 percent ownership/stake held by a woman/ women; or (b) 20.0 percent ownership/stake held by a woman/women AND 1 woman as CEO/COO (President/ Vice-President) as well as 30.0 percent of the board of directors being women where a board exists. The definition of a female-owned/male-owned firm used in this paper is comparable to the one used by the IFC.

<sup>13</sup> For those cases in which firms have multiple owners, they could be mostly men, mostly women or have the same number of women as men. Taking this into account, we identify two main definitions for determining a male-owned and female-owned firm. In the first definition, when the respondent reported they were an owner we assign the firm as male-owned if the respondent reported that most of the owners were men and we assign the firm as female-owned if the respondent reported most of the owners were women, we follow the same assignment for when the respondent's role is the manager. In the second definition, when the respondent reported they were an owner, we assign to the firm the gender of the owner, regardless of whether the owners were mostly men or women, and when the respondent was the manager, we assign the firm as male-owned when the respondent reported that most of the owners were male and we assign the firm as female-owned when the manager reported most of the owners were female. Results were robust to these two definitions. Throughout this paper, the definition used is the first one.

on Rybowskiak, Garst, Frese, & Batinic, 1999). Entrepreneurial identity captures the degree to which the respondent self-identifies as an entrepreneur (based on Hagger & Chatzisarantis 2006). Career fit confidence is measured in two ways: an individual's assessment of their commitment to the sector relative to others; and capacity to form good relationships with customers and suppliers in their sector of operation (based on Cech et al. 2011).

The survey weights for the *Future of Business* survey were constructed to match the Facebook Page administrator population on variables that are highly predictive of survey response. Given the way in which the sample was selected, as well as the selective attrition across questions, this sample should not be regarded as representative of a clear underlying population.<sup>14</sup>

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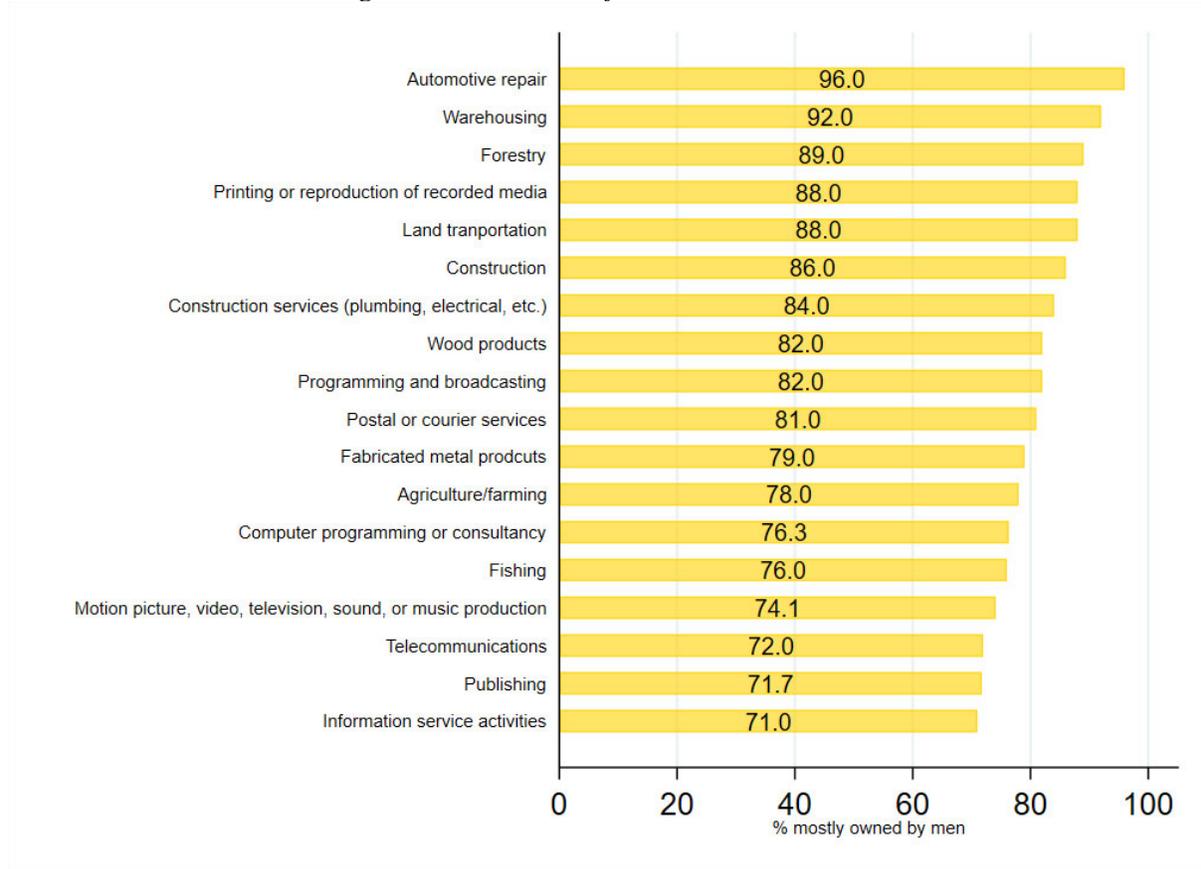
<sup>14</sup> The sampling was designed to be representative of the Facebook business page administrator population and not of any country's business population.

### III. Male-Dominated Sectors

While occupational segregation in employment is typically measured by the Index of Dissimilarity (Duncan, 1955), the classification of a firm into a male-dominated sector or female-dominated sector is currently not well-established. Existing literature often defines a male-dominated sector to be one in which men own more than 50 percent of the firms within that sector or men make up more than 50 percent of the employees in the sector. Rose and Hartmann (2004) classifies a sector as male-dominated if more than half of all workers are male, finding that in most cases male-dominated sectors by this definition were over 65 percent male. Other studies use a 75 percent definition (Hegewisch et al. 2010 and Hegewisch and Matite 2013).

In this paper we define male-dominated sectors based on the question “*who owns most of the businesses in your sector? Men or women?*” as reported by the subset of female respondents.<sup>15</sup> If more than 70 percent of females report that men own most of the business within their sector, we define that sector as male-dominated. Of the 42 sectors, 18 are classified as male-dominated by this definition (Figure 1).<sup>16</sup>

Figure 1. Sectors classified as male-dominated



<sup>15</sup> The female responses were used to classify the sector as male-dominated or female-concentrated since we believe it is important to understand how the female experiences her own sector from the perspective of the female herself. In addition, male responses were highly skewed for this question where the majority of men say that most businesses in their sector are owned by men across the board.

<sup>16</sup> Alternative definitions of male-dominated sectors at 50%, 75% and 90% were analyzed and the results are largely robust across the different definitions.

At first glance, it is evident that sectors that are heavily male-dominated are those that are generally more capital intensive; that is, sectors whose businesses require large amount of investments and equipment (automotive repair, warehousing, land transportation and construction). However, as you go down the list, the next set of male-dominated sectors appear to be more reliant on STEM-type skills, such as information services activities and telecommunication. These service sectors are arguably more labor intensive and perhaps require higher skills investment, of a certain type. They potentially offer a different set of sectors that women could enter without the capital required for the others.

