

# The Gender Gap in Firm Leadership: The Role of Religion, and its Impact on Firm Growth

Liu Zhang

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Abstract

In the developing world, despite notable progress in education, women's representation in the workforce, particularly in leadership roles, remains disproportionately low. Going beyond conventional explanations, this study explores the role of religion. The analysis reveals that the proportion of female-led firms is positively associated with the population share of Buddhists, negatively associated with Muslim share, and uncorrelated with Christian share. After accounting for the gender gap in human capital and labor participation, quality of governance, and share of women in parliament, Muslims' effect vanishes while Buddhists maintain a positive impact on female firm representation, suggesting explanations beyond these channels. I turn to individual-level analysis with World Value Survey data to explore the effect of religions on attitudes towards gender, generalized trust, and the desire for success. Support for gender equality increases with both Buddhist and Christian shares but decreases with Muslim share. Only Buddhist share is positively associated with generalized trust and negatively associated with the desire for success, and the effects are stronger among men. Using a global firm dataset, I show that women-led firms are disproportionately more productive with higher Buddhist share. Furthermore, I examine female top manager's impact on firm productivity, innovation, and scale expansion and find that women-led firms have higher total factor productivity but smaller expansion rates in terms of employment and fixed assets.

# 1 Introduction

Despite significant structural and social change, the share of women working or seeking jobs in the developing world has not increased much relative to the improvements in education attainment. In 2010, the ratio of female to male labor force participation rate (LFPR) in low and mid-income countries was 63.7, whereas the ratio of female to male post-secondary education enrollment rate exceeded one. Figure 1 illustrates this disparity in predominantly developing nations, showcasing a marked advantage in female education alongside a regrettably low LFPR among women. The predicament deepens in leadership roles: a mere 14.4 percent of Executive Officer positions at Fortune 500 companies were held by women in 2010<sup>1</sup> (Soares et al., 2010), and the average share of female-led firms in developing countries was merely 15 percent according to the World Bank Enterprise Survey (WBES). This striking scenario naturally drives one to ask two pivotal questions. First, why does a substantial gender gap persist in top leadership positions? Second, what are the implications for economic development and growth?

To answer the first question, existing literature attributes gender disparities in leadership to demand-side constraints like gender stereotypes and discrimination (Eagly and Karau, 2002; Carter and Peters, 2016; Goldin, 2014b) and glass ceilings (Matsa and Miller, 2011; Adams and Funk, 2012), and supply-side forces such as gender division of labor at home (Goldin, 2014a), women’s self selection into a few women prevalent industries due to weak rule of law (Ashraf et al., 2019), and noncognitive skills and psychological attributes (Blau and Kahn, 2017). Remarkably, few economic studies delve into the role of religion, a fundamental set of beliefs and practices influencing behaviors, in explaining this gender gap.

This paper seeks to address the gap by utilizing a worldwide sample of firms from the WBES to examine the impact of major religions on female underrepresentation in firm leadership. A cross-sectional analysis reveals intriguing associations: the proportion of female-led firms is positively correlated with the population share of Buddhists, negatively associated with the share of Muslims, and uncorrelated with the share of Christians. After accounting for rule of law, female-to-male post-secondary education attainment rate and LFPR, Buddhism maintains a positive impact on female firm representation, suggesting influences beyond traditional channels. A deeper investigation into Buddhism’s teachings reveals a potential connection between progressive gender roles, open-mindedness, and tolerance, which may counteract gender stereotypes and discriminatory norms that hinder women’s leadership.

Furthermore, using the World Values Survey (WVS), this paper explores the mechanisms through which Buddhism influences gender-related values. The results indicate that Buddhism is associated with higher generalized trust, lower desire for success, and greater support for gender equality. Higher generalized trust may reflect compassion and kindness, the core values of Buddhism. An experiment research on religion and trust in China also confirms that Buddhists have the highest trust and trustworthiness level and that they treat in and out-group participants equally (Xia et al., 2021). It will benefit women in the workplace if Buddhism helps cultivate a lower prejudice environment. On the other hand, Buddhism lowers the desire for success and the effect is stronger among men. This may help women take on leadership positions if men are less power-oriented. Though both Buddhism and Christianity are associated with higher support for gender equality, Buddhism’s effect has greater gender heterogeneity: it looks as if men’s and women’s opinions converge as the share of Buddhists increases. Figure 2 visualizes the patterns discussed above.

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<sup>1</sup>Women currently hold only 10.4 percent of CEO positions at Fortune 500 companies.

My first set of findings contributes to the discourse on the gender gap in leadership roles. Through a nuanced examination of the influence of religions, I reveal that Buddhism fosters an increase in female leadership by cultivating a culture characterized by reduced competitiveness, power dynamics, and prejudices. This influence appears to transcend conventional factors such as the rule of law, gender division of labor, or human capital. Moreover, my research adds a new dimension to the economics of religion by illustrating its potential impact on economic development through the gender lens. While previous studies in this domain have primarily focused on dimensions like work ethics (Weber, 1994), human capital (Becker and Woessmann, 2009), fertility decisions (Becker et al., 2010) and public goods provision (McCleary et al., 2003) to explore the intersection of religion and economic growth, my work introduces a fresh perspective by highlighting the gender-specific ramifications. This departure is crucial, considering the existing body of literature which underscores the inadequacy of education in explaining gender inequality and emphasizes the role of social norms (Dildar, 2015; Xiao and Asadullah, 2020). In alignment with these perspectives, my findings suggest that Islam correlates with lower female LFPR and that higher female LFPR is associated with increased female representation in top managerial positions. In addition, my findings suggest that studying the women’s side alone does not provide a comprehensive understanding. Notably, Buddhism is associated with higher LFPR regardless of gender, and its impact on the values of men emerges as a key explanatory factor behind the attenuated gender gap in leadership roles in countries with a higher prevalence of Buddhism.