We conduct a similar exercise to define a sector as “female-dominated” if 70 percent or more of female respondents report that women own most of the businesses within their sector. Given the overall lower participation rate of females in entrepreneurship it is not surprising that within this data set, only two sectors can be identified as female-dominated: hairdressing or other beauty treatments (89 percent) and washing or dry cleaning of textiles (73 percent). For this reason, in this paper we refer to the set of non-male dominated sectors (those where less than 70 percent of female respondents reported that men own most the businesses in the sector) as “female-concentrated” (see Appendix B for the list of all sectors and their categorization).

## IV. Results

### *Profitability and Employment of Male-Owned and Female-Owned Firms*

We begin by comparing the number of workers and firm profits across the four categories of firm owners: female crossovers, males in female-concentrated sectors, males in male-dominated sectors and female non-crossovers. We estimate the following OLS estimation:

$$y_{ri} = \alpha + \beta_1 FemaleCrossover_{ri} + \beta_2 MaleFemaleSector_{ri} + \beta_3 MaleMaleSector_{ri} + \delta X_r + \epsilon_i$$

Where  $y_{ri}$  is the outcome of interest for firm  $i$  in region  $r$ .  $FemaleCrossover_{ri}$  is an indicator variable that equals 1 if the firm is female-owned and operates in a male-dominated sector,  $MaleFemaleSector_{ri}$  is an indicator variable that equals 1 if the firm is male-owned and operates in a female-concentrated sector and  $MaleMaleSector_{ri}$  equals to 1 if the firm is male-owned and operates in a male-dominated sector. The omitted category is females in female-concentrated sectors. We report regression estimates controlling for region ( $X_r$ ).

For each outcome we first present a simple difference and then we control for region fixed effects.<sup>17</sup> The results show that male-owned firms, no matter in which sector they operate, have, on average, more workers than female non-crossovers. Men in male-dominated sectors and men in female-concentrated sectors report an average of 59 and 37 more employees than women in non-crossover sectors, respectively. We find no evidence of a statistically significant difference in the number of workers between men in female-concentrated sectors and women crossovers (See the p-value for  $H_0: A=B$  reported at the bottom of the

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<sup>17</sup> To simultaneously deal with skewness and accounting for profits unique properties we apply the inverse hyperbolic sine (IHS) transformation to the profit variable in levels. This transformation is frequently used in lieu of the logarithmic transformation and similarly, its output is read as a percentage change.

table). The difference in the number of workers between women crossovers and women non-crossovers is of the same magnitude but not statistically significant once we control for region.

The results in columns 3 and 4 of Table 2 present the differences in average monthly profits between the categories of firms. A hierarchy of profit earnings emerges: men in male-dominated sectors are the top earners and make statistically significant higher profits than all other categories. Men in male-dominated sectors, men in female-concentrated sectors and female crossovers have 116, 82 and 67 percent statistically significantly higher profits than female non-crossovers, respectively. While different in magnitude, the difference between profits for males in female-concentrated sectors and female crossovers is not statistically different.

**Table 2. Business Performance**

	Number of employees <sup>18</sup>		Profits in the last month (IHS)	
	(1)	(2)	(3)	(4)
Female Crossover [A]	26.979* (15.21)	24.798 (15.20)	0.608*** (0.14)	0.666*** (0.13)
Male in female-concentrated sector[B]	34.515*** (8.07)	36.980*** (8.23)	0.698*** (0.07)	0.817*** (0.07)
Male in male-dominated sector [C]	56.706*** (9.27)	58.726*** (9.41)	1.003*** (0.08)	1.161*** (0.08)
Constant	77.230*** (6.11)	130.904*** (22.67)	6.471*** (0.06)	7.038*** (0.20)
Observations	31,756	31,756	17,351	17,351
Region FE	NO	YES	NO	YES
Developed countries	YES	YES	YES	YES
Developing countries	YES	YES	YES	YES
Mean Female Non-Crossover	77.23	77.23	6.47	6.47
P-value A=B	0.61	0.42	0.50	0.25
P-value A=C	0.06	0.03	0.00	0.00
P-value B=C	0.01	0.01	0.00	0.00
Adjusted R-squared	0.00	0.00	0.01	0.03

Standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Subgroup analysis of the business performance results for developed and developing countries is presented in Table 3. The hierarchy of profits only holds for the developing countries alone (see columns (3) and (4)). Male entrepreneurs in developed countries perform better than female entrepreneurs irrespective of whether they are in a male-dominated or female-concentrated sector. We still find that female non-crossovers have the lowest profits and that female crossovers earn higher profits than female non-crossovers in both developed and developing countries. Specifically, in developed countries, men in male dominated sectors, men in female concentrated sectors and female crossovers have, on average, 134, 130 and 50 percent higher

<sup>18</sup> It should be noted that the distribution of the employees is skewed to the right. The median number of employees is just 2, for both developed and developing economies.

profits than female non-crossovers, respectively. These differences are 90, 53 and 63 percent in the developing economies.

Similarly, in developed countries male-owned firms have more employees than female-owned businesses regardless of sector. In the developed nations, female crossovers do not have more employees than female non-crossovers. However, in developing economies, the number of employees follows the hierarchical pattern found with profits and the female crossovers have statistically significant larger firms than female non-crossovers.

**Table 3. Business Performance: Developed versus Developing**

	Number of employees		Profits in the last month (IHS)	
	Developed	Developing	Developed	Developing
	(1)	(2)	(3)	(4)
Female Crossover [A]	11.393 (31.70)	32.970* (17.33)	0.542* (0.31)	0.628*** (0.15)
Male in female-concentrated sector[B]	58.158*** (17.91)	30.559*** (9.05)	1.297*** (0.17)	0.534*** (0.08)
Male in male-dominated sector [C]	35.428* (20.39)	64.150*** (10.40)	1.337*** (0.19)	0.900*** (0.09)
Constant	90.969*** (12.53)	71.916*** (7.00)	6.345*** (0.12)	6.517*** (0.06)
Observations	7,369	24,387	3,927	13,424
Region FE	NO	NO	NO	NO
Developed countries	YES	NO	YES	NO
Developing countries	NO	YES	NO	YES
Mean Female Non-Crossover	90.97	71.92	6.34	6.52
P-value A=B	0.14	0.89	0.01	0.52
P-value A=C	0.47	0.08	0.01	0.07
P-value B=C	0.27	0.00	0.83	0.00
Adjusted R-squared	0.00	0.00	0.02	0.01

Standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### *Exploring the Factors Correlated with Crossing Over*

In this section we address the question of whether the women who break into male-dominated sectors are different from women who remain in traditionally female sectors. To examine this, we explore potential differences in demographic characteristics, reasons to start a business, role-models and skills between female crossovers and female non-crossovers.

Table 4 presents the OLS regressions of being a female crossover. We recognize the limitations of this analytical approach particularly since the women have already sorted into sectors and we are only able to understand retrospectively what may have influenced their sector choice. However, we believe that this analysis is helpful in identifying potential variables that correlate with the likelihood of being a female

crossover and therefore could reveal encouraging or constraining factors for women who operate in different sectors.

First, we analyze some of the demographic characteristics of female crossovers and how they differ with those of the female non-crossovers. As shown in Table 4, age is negatively associated with being a female crossover. While statistically significant, these effects are very small, one year or more implies an increase in the probability of being crossover by 0.1 percent. We hypothesize that a younger female may be more likely to venture into a sector dominated by men since they are more likely to have been exposed to a more gender equitable set of social norms where working in a male-dominated sector is relatively more acceptable than what was experienced by older cohorts when they chose their profession. The age difference could also reflect a “changing times” effect i.e. if women mostly enter their industry by age X, then by age X+Y they are already settled in an industry – and if over time, industries are becoming less gender biased then the age effect could potentially be picking that up.

In addition, female crossovers are more likely to be married than female non-crossovers. Once we control for the set of socioemotional skills variables, though, this correlation disappears (see columns (5) and (6)). Some of this effect vanishes because we lose a significant proportion of the sample when including these variables (about 35% of the observations) and some of the effect is absorbed by the socioemotional skills variables.<sup>19</sup> Further research is needed to unpack the role of husbands on the higher likelihood of married women being crossovers. As we discuss in the following section, one hypothesis is that the spousal support components of a marriage – emotional and esteem support – provide women with similar advantages as unmarried women’s socioemotional skills.

Female crossovers were less likely to have started their business themselves (column 2) and a chief reason for crossing over seems to be related to the fact that the business was inherited from the family (column 3). Additionally, having a male role model while growing up positively affects the likelihood of crossing over into a male-dominated sector. Specifically, women with a role model are 2 percent more likely to be a crossover. This indicates that early influences in a girl’s life may matter for her economic prosperity. Role models can expose women to new sectors or provide knowledge about career options in higher performing, non-traditional sectors. In addition, role models can relay important information about the profitability of certain sectors. They may also help her navigate unfamiliar business cultures. Other studies have also found that crossovers are more likely to be introduced to their sector relative to non-crossovers by role models, be they fathers, male friends/community members, and other male family members (Campos et al. (2015) and Alibhai et al. (2017)).

In terms of skills, education does not have a significant effect on the probability of being a female crossover. For the socioemotional skills constructs we asked respondents to rate the level of agreement (using a Likert scale) with questions related to their personal level of generalized self-efficacy, error management, entrepreneurial identity and career fit confidence. Higher levels of self-efficacy are positively associated with the probability of being a female crossover (columns 5 and 6). Conversely, females with higher levels

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<sup>19</sup> To capture whether this effect is driven by sample composition, we run the same specification (Table 4) excluding the set of socio-emotional skills variables. We find having a spouse or long-term partner is still positive and significant over being a crossover (1.8 percent significant at the 10 percent level). Part of the change in the coefficient is absorbed by the set of socio-emotional variables and part of the change is due to reduction in the size of the sample.

of entrepreneurial identity and those more committed to stay in the sector are less likely to crossover. Perhaps the male-dominated sectors are difficult for women to navigate and/or the inheritance of the business means she may identify less with the sector. How desirable the male-dominated sectors are for women is difficult to capture in this survey and future work should seek to understand the full set of challenges that women face in operating within them. Appendix D presents the results of Table 4 for developed and developing countries separately. Some of the predictors such as: age, reason to start the business was to make more money and having a male role model, seem to be of greater magnitude in the sample of developing countries. However, the results are not statistically significantly different between the developing and developed.<sup>20</sup>

**Table 4. Crossing over**

	(1)	(2)	(3)	(4)	(5)	(6)
	Female Crossover					
Age of the respondent	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.002*** (0.00)	-0.002*** (0.00)
University or college	-0.007 (0.03)	-0.003 (0.03)	0.032 (0.03)	0.033 (0.03)	0.060 (0.05)	0.066 (0.05)
More than secondary, vocational training or apprenticeship	-0.060* (0.03)	-0.056* (0.03)	-0.018 (0.04)	-0.017 (0.04)	0.015 (0.05)	0.020 (0.05)
Secondary	-0.046 (0.03)	-0.041 (0.03)	-0.010 (0.04)	-0.009 (0.04)	0.018 (0.05)	0.022 (0.05)
Primary	-0.047 (0.04)	-0.039 (0.04)	-0.027 (0.04)	-0.026 (0.04)	-0.009 (0.06)	-0.005 (0.06)
Do you have a spouse or long-term partner?	0.022*** (0.01)	0.023*** (0.01)	0.023*** (0.01)	0.023*** (0.01)	0.012 (0.01)	0.009 (0.01)
Did you start this business?		-0.056*** (0.01)				
<i>Reason to start business</i>						
It is my family business			0.105*** (0.02)	0.104*** (0.02)	0.126*** (0.03)	0.128*** (0.03)
I saw an opportunity in the market			0.021 (0.02)	0.020 (0.02)	-0.002 (0.02)	0.001 (0.02)
I had an idea for a new product or invention			0.013 (0.02)	0.012 (0.02)	0.009 (0.03)	0.015 (0.03)
To be more creative			0.020 (0.02)	0.019 (0.02)	-0.004 (0.03)	-0.003 (0.03)
To make more money			0.030 (0.02)	0.030 (0.02)	0.021 (0.03)	0.026 (0.03)
To be more independent			0.027 (0.02)	0.026 (0.02)	0.019 (0.02)	0.022 (0.02)

<sup>20</sup> Since the focus of this paper is on female crossovers who operate in the economically higher return male-dominated sectors, we do not include Table 4 equivalent analysis for males who operate in female-concentrated sectors. However, one noteworthy result to highlight in the male crossovers analysis is that men who enter female-concentrated sectors were more likely to be motivated to do so to “pursue an interest, hobby, or passion of mine” and “to be more creative” as compared to men in male-dominated sectors. This suggests the reason to cross over and defy any social belief that men belong in certain sectors is arguably based on a more desirable choice variable for men than women. An interesting area for future work would be to study the characteristics of males who break the social norms of masculinity.

To pursue an interest, hobby, or passion of mine			-0.022 (0.02)	-0.022 (0.02)	-0.031 (0.02)	-0.032 (0.02)
I was unhappy with my previous job			-0.009 (0.02)	-0.009 (0.02)	-0.010 (0.03)	-0.011 (0.03)
To have a work and life balance satisfying my needs			0.015 (0.02)	0.014 (0.02)	0.015 (0.02)	0.019 (0.02)
Role model was a man (Unconditional)				0.023** (0.01)	0.015 (0.01)	0.016 (0.01)
<i>Non-Cognitive Skills</i>						
Generalized self-efficacy					0.020** (0.01)	0.020** (0.01)
Error management Score					-0.006 (0.01)	-0.006 (0.01)
Entrepreneurial identity					-0.010** (0.00)	-0.011** (0.00)
Career Fit Confidence: More Committed to staying in sector					-0.008** (0.00)	-0.008** (0.00)
Career Fit Confidence: Good relationships in sector					-0.002 (0.01)	-0.002 (0.01)
Constant	0.169*** (0.03)	0.211*** (0.03)	0.117*** (0.04)	0.113*** (0.04)	0.143** (0.06)	0.165** (0.07)
Observations	10,691	10,628	7,958	7,958	5,113	5,113
Region FE	NO	NO	NO	NO	NO	YES
Adjusted R-squared	0.01	0.01	0.02	0.02	0.03	0.03

In Table 5, we investigate further the role of husbands in helping women to cross over, restricting analysis to the 75 percent female owners/managers whom are married. We include variables that capture the different types of help the husband could provide to his wife's business.

Among married women, seeing an opportunity in the market, to make more money and to be more independent are positively associated with a female crossing over into a male-dominated sector. These reasons are particularly pertinent in the developing economies<sup>21</sup> and these finding are consistent with the results of the Global Entrepreneurship Monitor where the likelihood of necessity being cited as the reason for starting a business declines with higher economic development (GEM, 2016).