To unravel the economic consequences of gender gaps in leadership, the paper investigates the relationship between female top managers and firm performance, a topic that has gained increasing attention since the 1990s with diverse and sometimes conflicting findings (Hoobler et al., 2018). While numerous studies document a positive link between female leadership and firm performance (Krishnan and Park, 2005; Dezső and Ross, 2012; Post and Byron, 2015; Christiansen et al., 2016; Flabbi et al., 2019; Ritter-Hayashi et al., 2019), others suggest underperformance in women-led firms compared to their male counterparts (Sabarwal and Terrell, 2008; Bruhn, 2009; Fang et al., 2022; Allison et al., 2023). This divergence is unsurprising given the vast demographic, cultural, and institutional variations across countries. Indeed, some papers find that the relationship between female leadership and firm performance changes with firm characteristics (Flabbi et al., 2019; Christiansen et al., 2016), local business environment (Allison et al., 2023), and national gender attitudes (Hoobler et al., 2018; Fang et al., 2022). In addition, Fernando et al. (2020) question the suitability of previously used accounting measures for performance because they are easily manipulated. Using data of public firms may also be problematic as market-based measures may capture both actual performance and future expectations. Using financial measures only may mask the underlying differences in terms of how men and women manage firms.

This paper addresses the above challenges using a worldwide representative sample of firms, which allows me to compare firms across locations within a country in the same industry and year with a rich set of controls including firm characteristics and local business environments. Moreover, echoing concerns raised by Fernando et al. (2020) regarding the suitability of conventional accounting measures for performance, this research investigates the impact of female top managers on two distinct sources of growth: intensive growth through innovation and extensive growth from quantitative increases in labor, capital, and land.

I find that women-led firms are significantly more innovative, evidenced by a higher likelihood of introducing new products or services and spending on research and development (R&D). Productivity results initially appear mixed, with female-led firms

demonstrating higher total factor productivity but lower sales per permanent worker, a proxy for labor productivity. A deeper dive into labor composition and costs reconciles this paradox, showing that female-led firms hire more female and skilled labor, provide extensive training, and employ fewer temporary workers, leading to higher labor costs relative to sales. Notably, the proxy fails to capture real labor productivity differences if men and women-led firms have disparate work hours. Given that women-led firms have a higher proportion of female workers, they likely have shorter work hours (Fairlie and Robb, 2009), supported by lower labor costs per worker among such firms. The investment in innovation, however, comes with trade-offs, as women-led firms are less likely to invest in real assets and have smaller sales and worker growth rates compared to their male counterparts.

Furthermore, I examine whether women-led firms are disproportionately more productive with higher religion shares. The results indicate that women-led firms are especially more productive with higher Buddhist share, but less productive with higher Christian share.

My findings contribute to the ongoing debate on gender and firm performance by examining the impact of female top managers on two distinct sources of firm growth. The results shed light on why previous findings are ambiguous and highlights a strategic choice faced by firms: the allocation of limited resources between innovation and scale expansion. If women business leaders prioritize intensive growth, they may have to sacrifice extensive growth. This insight adds depth to our understanding of the nuanced decisions that organizations led by women must make.

The rest of the paper is organized as follows. Section 2 describes the data and measurements. Section 3 presents the empirical results of religion's effect on the gender gap in firm leadership, followed by the results of religion's effects on people's values and beliefs. Section 4 presents the empirical results of gender and firm innovation and productivity. Results on other firm outcomes are described here too. Section 5 concludes and discusses the limitations.

## 2 Data and measurement

The main data source is the World Bank's Enterprise Surveys (WBES) in 759 subnational regions of 152 countries from 2006 to 2022 covering over 180,000 firms. Each country may be surveyed one to three times during the period. The WBES employs stratified random sampling method to collect data on a representative sample of firms from the business owners or top managers. In each country, the population of firms is provided by the national statistical office. The strata for WBES are business sector (manufacture, services, retail), geographical region within a country and firm size. Though surveys conducted before 2006 are also available, but the firms surveyed were not representative and different questionnaires were used across nations.

The data source for countries' religious compositions is the Pew Research Center's 2012 report on the size and distribution of the world's major religious groups as of 2010. The report covers more than 230 countries and territories. It collects data from about 2,500 sources, including censuses, demographic surveys, general population surveys and other studies, with censuses being the primary source (Hackett et al., 2012).

The data source for people's beliefs and views is the World Values Survey (WVS) covering 120 countries since 1981. The WVS conducts representative comparative social survey globally every 5 years on people's values, beliefs and norms. At the moment, WVS is the largest non-commercial cross-national empirical time-series investigation of human beliefs and values ever executed.

Sections 2.1 and 2.2 present a detailed discussion of the measurements of religion, gender, firm performance, and control variables.

## 2.1 Religion and female underrepresentation in leadership jobs

### 2.1.1 Religion measure: share of people identifying with a religion

The main independent variables when studying female leadership underrepresentation in this paper are the shares of people identifying with Buddhism, Christianity and Islam respectively. Table 1 reports the summary statistics of the variables.

### 2.1.2 Female underrepresentation measure: women-led firm share

Using data from the WBES, I calculated the fraction of firms with a female top manager for each country. If a country was surveyed more than once, I use the average share across years. Figure 3 shows the fraction by industry. Firms are more likely to have female top managers if they are in industries like retail, hospitality and tourism, pharmaceuticals and medical products, textiles and garments, and food. Figure 4 illustrates the world distribution of female firm share, with the highest in the East Asia and Pacific region and the lowest in the Middle East and North Africa region.

### 2.1.3 People's values and beliefs

To investigate the effect of religion on people's values and beliefs, I choose questions from the WVS on gender views, generalized trust, and attitudes towards what is important in life. Since my data on religious population is from 2010, I choose the survey year closest to 2010 for each country covered in the WVS as the sample. Table 2 reports the summary statistics of the main variables in the individual attitude analysis.

### 2.1.4 Controls

To isolate religion's impact on gender as best as possible, I control for the female to male education ratio and labor force participation ratio. I also control for rule of law, measured by the country's global ranking of governance, and female political representation, measured by the share of women in parliament. In robustness tests, I include income and development measures such as GDP per capita (in logs) and agricultural land share. These variables are sourced from World Development Indicators (WDI). Their summary statistics are reported in Table 1.