Additionally, we explore the role of the husband in the business. There is some literature which examined a husband's role in women's careers, concluding that husband's impact women's choices and career aspirations (Still and Timms, 1998; O'Neil and Bilimoria, 2005; Vanhala, 2005). In Ethiopia, women entrepreneurs fare better with support from their husband. Eighty-three percent of married women said their husband helped in the business in some way (mainly by contributing start-up money) and women were more likely to enter into more profitable male-dominated sectors when their husband was an entrepreneur himself (Alibhai et al. 2017). Wolf (2018) classifies the husbands of Ethiopian business women into three

<sup>21</sup> Appendix D shows these results separately for developed and developing countries.

profiles: The Indifferent, the Copreneurs and the Regulators, depending on the degree to which the husband showed helpful and hindering behaviors. The Copreneurs are husbands who show low levels of constraining behavior and high levels of supportive behaviors; the Regulators show high levels of both constraining and supportive behaviors; the Indifferent show rather low levels of both constraining and supportive behaviors. Women entrepreneurs in Ethiopia are most successful (higher profits and more employees) when married to husbands who provide resources for the business (cf. the Copreneurs and Regulators) – even when those husbands at the same time engage in constraining behavior (cf. the Regulators). Women perform worst when their entrepreneurial efforts are ignored by their husband (cf. the Indifferent). Husbands who share their financial, social, and human capital resources with their wives can make a significant difference.

Nearly half of married female owners report having received some type of help in their business from their husband, but this help is not statistically significantly different between crossover and non-crossover women. However, some types of spousal help can increase the probability of crossing over while other types of help may hinder it. Specifically, contributing with money or giving moral support negatively impacts the probability of being a crossover in 2.4 percent and 12 percent respectively, while helping to procure a license, being a co-owner or helping with several aspects of the business is associated with a significantly higher probability of being a crossover.

**Table 5. Support from husband**

	(1)	(2)
	Female Crossover	
Age of the respondent	-0.002*** (0.00)	-0.002*** (0.00)
University or college	0.000 (0.04)	-0.003 (0.04)
More than secondary, vocational training or apprenticeship	-0.046 (0.04)	-0.049 (0.04)
Secondary	-0.038 (0.04)	-0.038 (0.04)
Primary	-0.059 (0.05)	-0.059 (0.05)
<i>Reason to start business</i>		
It is my family business	0.115*** (0.02)	0.112*** (0.02)
I saw an opportunity in the market	0.038* (0.02)	0.037 (0.02)
I had an idea for a new product or invention	0.024 (0.03)	0.025 (0.03)
To be more creative	0.006 (0.03)	0.007 (0.03)
To make more money	0.044* (0.02)	0.050** (0.02)
To be more independent	0.035* (0.02)	0.038* (0.02)

To pursue an interest, hobby, or passion of mine	-0.024 (0.02)	-0.024 (0.02)
I was unhappy with my previous job	-0.004 (0.03)	-0.004 (0.03)
To have a work and life balance satisfying my needs	0.015 (0.02)	0.017 (0.02)
Role model was a man (Unconditional)	0.019* (0.01)	0.017 (0.01)
Spouse helps	0.009 (0.01)	
<i>Ways in which your spouse helps</i>		
He contributed money		-0.024*** (0.01)
He gave me advice		0.012 (0.01)
He helped me register with authorities and get a license		0.043*** (0.01)
He is co-owner		0.115*** (0.03)
He gives me moral support		-0.119** (0.06)
He helped me as labor force		-0.031 (0.06)
All of the above		0.150*** (0.05)
Other		0.020 (0.02)
Constant	0.177*** (0.05)	0.209*** (0.05)
Observations	5,916	5,916
Region FE	NO	YES
Developed countries	YES	YES
Developing countries	YES	YES
Adjusted R-squared	0.02	0.03

Standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### *Characteristics of the Business: Female Crossovers, Non-Crossovers and Males in Male-Dominated Sectors*

Female crossovers work on average 2.4 hours per week more than female owners in traditionally female sectors. These findings are consistent with existing literature which indicates that at least for wage work in the U.S., women in male-dominated sectors work longer hours than women in female-dominated sectors (Rose and Hartmann, 2004). However, compared to the male peers in male dominated sectors, female crossovers work 1.5 hours fewer, and this pattern is more pronounced in developed countries (See Appendix D).

In terms of the sex of employees, female firms in male-dominated sectors have a lower share of female employees than non-crossovers. However, these crossovers have a higher share of female workers than male owned firms in male-dominated sectors: 74 to 61 percent.

As noted above, male dominated sectors are more capital intensive. Hence, it is not a surprise to find that female crossovers are significantly more likely to have a line of credit or loan from a financial institution than non-crossovers. Interestingly, female-owned firms in male dominated sectors are also more likely to have credit than male-owned firms in the same sector. This could be due to lower assets to draw upon in capitalizing the business. Indeed, as shown in appendix D, this latter pattern does not hold for developed countries, where capital markets are arguably more developed and one may not have to rely so much on personal assets to capitalize the business.

Taking a closer look at the start-up funding sources for the business, we find women in the higher return crossover sectors are relying more on family inheritance and savings provided by their spouse to start the business. Men in male-dominated sectors, on the other hand, are more likely to be able to draw from own savings and loans from relatives and friends to start the business, relative to women. In keeping with the finding on current loans, in developing countries, crossover women were also more likely to obtain group loans and loans from a bank to start the business relative to men in the same sectors (differences are small but significant – see Appendix D). The few women who have crossed over are possibly a unique group who have been able to access loans to start and operate their business.

When we turn to ownership, we find that female crossover firms are significantly more likely to have a business partner while female non-crossovers and male firms in male dominated sectors tend to be single ownership. Perhaps female owners within these industries are relying on family ties or male networks to enter and operate in these sectors. Indeed, among the firms with multiple owners, crossovers say that 79% of their firms have half or more than half male owners, while for non-crossovers this figure is 60%.

Finally, in terms of outlook, female non-crossovers are significantly more likely than either female crossovers or male firms to say that a lack of job prospects is a major issue in the respondent's community. This could possibly indicate their lower earnings translating into a (slightly) more pessimistic outlook. This finding is present only for developed countries.

**Table 6. Firms Characteristics**

Variable	(1) Female Crossover		(2) Female non- crossover		(3) Male in male dominated sectors		t-test (1)-(2)	t-test (1)-(3)
	N	Mean/SE	N	Mean/SE	N	Mean/SE	Difference	Difference
Number of hours work per week	1907	38.53 [0.610]	9934	36.09 [0.263]	7833	40.03 [0.314]	2.433***	-1.509**
Number of years work in this sector	2900	4.50 [0.067]	15448	5.27 [0.030]	10833	4.28 [0.034]	-0.768***	0.223***
Share of female workers	3237	74% [0.006]	17264	87% [0.002]	12362	61% [0.004]	-0.127***	0.126***
Line of credit or loan from a bank or financial institution	2328	31% [0.010]	12474	24% [0.004]	8987	28% [0.005]	0.064***	0.027**
<i>Ownership</i>								
More than one owner	2831	63% [0.009]	14507	43% [0.004]	10285	38% [0.005]	0.203***	-0.249***
Single owner	2831	37% [0.009]	14507	57% [0.004]	10285	62% [0.005]	-0.203***	0.043***
<i>Challenges in your community</i>								
A lack of opportunities for women and girls	1957	25% [0.010]	10157	25% [0.004]	7831	21% [0.005]	-0.002	0.043***
Not enough job prospects	1957	51% [0.011]	10157	54% [0.005]	7831	51% [0.006]	-0.030**	0.002
<i>Where did most of the starting money or funding for this business come from?</i>								
I'm not sure	2652	0.158 [0.007]	13891	0.132 [0.003]	18538	0.149 [0.004]	0.026***	0.008
Group savings	2652	0.054 [0.004]	13891	0.055 [0.002]	18538	0.047 [0.002]	-0.001	0.007
Loan from a bank or financial institution	2652	0.129 [0.007]	13891	0.133 [0.003]	18538	0.119 [0.003]	-0.003	0.011
Loan from relatives or friends	2652	0.063 [0.005]	13891	0.089 [0.002]	18538	0.079 [0.003]	-0.025***	-0.015***
Family inheritance	2652	0.092 [0.006]	13891	0.064 [0.002]	18538	0.087 [0.003]	0.028***	0.005
Spouse or partner's savings	2652	0.070 [0.005]	13891	0.080 [0.002]	18538	0.023 [0.001]	-0.010*	0.047***
Own savings	2652	0.400 [0.010]	13891	0.398 [0.004]	18538	0.466 [0.005]	0.001	-0.066***
Other	2652	0.034 [0.003]	13891	0.050 [0.002]	18538	0.030 [0.002]	-0.016***	0.003

The value displayed for t-tests are the differences in the means across the groups.

## V. Conclusion

Using results from the *Future of Business* survey among small businesses on Facebook in 97 countries, this paper studies sectoral segregation on a global level. Consistent with previous research, we find that women who enter male-dominated sectors earn higher profits than women who remain in traditionally female-concentrated sectors. Second, a hierarchy of earnings (“the profitarchy”) emerges whereby men in male-dominated sectors earn the most; women in male-dominated sectors and men in female-concentrated sectors in the middle tier; and women in female-concentrated sectors at the bottom. This particular pattern is driven mostly by the developing economies. In developed economies, the “profitarchy” takes the form of male-owned firms, either in male-dominated sectors or female-concentrated sectors, being more profitable than women in any sector.

While we do document some differences across developing and developed countries in factors surrounding sectoral segregation, what is striking is the large area of commonality. Recent work (e.g. Goldin, 2014) has shown a decline in occupational segregation in wage work in the United States. However, sectoral segregation among entrepreneurs, and the gender earnings gap, remains large and persistent across the world.

Women engaged in male-dominated sectors are less likely to have started their business themselves and were more likely to have inherited the business from family when compared to women in female-concentrated sectors, but this is only part of the story. Mentorship, particularly from men, is important: we observe that women in male-dominated sectors are more likely to have had a male role model while growing up. These findings are consistent with having better support networks that could assist women to enter non-traditional business sectors and circumvent some of the challenges they may face. Conversely, women who break into male-dominated sectors do not seem to have more education, and capital does not appear to be a particularly binding constraint to the women who have managed to cross over.

In terms of creating programs to support greater rates of crossing over, it is possible that carefully chosen apprenticeship or mentoring programs could help provide the same kind of support that a role model does. A key programmatic aspect would be to target younger women, ideally before they choose a career. When introducing potential career paths to young women, highlighting the earnings potential and the growth in female representation in non-traditional sectors could also motivate them to pursue a career in that industry.

In addition to mentoring, it could be important to support potential crossover women with socioemotional skills training. We find that crossovers have higher self-efficacy, a socioemotional skill often associated with entrepreneurial success. In addition, the finding that certain types of spousal support can be influential for breaking into male-dominated trades suggests another programmatic approach could be to explore and improve the intrahousehold dynamics. In particular, a spouse only providing funds or moral support is associated with a lower likelihood of breaking gender occupational norms, while help with running the business as well as multi-faceted support are positive forces. Nurturing collaboration between a husband and wife’s business endeavors to capitalize on complementary skills could enhance overall performance.

Given the persistence of sectoral segregation around the world, as well as the misallocation of factors it presents, tackling this global problem with a multifaceted program will not only improve equity, it will make us all better off.

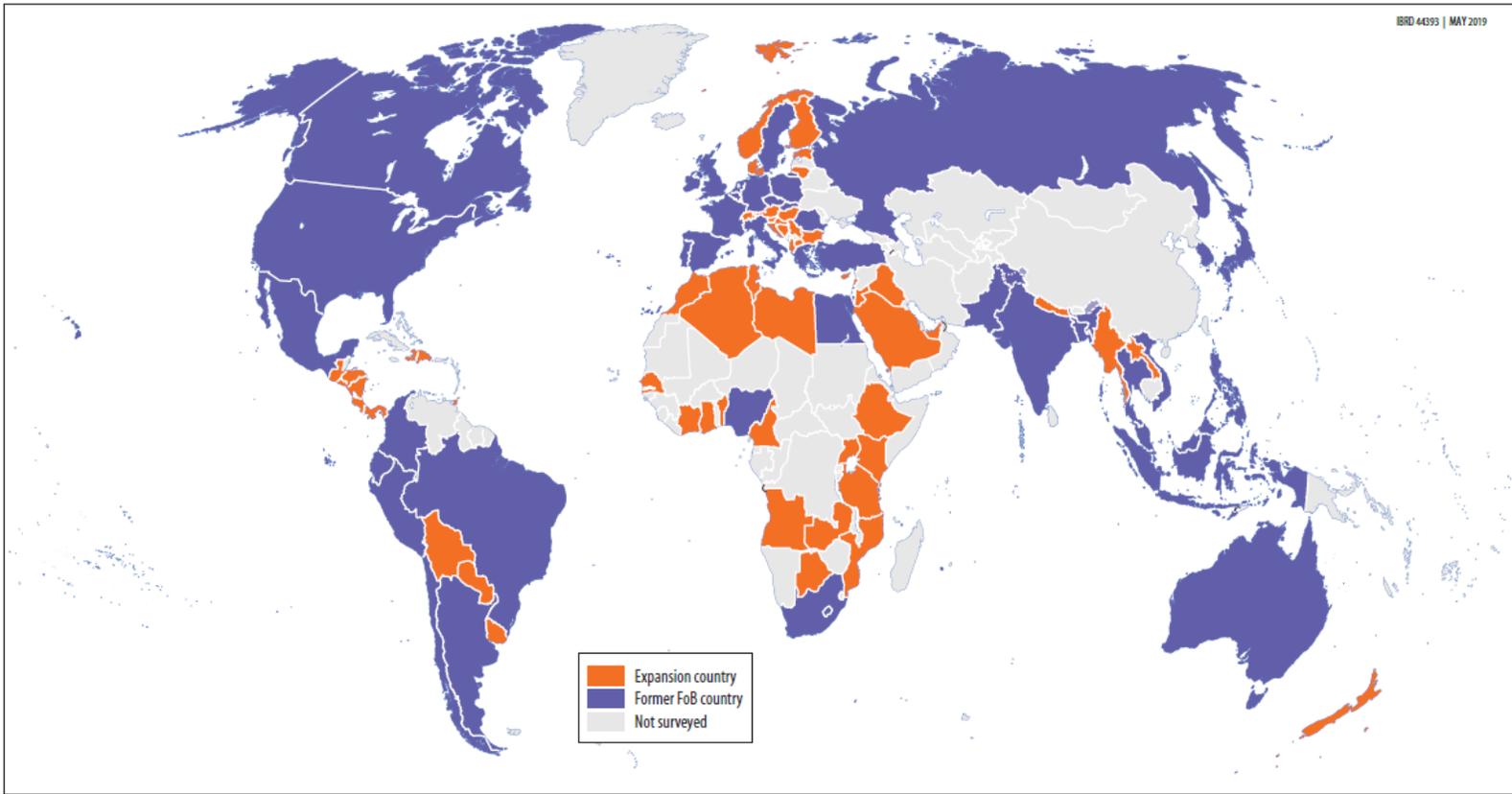
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*Appendix A: Geographic Coverage of the December 2018 Future of Business Survey Wave*