In the estimation of gender's effect on beliefs and values, I control for individual demographic characteristics such as age, income, marital status, education level and gender, and county level measures of income and development. The summary statistics of these control variables are reported in Table 2.

## 2.2 Female leadership and firm performance

### 2.2.1 Female leadership measure: FTM

The main independent variable in the analysis of firm outcomes, female top manager (FTM), is a dummy that equals one if the firm reports having a female top manager, and zero otherwise.

### 2.2.2 Dependent variables

**Innovation** I utilize the two questions from the WBES on firm innovation:

“During the last three years, has this establishment introduced new or significantly improved products or services?”

“During the last fiscal year, did this establishment spend on formal research and development activities, either in-house or contracted with other companies, excluding market research surveys?” As shown in Table 3, 35 percent of firms introduced a new product or service, and 25 of percent firms spent on R&D.

**Productivity** There are two revenue-based total factor productivity (TFPR) measures constructed by the WBES (Francis et al., 2020). One is based on value-added production functions and the other on gross-output production functions. One shortcoming of the TFPR measures is that they are only available for manufacturing firms. Labor productivity, measured by sales over number of permanent workers, is available for all firms. This measure suffers from measurement error because we do not have data on hours worked, and only captures labor efficiency.

**Labor composition and costs** The labor composition measures are the following: skilled labor share, temporary worker share and female worker share. The WBES also collects data on the total labor costs in the last fiscal year, and whether the firm provides formal training to workers. I use labor cost per worker (in logs) and labor cost over total sales (in logs) as measures for labor costs.

**Investment and growth** There are three important growth measures in the WBES: the sales growth rate, the employment growth rate, and the labor productivity (sales per worker) growth rate over the last three years (annualized). When estimating FTM’s impact on the growth measures, I control for the initial level of sales (Log[sales 3 years ago]) and size (Log[num. of employees 3 years ago]). The following question is used to measure firm investment behavior:

In the last fiscal year, did this establishment purchase any new or used fixed assets, such as machinery, vehicles, equipment, land or buildings?

Table 3 indicates that 42 percent of firms bought fixed assets, and the averages of sales, employment, and labor productivity growth rates are 17, 6 and 11 percent.

### 2.2.3 Control variables

Following prior literature that uses the WBES dataset, I control for the following firm characteristics: firm size (Log[num. of employees]), firm age (Log(Age)), top manager’s years of industry-specific experience (Log[Experience]), size dummies, age group dummies, an export status dummy (*Exporter*) and ownership type dummies. I also control for three local business environment measures: web access, credit access and electricity access. To construct the local business environment variables, I aggregate the firm level observations to city-year level. Web access is measured by the fraction of firms with a website, credit access is measured by the proportion of firms with a bank loan or line of credit, and electricity access is measured by the proportion of firms with no electricity outages last year. As I already include country fixed effects, I do not control for country characteristics<sup>2</sup>. The summary statistics are reported in Table 3.

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<sup>2</sup>To be specific, only country characteristics that do not change with time are captured by country FE. Given many countries are surveyed only once in the sample, I do not control for country characteristics that

### 3 How does religion affect the gender gap in business leadership?

In this section, I first present baseline results that show how three major religions, i.e., Buddhism, Islam and Christianity, are associated with the gender gap across countries in Section 3.1, then I test the following channels in Section 3.2: human capital, labor force participation, rule of law and female participation in politics. I show that Islam’s negative effect on women in leadership is mainly driven by the gender division of labor and human capital channels, whereas the positive linkage of Buddhism and female business leadership remains partially unexplained. Christianity is not significantly associated with female top leadership share in my study<sup>3</sup>. The results that show the impact of Buddhism (and the other two religions, for comparison purposes) on people’s values and beliefs are presented in Section 3.3.

#### 3.1 Baseline results

I use the following model specification to estimate religion’s effect on female firm share.

$$FemaleFirmShare_i = \beta_0 + \beta_1 ReligionShare_i + CountryControls_i\Theta + \varepsilon_i \quad (1)$$

where  $i$  denotes a country, and *ReligionShare* denotes one of the following: *BuddhistShare*, *MuslimShare* and *ChristianShare*. The country controls include GDP per Capita, agriculture land share, political stability, labor force participation rate, and share of women in parliament. To avoid the bad control problem, I do not include any country controls in the baseline results reported in Columns (1), (4), and (7), Table 4. I then include them in the estimation and the results are shown in Columns (2), (5) and (8). I further include region dummies in the specification to account for regional heterogeneity in religious composition. The results are shown in Column (3), (6) and (9).

The baseline results show that Buddhist share is strongly associated with female firm share. A 10 percent increase in Buddhist share would increase the fraction of female top manager by 2.8 percent. The mean female firm share across countries is only 15 percent, so the change would be substantial. The coefficient does not change much with country controls or region fixed effects. Results in columns (4) to (6) are on Islam, which is consistently negatively associated with female firm share, but the coefficients are smaller compared to Buddhism: a 10 percent increase in Muslim share would decrease female top manager share by about 1 percent. Columns (7) to (9) presents the results of Christianity, in which the point estimates are small and noisy.

Results of other religions are reported in Table 5, in which the estimates are not stable to country controls or region fixed effects.

#### 3.2 Mechanisms: education, labor participation, rule of law and favorable regulation

In light of previous literature on this topic (Eagly and Karau, 2002; Goldin, 2014a; Blau and Kahn, 2017; Ashraf et al., 2019; Dildar, 2015), I consider the following five

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do change with time in the main analysis.

<sup>3</sup>The WBES includes European countries like Italy and Spain that have high Christian share but no countries in North America. These European countries have moderate female firm shares despite higher income, education and female labor force participation.

important channels through which religions could affect women’s presence in business leadership: the gender gap in education, the gender gap in labor force participation, rule of law, regulation that favors women in leadership, and the cultural channel through gender stereotypes, patriarchal norms and discrimination.

I measure the gender gap in education and labor force participation by the ratio of female to male post-secondary education enrollment rate ( $F2Medu$ ) and the ratio of female to male labor force participation rate ( $F2MLFPR$ ). Rule of law is proxied by the ranking of governance (*Governance*), and the favorably regulation is proxied by the share of women in parliament (*PolShare*).