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Note: The blue countries were in the original FoB survey. The orange countries were successfully added in December 2018 wave of the survey

*Appendix B: Sample size and distribution of female respondents by country*

	<i>N</i>	<i>Proportion of female respondents</i>	<i>SD</i>
Albania	297	27%	0.44
Algeria	432	12%	0.32
Angola	264	11%	0.31
Argentina	613	55%	0.5
Australia	627	49%	0.5
Austria	526	39%	0.49
Bangladesh	918	7%	0.25
Belgium	605	39%	0.49
Benin	202	9%	0.29
Bolivia	530	32%	0.46
Bosnia	289	32%	0.47
Botswana	266	29%	0.45
Brazil	641	50%	0.5
Bulgaria	979	48%	0.5

Cameroon	238	17%	0.38
Canada	584	54%	0.5
Chile	535	45%	0.5
Colombia	502	35%	0.48
Croatia	1359	45%	0.5
Cyprus	345	31%	0.46
Czech Republic	722	41%	0.49
Côte d'Ivoire	314	19%	0.39
Denmark	448	38%	0.49
Dominican Republic	629	39%	0.49
Ecuador	595	35%	0.48
Egypt, Arab Rep.	815	12%	0.33
El Salvador	453	40%	0.49
Estonia	337	41%	0.49
Ethiopia	233	6%	0.24
Finland	576	47%	0.5
France	652	41%	0.49
Germany	550	34%	0.47
Ghana	660	20%	0.4
Greece	636	31%	0.46
Guatemala	499	35%	0.48
Haiti	188	15%	0.36
Honduras	301	38%	0.49
Hong Kong SAR, China	705	34%	0.47
Hungary	622	44%	0.5
India	1087	10%	0.3
Indonesia	844	30%	0.46
Iraq	738	7%	0.25
Ireland	655	47%	0.5
Israel	892	40%	0.49
Italy	591	34%	0.47
Japan	856	23%	0.42
Jordan	872	16%	0.37
Kenya	609	28%	0.45
Lao PDR	141	33%	0.47
Lebanon	721	22%	0.41
Libya	434	11%	0.31
Lithuania	483	41%	0.49
Macedonia	312	26%	0.44
Malaysia	720	36%	0.48
Mexico	583	38%	0.49
Morocco	706	14%	0.35
Mozambique	214	10%	0.3
Myanmar	994	25%	0.43

Nepal	655	7%	0.26
Netherlands	619	49%	0.5
New Zealand	557	56%	0.5
Nicaragua	256	40%	0.49
Nigeria	1321	17%	0.37
Norway	630	38%	0.49
Pakistan	844	8%	0.27
Panama	201	39%	0.49
Paraguay	437	42%	0.49
Peru	579	33%	0.47
Philippines	717	52%	0.5
Poland	643	43%	0.5
Portugal	616	43%	0.5
Romania	657	37%	0.48
Russian Federation	682	42%	0.49
South Korea	556	21%	0.41
Saudi Arabia	701	7%	0.26
Senegal	172	21%	0.41
Serbia	651	37%	0.48
Singapore	537	40%	0.49
Slovak Republic	597	37%	0.48
Slovenia	313	39%	0.49
South Africa	544	38%	0.48
Spain	661	46%	0.5
Sweden	568	38%	0.49
Switzerland	589	42%	0.49
Taiwan, China	796	36%	0.48
Tanzania	327	12%	0.32
Thailand	949	49%	0.5
Trinidad and Tobago	270	50%	0.5
Tunisia	660	18%	0.38
Turkey	677	11%	0.32
United Arab Emirates	131	24%	0.43
United Kingdom	732	48%	0.5
United States	568	55%	0.5
Uganda	488	17%	0.38
Uruguay	709	61%	0.49
Vietnam	856	29%	0.45
Zambia	327	19%	0.39
Total	55932	33%	0.47

*Appendix C: Sector Classification*

<b>Main Industry</b>	<b>Sector</b>	<b>Men own most of the businesses in the sector</b>	<b>Sector Classification</b>
General, personal, or business services	Hairdressing or other beauty treatments	10.54%	Female-Concentrated
General, personal, or business services	Washing or dry-cleaning of textiles	27.50%	Female-Concentrated
Manufacturing	Textiles and apparel	31.30%	Female-Concentrated
Agriculture	Mining/quarrying	33.33%	Female-Concentrated
Human health and social work activities	Social work activities	33.79%	Female-Concentrated
Human health and social work activities	Residential care activities	34.44%	Female-Concentrated
Human health and social work activities	Human health activities	38.27%	Female-Concentrated
General, personal, or business services	Repair of computers or household goods	42.55%	Female-Concentrated
Arts, entertainment, and recreation	Creative, arts, and entertainment activities	45.36%	Female-Concentrated
General, personal, or business services	Cleaning activities	47.97%	Female-Concentrated
Retail and wholesale sales	Retail trade	48.53%	Female-Concentrated
Arts, entertainment, and recreation	Libraries, archives, museums, or other cultural activities	48.61%	Female-Concentrated
Transportation and storage	Air transportation	52.00%	Female-Concentrated
General, personal, or business services	Information services	55.56%	Female-Concentrated
Arts, entertainment, and recreation	Gambling and betting activities	56.25%	Female-Concentrated
Food services and accommodation	Food and beverage services (e.g. a restaurant)	57.26%	Female-Concentrated
Arts, entertainment, and recreation	Sports activities, amusement, or recreation	57.77%	Female-Concentrated
Retail and wholesale sales	Wholesale trade	62.30%	Female-Concentrated
General, personal, or business services	Funeral services	63.16%	Female-Concentrated
Manufacturing	Food and beverage production	65.12%	Female-Concentrated
Transportation and storage	Water transportation	66.67%	Female-Concentrated
Food services and accommodation	Accommodation	68.31%	Female-Concentrated

Manufacturing	Chemicals	69.57%	Female-Concentrated
General, personal, or business services	Computer programming or consultancy	69.63%	Female-Concentrated
Information and communication	Information service activities	70.99%	Male-Dominated
Information and communication	Publishing	71.74%	Male-Dominated
Information and communication	Telecommunications	71.96%	Male-Dominated
Information and communication	Motion picture, video, television, sound, or music production	74.07%	Male-Dominated
Agriculture	Fishing	76.19%	Male-Dominated
Agriculture	Agriculture/farming	78.03%	Male-Dominated
Manufacturing	Fabricated metal products	78.67%	Male-Dominated
Transportation and storage	Postal or courier services	80.95%	Male-Dominated
Information and communication	Programming and broadcasting	82.05%	Male-Dominated
Manufacturing	Wood products	82.26%	Male-Dominated
Information and communication	Computer programming or consultancy	82.97%	Male-Dominated
General, personal, or business services	Construction services (plumbing, electrical, etc.)	84.34%	Male-Dominated
Manufacturing	Construction	86.49%	Male-Dominated
Manufacturing	Printing or reproduction of recorded media	88.00%	Male-Dominated
Transportation and storage	Land transportation	88.27%	Male-Dominated
Agriculture	Forestry	88.89%	Male-Dominated
Transportation and storage	Warehousing	91.67%	Male-Dominated
Retail and wholesale sales	Automotive repair	96.05%	Male-Dominated

*Appendix D: Crossing Over – developed versus developing analysis*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	<b>Female Crossover</b>									
	Developed	Developing	Developed	Developing	Developed	Developing	Developed	Developing	Developed	Developing
Age of the respondent	-0.001 (0.00)	-0.001** (0.00)	-0.001 (0.00)	-0.001*** (0.00)	-0.001 (0.00)	-0.001*** (0.00)	-0.001 (0.00)	-0.001*** (0.00)	-0.001 (0.00)	-0.002*** (0.00)
University or college	-0.003 (0.06)	-0.009 (0.04)	-0.003 (0.06)	-0.004 (0.04)	0.046 (0.07)	0.028 (0.04)	0.048 (0.07)	0.028 (0.04)	0.044 (0.09)	0.065 (0.06)
More than secondary, vocational training or apprenticeship	-0.048 (0.06)	-0.066* (0.04)	-0.049 (0.06)	-0.060 (0.04)	0.005 (0.07)	-0.027 (0.04)	0.006 (0.07)	-0.026 (0.04)	0.018 (0.09)	0.012 (0.06)
Secondary	-0.048 (0.06)	-0.045 (0.04)	-0.046 (0.06)	-0.039 (0.04)	-0.015 (0.07)	-0.007 (0.04)	-0.014 (0.07)	-0.006 (0.04)	-0.003 (0.09)	0.020 (0.06)
Primary	-0.042 (0.07)	-0.049 (0.05)	-0.041 (0.07)	-0.037 (0.05)	-0.008 (0.08)	-0.033 (0.05)	-0.007 (0.08)	-0.031 (0.05)	-0.041 (0.11)	-0.004 (0.07)
Do you have a spouse or long-term partner?	0.029** (0.01)	0.020** (0.01)	0.030** (0.01)	0.022*** (0.01)	0.030* (0.02)	0.020** (0.01)	0.030* (0.02)	0.020** (0.01)	0.020 (0.02)	0.019* (0.01)
Did you start this business?			-0.029** (0.01)	-0.068*** (0.01)						
<i>Reason to start business</i>										
It is my family business					0.150*** (0.04)	0.090*** (0.02)	0.149*** (0.04)	0.089*** (0.02)	0.168*** (0.05)	0.115*** (0.03)
I saw an opportunity in the market					0.007 (0.04)	0.027 (0.02)	0.007 (0.04)	0.025 (0.02)	0.013 (0.05)	-0.006 (0.03)
I had an idea for a new product or invention					0.030 (0.05)	0.012 (0.03)	0.030 (0.05)	0.010 (0.03)	0.097 (0.07)	-0.003 (0.03)
To be more creative					-0.019 (0.04)	0.033 (0.02)	-0.019 (0.04)	0.032 (0.02)	-0.031 (0.06)	0.005 (0.03)
To make more money					-0.027 (0.04)	0.046** (0.02)	-0.027 (0.04)	0.046** (0.02)	-0.025 (0.06)	0.030 (0.03)
To be more independent					0.032 (0.04)	0.027 (0.02)	0.032 (0.04)	0.026 (0.02)	0.027 (0.04)	0.016 (0.03)

To pursue an interest, hobby, or passion of mine					-0.024 (0.03)	-0.021 (0.02)	-0.024 (0.03)	-0.022 (0.02)	-0.033 (0.04)	-0.032 (0.03)
I was unhappy with my previous job					-0.029 (0.04)	0.001 (0.03)	-0.029 (0.04)	0.001 (0.03)	-0.052 (0.06)	0.011 (0.04)
To have a work and life balance satisfying my needs					-0.005 (0.03)	0.023 (0.02)	-0.005 (0.03)	0.022 (0.02)	-0.001 (0.04)	0.022 (0.03)
Role model was a man (Unconditional)							0.020 (0.02)	0.024** (0.01)	0.002 (0.02)	0.021 (0.01)
<i>Non-Cognitive Skills</i>										
Generalized self-efficacy									0.031* (0.02)	0.016 (0.01)
Error management Score									0.011 (0.02)	-0.011 (0.01)
Entrepreneurial identity									-0.019** (0.01)	-0.007 (0.01)
Career Fit Confidence: More Committed to staying in sector									-0.007 (0.01)	-0.008** (0.00)
Career Fit Confidence: Good relationships in sector									-0.012 (0.01)	0.001 (0.01)
Constant	0.153** (0.06)	0.176*** (0.04)	0.174*** (0.06)	0.230*** (0.04)	0.105 (0.08)	0.117** (0.05)	0.101 (0.08)	0.113** (0.05)	0.104 (0.12)	0.157** (0.08)
Observations	2,981	7,710	2,967	7,661	2,084	5,874	2,084	5,874	1,381	3,732
Adjusted R-squared	0.00	0.01	0.01	0.01	0.02	0.01	0.02	0.02	0.03	0.02

*Spouse's help - developed versus developing countries*

	(1)	(2)	(3)	(4)
	Developed	Developing	Developed	Developing
Age of the respondent	-0.001*	-0.002***	-0.001	-0.002***
	(0.00)	(0.00)	(0.00)	(0.00)
University or college	0.009	-0.004	0.004	-0.007
	(0.08)	(0.05)	(0.08)	(0.05)
More than secondary, vocational training or apprenticeship	-0.035	-0.054	-0.039	-0.055
	(0.08)	(0.05)	(0.08)	(0.05)
Secondary	-0.056	-0.033	-0.058	-0.033
	(0.08)	(0.05)	(0.08)	(0.05)
Primary	-0.053	-0.060	-0.054	-0.061
	(0.10)	(0.06)	(0.10)	(0.06)
<i>Reason to start business</i>				
It is my family business	0.172***	0.095***	0.174***	0.091***
	(0.05)	(0.03)	(0.05)	(0.03)
I saw an opportunity in the market	0.006	0.050*	0.010	0.047*
	(0.04)	(0.03)	(0.04)	(0.03)
I had an idea for a new product or invention	0.048	0.022	0.056	0.017
	(0.06)	(0.03)	(0.06)	(0.03)
To be more creative	-0.044	0.023	-0.038	0.021
	(0.05)	(0.03)	(0.05)	(0.03)
To make more money	-0.022	0.066**	-0.011	0.067**
	(0.05)	(0.03)	(0.05)	(0.03)
To be more independent	0.021	0.042*	0.023	0.042*
	(0.04)	(0.02)	(0.04)	(0.02)
To pursue an interest, hobby, or passion of mine	-0.039	-0.019	-0.030	-0.021
	(0.04)	(0.02)	(0.04)	(0.02)
I was unhappy with my previous job	-0.020	0.001	-0.008	0.001
	(0.05)	(0.04)	(0.05)	(0.04)
To have a work and life balance satisfying my needs	-0.015	0.028	-0.009	0.027
	(0.04)	(0.03)	(0.04)	(0.03)
Role model was a man (Unconditional)	0.005	0.025**	0.001	0.023*
	(0.02)	(0.01)	(0.02)	(0.01)
Spouse helps	-0.012	0.020*		
	(0.02)	(0.01)		
<i>Ways in which your spouse helps</i>				
He contributed money			-0.043**	-0.018*
			(0.02)	(0.01)
He gave me advice			-0.003	0.017
			(0.02)	(0.01)
He helped me register with authorities and get a license			0.059***	0.038***
			(0.02)	(0.01)