To test the first four channels, I first check whether the share of Buddhists and Muslim are associated with the above measures. The results are reported in Table 6. I then use them as controls adding to the baseline specification. The results are shown in Table 7.

The estimates in Table 6 suggest that Buddhism’s impact on female business leadership needs explanations other than the channels examined in this section. The only statistically significant result is from the channel of favorable regulation, but the sign is negative, which means that there would be less women-friendly regulations with higher Buddhist share. The second half of Table 6 presents results of Muslim share. We see a strong negative association of Muslim share with the gender gap in human capital and labor participation.

It is then unsurprising to see Buddhist’s effect persists, and Muslim’s effect vanishes once we control for the conventional channels as shown in Table 7. Christian’s results are also reported as robustness checks.

### 3.3 Religion’s effect on values and beliefs

In this section, I test the cultural channel through which Buddhism affets female business leadership. Specifically, I use data from the WVS to estimate religion’s impact on one’s gender views, patriarchal norms, discrimination, and work-related beliefs. I use the following model specification that includes an interaction term with respondent’s gender to estimate gender specific effects of religions on beliefs.

$$Belief_{icr} = \beta_0 + \beta_1 R_c + \beta_2 Sex_{icr} + \beta_3 Sex_{icr} \times R_c + X_{icr} \Gamma + D_c \Theta + \mu_r + \varepsilon_{icr} \quad (2)$$

where  $i$  denotes individual,  $c$  denotes country and  $r$  denotes region.  $R_c$  represents share of a religion, and  $Sex_{icr}$  is a dummy that equals to one if the respondent is female.  $X_{icr}$  denotes demographic characteristics that may affect one’s values, including age, marital status, education and income level.  $D_c$  represents country level controls, and  $\mu_r$  captures region fixed effects.

The results for Buddhist, Muslim and Christian are reported in Tables 8, 9 and 10, respectively. I find that both Buddhism and Christianity are associated with higher support for gender equality. However, Buddhism’s effects display greater gender heterogeneity; it increases men’s support for gender equity more than women’s.

Another observation is that among Christianity, Islam and Buddhism, only Buddhism is positively associated with generalized trust and negatively associated with the desire for success. While Buddhism lowers the desire for success, the effect is stronger among men. This may help women take on leadership positions if men are less power-oriented.

Higher generalized trust may reflect compassion and kindness, the core value of Buddhism. It could benefit women in the workplace in two ways. First, women face less gender-based discrimination in the workplace if Buddhism helps cultivating a lower



prejudice environment. Second, a high-trust environment reduces transactional costs, especially for socially disadvantaged groups like female entrepreneurs.

The results discussed above suggest that Buddhism mainly increase female share in business leadership through a less prejudice and patriarchal culture. And its greater impact on values of men might be the key to explaining why the gender gap in leadership is smaller in countries with higher Buddhist share.

## 4 Gender and firm growth

In this section, I examine the impact of female top manager (FTM) on firm’s intensive growth measures, namely innovation and productivity and firm’s extensive growth measures, namely employment and fixed assets growth. Intensive growth is important to maintain economic growth in the long term, especially on a per-capita basis. Extensive growth can also help firm succeed by utilizing the economic of scale or a greater market power. Furthermore, I examine how the gender difference in productivity changes with religions share in Section 4.5.

I use the following specification to estimate FTM’s effect on firm growth and other outcomes.

$$Perf_{iscjt} = \beta_0 + \beta_1 FTM_{iscjt} + X_{iscjt}\Theta + E_{sct}\Gamma + u_j + v_c + \tau_t + \epsilon_{iscjt} \quad (3)$$

where  $i$  denotes firm,  $s$  denotes province or state,  $c$  denotes country,  $j$  denotes industry, and  $t$  denotes year. Industry, country, and year fixed effects are captured by  $u_j$ ,  $v_c$  and  $\tau_t$ .  $Perf_{iscjt}$  denotes the outcomes of interest.  $X_{iscjt}$  denotes firm level controls such as firm size, age, ownership type, and  $E_{sct}$  are local business environment controls at the province-year level.

### 4.1 Intensive growth

The baseline results for intensive growth measures are reported in Table 11. The results show that women-led firms are significantly more innovative: they are more likely to have new products or services and spend on R&D. When it comes to productivity, the results are mixed: female-led firms have higher total factor productivity and lower labor productivity.

One possible explanation for the mixed results is that the effect of FTM differs with business sector. Female manufacturing firms may be more productive, and female services firms less productive compared to men-led firms. The TFP advantage captures FTM’s positive effect on manufacturing firms, and the lower labor productivity reflects lower productivity among women-led services firms.

Another explanation may have something to do with the measurement error of labor productivity in the data. The WBES data does not include hours worked, so labor productivity is proxied by sales divided by the number of permanent workers. If hours worked are substantially lower for women-led firms, the labor productivity of women-led firms would be biased downwards. I examine whether such bias exists in Section 4.2 by investigating labor composition and labor costs per worker. We should see lower labor costs per worker for women-led firms if their workers have fewer hours worked. Labor composition also matters because hours worked differ for men and women workers, and the use of temporary workers would bias the productivity measure upwards.

## 4.2 Labor composition and costs

The effects of FTM on labor composition and costs are reported in Table 12. It shows that Women-led firms hire more female workers and less temporary workers, and have smaller labor cost per worker. These results suggest that their true labor productivity should be higher than the estimation in Table 11. I calculate an adjusted labor productivity to account for these differences and compare the density functions by gender of top managers in Figure 5. The pattern confirms that the actual labor productivity should be higher for women-led firms. It also shows that FTMs have a more dispersed labor productivity distribution despite a lower average. Estimating FTM's effect on labor productivity using the adjusted measure results in a much smaller gap.

Moreover, I find that FTMs hire more skilled labor and provide more training, which can help explain why their firms have higher innovation and TFP.

## 4.3 Extensive growth

My previous findings suggest that women-led firms are more innovative and have higher productivity. Is it because female leaders are just better at operating firms, or that they prefer intensive growth over extensive growth? In this section I show that the latter narrative is more feasible by studying FTM's impact on investment, sales and employment growth.

As shown in Table 13, FTM is negatively associated with the measures of extensive growth, and it is not because FTM has trouble accessing the needed resources. Columns (4) and (5) of Table 13 show that FTM has no impact on access to finance and land.

To summarize, the results presented here suggest that female top managers prefer intensive growth over extensive growth, and have employees work fewer hours than male top managers. Such preference is reflected in FTM's higher innovation and TFP, lower sales per worker, and lower growth rates for employment and fixed assets. It is hard to conclude which model is better, because both intensive and extensive growth help a firm to survive and grow. The innovation and TFP advantage makes FTMs more competitive in a niche market, but they could lose efficiency from the economies of scale.

## 4.4 Robustness checks

To account for country level variables that change with time, I further include country dummies  $\times$  year trend to the baseline specification as a robustness check and report the results in Table 14, 16 and 18. The results are very similar to baselines results.

My current measures of local business environment may fail to capture omitted variables that both affect firm growth and the gender of managers. To eliminate such problem, I include province fixed effects instead of country fixed effects and reports the estimates in Table 15, 17 and 19. The results are also highly consistent.

## 4.5 Do women-led firms have greater productivity advantages with higher religions share?

I use the following specification to estimate religion's effect on the gender difference in firm productivity.

$$P_{iscrjt} = \beta_0 + \beta_1 FTM_{iscrjt} + \beta_2 R_c + \beta_3 FTM_{iscrjt} \times R_c + X_{iscrjt} \Theta + E_{scrt} \Gamma + D_{crt} \Delta + u_j + v_r + \tau_t + \epsilon_{iscrjt} \quad (4)$$

where  $i$  denotes firm,  $s$  denotes province,  $c$  denotes country,  $r$  denotes region,  $j$  denotes industry and  $t$  denotes year.  $FTM$  is the female top manager dummy, and  $R$  is a religion's share.  $X$  represents firm level controls,  $E$  denotes local business environment controls, and  $D$  stands for country level controls.  $u_j$ ,  $v_r$  and  $\tau_t$  denotes industry, region and year fixed effects. The main outcome variables of interest are total factor productivity and labor productivity<sup>4</sup>. I also examine the effects on firm's propensity to innovate (R&D and new product or service).

The estimates for Buddhist, Muslim and Christian are reported in Table 20, 21 and 22, respectively. The results indicate that women-led firms are disproportionately more productive with higher Buddhist share, and less productive with higher Christian share. I also find that men-led firms become less innovative with high Muslim share but not women-led firms.

## 5 Conclusions and limitations

This study interrogates two important facets of firm development, the substantial gender gap in business leadership and the impact of female business leaders on firm performance, both wielding profound socio-economic and political implications.

To begin with, unveiling the largely overlooked relationship between religion and gender in business, this research illuminates Buddhism's robust positive effect on female firm share. This effect persists under various controls, dissociating from conventional factors like the gender gap in human capital, labor participation, and rule of law. It is also not likely that it works through regulation that favors women in leadership because if that is the case, Buddhist share would positively correlate with the share of women in politics, opposite to what I find in the data.

I test the cultural channel using the WVS data and the results are highly supportive. Though both Buddhism and Christianity are correlated with more equal gender views, Buddhism's effects display greater gender heterogeneity and are stronger among men. Among the three major religions, only Buddhism is positively associated with general trust, suggesting that it increases the level of tolerance and decreases identity-based prejudice, including gender discrimination. In terms of attitudes towards work and success, all religions are associated with higher importance of work, but only Buddhism is associated with lower importance of success, and the effect is greater among men. This suggests that Buddhism is associated with less patriarchal norms, and men in high Buddhist share countries are less power-driven. These findings underscore culture's pivotal role in determining firm leadership, supplementing strides in female education, labor, politics and rule of law.

The subsequent inquiry explores the impact of female top managers (FTM) on firm performance across intensive and extensive growth margins. FTMs exhibit higher innovation and total factor productivity but seemingly lower labor productivity when measured by sales per permanent worker. A deeper dive into labor composition reveals potential higher labor productivity if measured accurately by sales over hours worked. Furthermore, FTM-led firms demonstrate lower employment growth and fixed assets investment, despite similar access to finance and land, suggesting fundamentally different preferences for intensive vs. extensive growth for male and female top managers. Female managers tend to put resources into developing novel products and services, and spend on R&D, while male managers tend to spend on the expansion of scale. Furthermore, I show that FTM's productivity advantage increases with share of Buddhist,

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<sup>4</sup>In this section, I use the adjusted sales per worker to proxy for labor productivity as it is a more accurate measure compared to sales per permanent worker

and decreases with share of Christian.

These results challenge prevailing notions on gender and firm performance, portraying nuanced managerial styles. Female managers prioritize innovation and interpersonal aspects, while male managers excel in efficiency-driven decisions and expansive resource allocation. Considering the significance of both intensive and extensive growth, neither approach singularly dictates firm success. In the developing world where piracy is rampant, the return on innovation may be limited, which may help explain why there are so few FTMs.

Collectively, these findings underscore the impediments posed by prevailing gender dynamics in firm leadership, particularly hindering economic growth in developing countries transitioning from extensive to intensive growth paradigms. To promote women as business leaders, efforts must break conventional gender roles, diminish workplace prejudices, and mitigate attitudinal disparities in aspirations for power and success.

Acknowledging limitations, this study urges nuanced exploration beyond religious affiliation, longitudinal analyses, and comprehensive demographic insights into managerial performances and corporate cultures. Anticipating future longitudinal and expansive datasets, deeper causal inferences and a more nuanced understanding of diverse business environments can be drawn.