			0.157**	0.100***
	He is co-owner		(0.07)	(0.04)
	He gives me moral support		-0.116	-0.114
			(0.09)	(0.08)
	He helped me as labor force		-0.081	-0.032
			(0.12)	(0.06)
	All of the above		0.003	0.200***
			(0.10)	(0.06)
	Other		0.001	0.026
			(0.03)	(0.02)
Constant		0.198**	0.164***	0.191**
		(0.09)	(0.06)	(0.09)
Observations		1,626	4,290	1,626
Region FE		NO	NO	NO
Developed countries		YES	YES	YES
Developing countries		YES	YES	YES
Adjusted R-squared		0.03	0.02	0.03

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

*Firms Characteristics – developed versus developing countries (results in separate tables)*

**Firms Characteristics - Developed Countries**

Variable	(1) Female Crossover		(2) Female non- crossover		(3) Male in male dominated sectors		t-test (1)-(2)	t-test (1)-(3)
	N	Mean/SE	N	Mean/SE	N	Mean/SE	Difference	Difference
Number of hours work per week	493	41.857 [1.051]	2729	39.241 [0.439]	1687	45.670 [0.538]	2.616**	-3.813***
Number of years work in this sector	780	3.609 [0.123]	4305	4.385 [0.055]	2384	3.063 [0.063]	-0.776***	0.546***
Share of female workers	870	0.749 [0.011]	4721	0.883 [0.003]	2664	0.604 [0.008]	-0.133***	0.145***
Line of credit or loan from a bank or financial institution	610	0.323 [0.019]	3329	0.262 [0.008]	1942	0.334 [0.011]	0.061***	-0.011
<i>Ownership</i>								
More than one owner	870	0.505 [0.017]	4721	0.338 [0.007]	2664	0.326 [0.009]	0.167***	0.179***
Single owner	870	0.370 [0.016]	4721	0.506 [0.007]	2664	0.562 [0.010]	-0.136***	-0.192***
<i>Challenges in your community</i>								
A lack of opportunities for women and girls	487	0.263 [0.020]	2626	0.247 [0.008]	1596	0.200 [0.010]	0.016	0.063***
Not enough job prospects	487	0.513 [0.023]	2626	0.605 [0.010]	1596	0.511 [0.013]	-0.092***	0.003
<i>Where did most of the starting money or funding for this business come from?</i>								
I'm not sure	684	0.167 [0.014]	3732	0.165 [0.006]	3639	0.163 [0.008]	0.002	0.004
Group savings	684	0.039 [0.007]	3732	0.041 [0.003]	3639	0.038 [0.004]	-0.002	0.001
Loan from a bank or financial institution	684	0.136 [0.013]	3732	0.152 [0.006]	3639	0.139 [0.007]	-0.016	-0.003
Loan from relatives or friends	684	0.058 [0.009]	3732	0.067 [0.004]	3639	0.051 [0.005]	-0.009	0.007
Family inheritance	684	0.091 [0.011]	3732	0.063 [0.004]	3639	0.074 [0.006]	0.028***	0.016
Spouse or partner's savings	684	0.057 [0.009]	3732	0.062 [0.004]	3639	0.016 [0.003]	-0.005	0.041***
Own savings	684	0.414 [0.019]	3732	0.385 [0.008]	3639	0.484 [0.011]	0.028	-0.070***
Other	684	0.038 [0.007]	3732	0.065 [0.004]	3639	0.034 [0.004]	-0.027***	0.004

The value displayed for t-tests are the differences in the means across the groups.

\*\*\*, \*\*, and \* indicate significance at the 1, 5, and 10 percent critical level.

### Firms Characteristics - Developing Countries

Variable	(1) Female Crossover		(2) Female non- crossover		(3) Male in male dominated sectors		t-test (1)-(2)	t-test (1)-(3)
	N	Mean/SE	N	Mean/SE	N	Mean/SE	Difference	Difference
Number of hours work per week	1414	37.363 [0.734]	7205	34.898 [0.321]	11019	38.487 [0.370]	2.465***	-1.124
Number of years work in this sector	2120	4.829 [0.079]	11143	5.611 [0.035]	16050	4.620 [0.038]	-0.782***	0.208**
Share of female workers	2367	0.736 [0.007]	12543	0.860 [0.002]	18491	0.616 [0.004]	-0.125***	0.120***
Line of credit or loan from a bank or financial institution	1718	0.302 [0.011]	9145	0.237 [0.004]	12919	0.266 [0.005]	0.065***	0.036***
<i>Ownership</i>								
More than one owner	2367	0.571 [0.010]	12543	0.370 [0.004]	18491	0.317 [0.005]	0.201***	0.254***
Single owner	2367	0.303 [0.009]	12543	0.469 [0.004]	18491	0.499 [0.005]	-0.166***	-0.196***
<i>Challenges in your community</i>								
A lack of opportunities for women and girls	1470	0.243 [0.011]	7531	0.251 [0.005]	11351	0.206 [0.005]	-0.009	0.037***
Not enough job prospects	1470	0.514 [0.013]	7531	0.522 [0.006]	11351	0.512 [0.006]	-0.008	0.002
<i>Where did most of the starting money or funding for this business come from?</i>								
I'm not sure	1968	0.154 [0.008]	10159	0.120 [0.003]	14899	0.145 [0.004]	0.035***	0.009
Group savings	1968	0.059 [0.005]	10159	0.060 [0.002]	14899	0.049 [0.002]	-0.000	0.010*
Loan from a bank or financial institution	1968	0.127 [0.008]	10159	0.126 [0.003]	14899	0.113 [0.004]	0.001	0.014*
Loan from relatives or friends	1968	0.065 [0.006]	10159	0.097 [0.003]	14899	0.086 [0.003]	-0.032***	-0.021***
Family inheritance	1968	0.092 [0.007]	10159	0.064 [0.002]	14899	0.091 [0.003]	0.029***	0.002
Spouse or partner's savings	1968	0.075 [0.006]	10159	0.087 [0.003]	14899	0.025 [0.002]	-0.012*	0.050***
Own savings	1968	0.395 [0.011]	10159	0.403 [0.005]	14899	0.461 [0.006]	-0.008	-0.066***
Other	1968	0.032 [0.004]	10159	0.044 [0.002]	14899	0.029 [0.002]	-0.012**	0.003

The value displayed for t-tests are the differences in the means across the groups.

\*\*\*, \*\*, and \* indicate significance at the 1, 5, and 10 percent critical level.