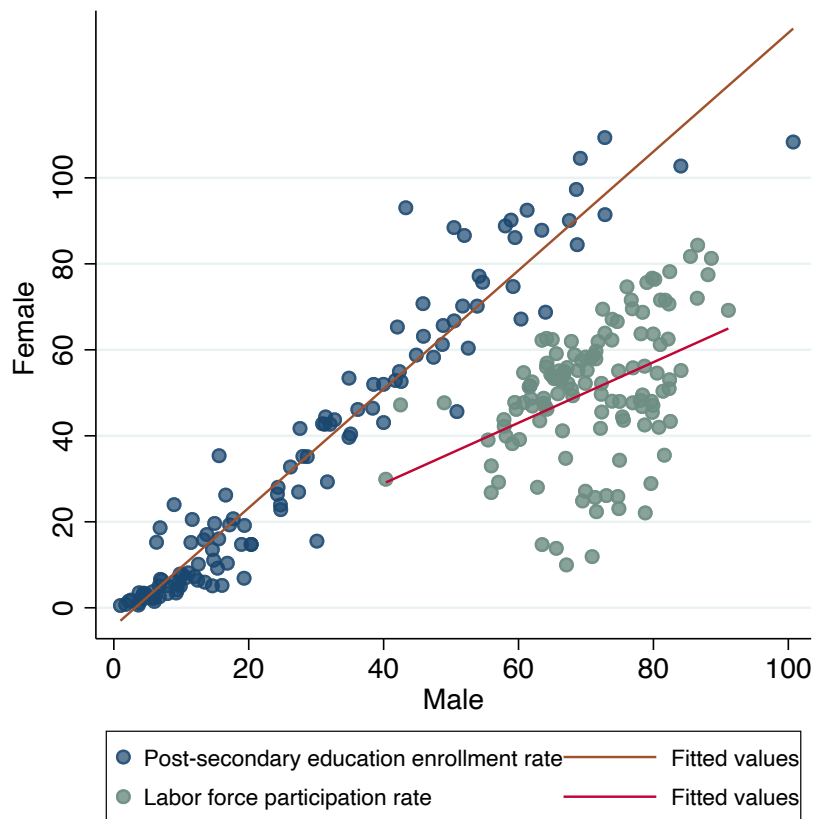
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## A Figures

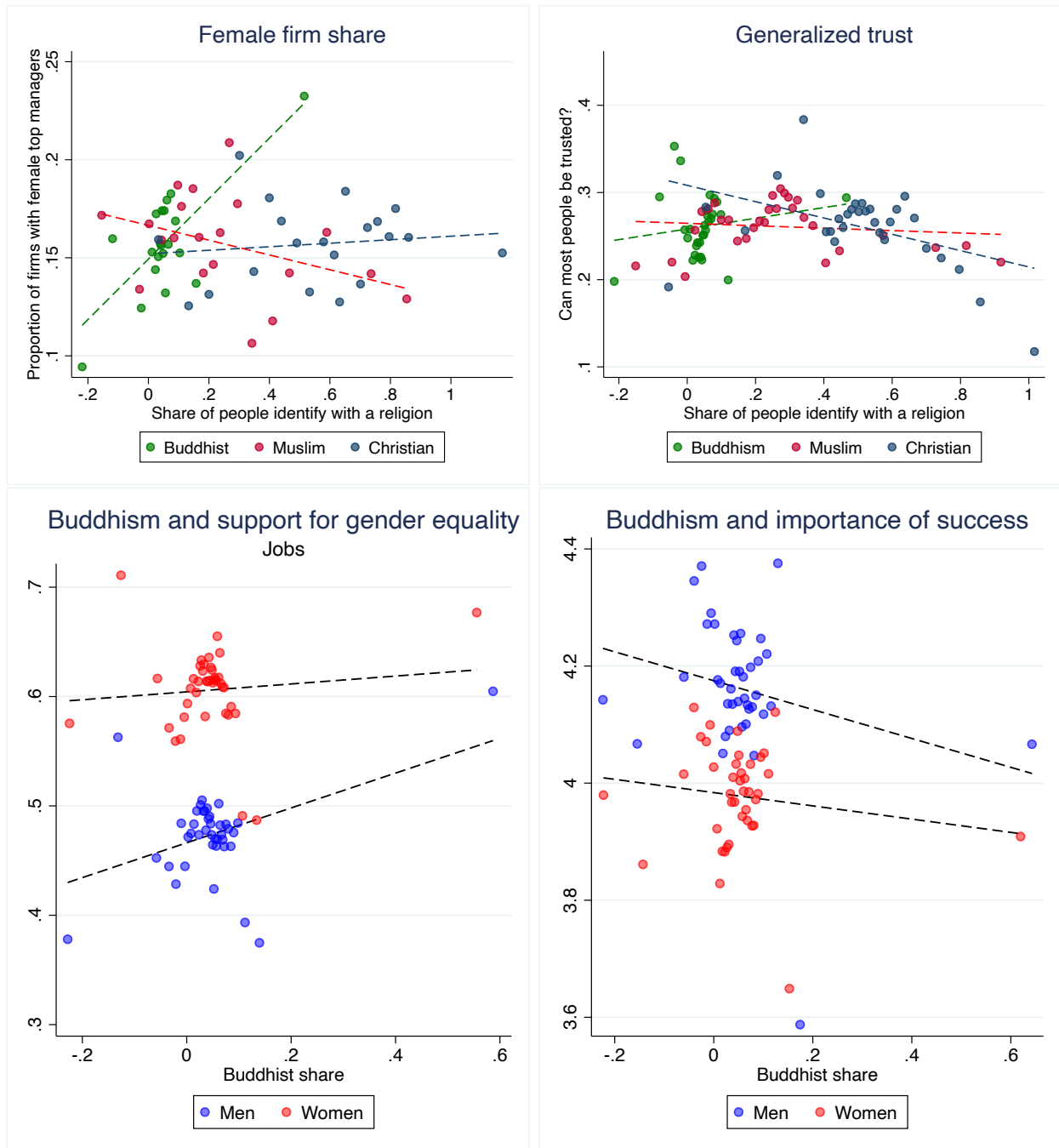
Figure 1: Female vs. male labor participation and education



Note: Figure shows the distribution of female and male (LFPR) and post-secondary education enrollment rates across countries in 2010.

Source: World Development Indicators, the World Bank.

Figure 2: Religion, attitudes and female firm share



Note: Figure shows the binscatter plots of religions and the fraction of female-led firms in a country (upper left), generalized trust (upper right), support for gender equality in jobs (lower left) and desire for success (lower right) of an individual surveyed in WVS . All plots have controlled for covariates and region fixed effects.



Figure 3: Female firm share by industry, top 15

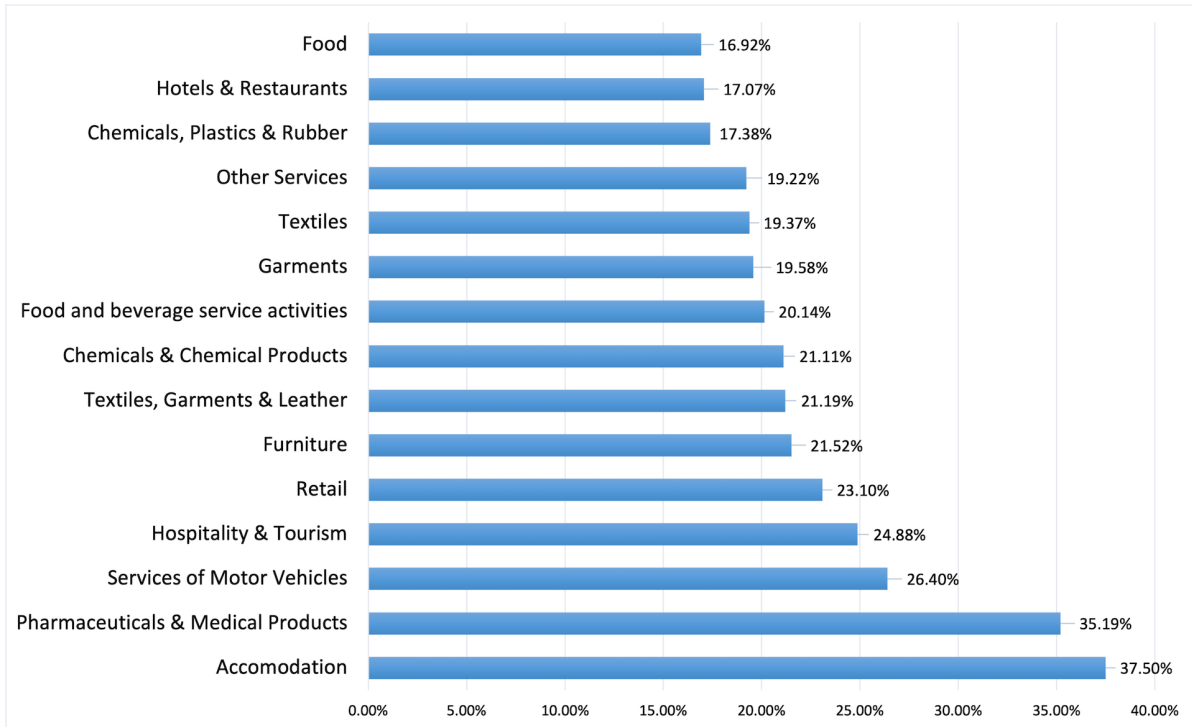


Figure 4: Female firm share by country

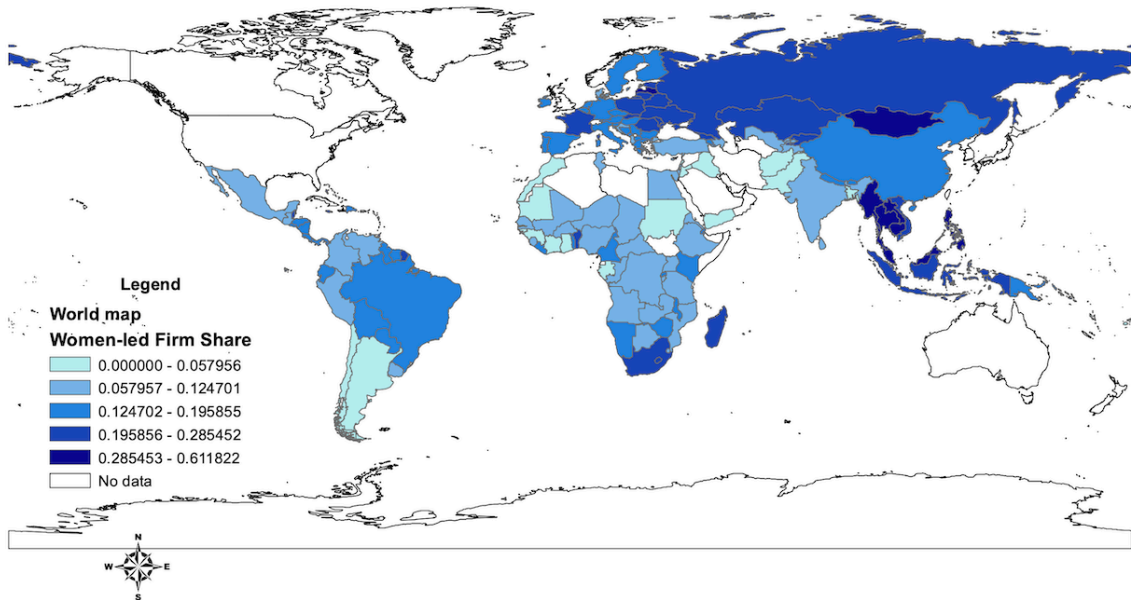
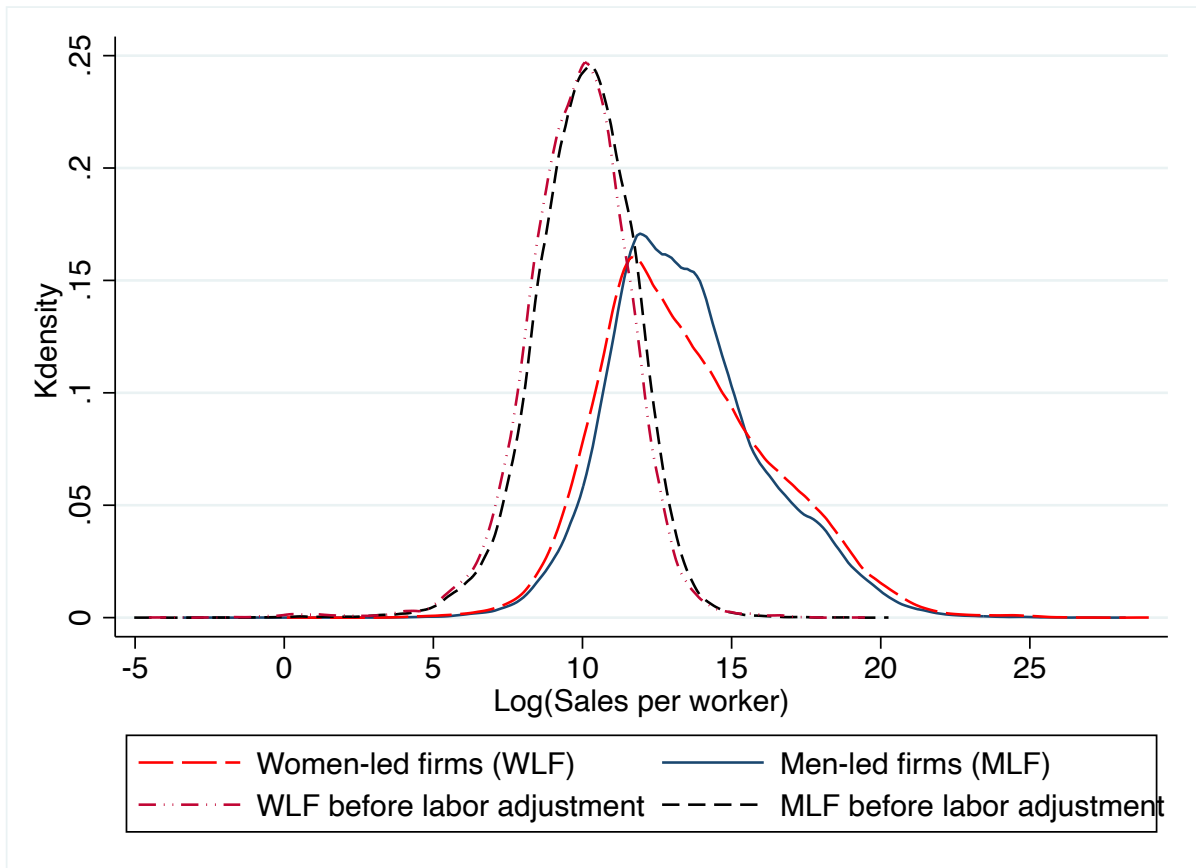


Figure 5: Labor Productivity Distribution by Gender of Top Manager



Note: Figure shows the kdensity plots of sales per worker (in logs) before and after labor composition adjustments allowing for differing hours worked for men and women workers, as well as accounting for the use of temporary workers. After these adjustments, labor productivity of women-led firms are more dispersed despite a lower average compared to men-led firms.

## B Tables

Table 1: Summary Statistics, Cross-country Analysis on Female Firm Share

	N	Mean	S.D	Min.	Max.
Dependent_var					
Fraction of firms with female top manager	152	0.15	0.09	0.00	0.61
Independent_var					
Buddhist share	151	0.04	0.17	0.00	0.97
Muslim share	151	0.23	0.35	0.00	1.00
Christian share	151	0.59	0.37	0.00	1.00
Female to male post-secondary education ratio	120	1.07	0.48	0.18	2.71
Female to male labor force participation ratio	128	0.72	0.20	0.15	1.11
Post-secondary education enrollment rate, female	125	35.87	31.74	0.53	109.37
Post secondary education enrollment rate, male	122	28.88	21.97	0.98	100.72
Labor force participation rate, female	130	51.15	15.41	9.97	84.33
Labor force participation rate, male	126	70.98	9.17	40.32	91.11
Governance	152	0.44	0.26	0.01	1.00
Log[GDP per capita]	151	1.65	1.28	-1.02	4.94
Agriculture land share	147	0.41	0.20	0.01	0.83
Political stability	152	0.43	0.25	0.01	0.96
Labor force participation rate	143	0.63	0.10	0.38	0.86
Share of women in parliament	141	0.29	0.11	0.03	0.61

Table 2: Summary Statistics, Religion and Values

	N	Mean	S.D	Min.	Max.
Religion					
Buddhist share	157936	0.05	0.16	0.00	0.93
Muslim share	157936	0.27	0.38	0.00	1.00
Christian share	157936	0.49	0.38	0.00	0.99
Gender_views					
Gender role: man makes better business executives	133906	0.43	0.49	0.00	1.00
Gender role: man makes better political leaders	153604	0.48	0.50	0.00	1.00
Gender role: men have more right to a job	129216	0.47	0.50	0.00	1.00
Gender role: men should have more income at home	70013	0.46	0.50	0.00	1.00
Gender equality: job	157763	0.53	0.44	0.00	1.00
Gender equality: politics	153604	0.49	0.33	0.00	1.00
Gender equality: education	156137	0.65	0.31	0.00	1.00
Generalized_trust					
Most people can be trusted	156763	0.25	0.43	0.00	1.00
Importance_in_life					
Work is important in life	157940	0.90	0.30	0.00	1.00
It is important to this person being very successful	117745	4.04	1.46	1.00	6.00
Family is important in life	159929	0.99	0.11	0.00	1.00
Individual_characteristics					
Respondent sex: F	161484	0.52	0.50	0.00	1.00
Age	160983	41.41	16.41	15.00	102.00
Marital status	161236	0.63	0.48	0.00	1.00
Education level catagory	133233	4.83	2.19	1.00	8.00
Subjective income level (in 3 groups)	152327	1.83	0.61	1.00	3.00
Country_controls					
Log[GDP per capita]	158988	9.43	1.02	6.92	11.87
Agriculture land share	156913	0.42	0.21	0.01	0.83
Political stability	159991	42.58	26.97	0.47	97.16
Labor force participation rate	156933	0.61	0.10	0.38	0.87
Share of women in parliament	154638	0.19	0.11	0.00	0.56

Table 3: Summary Statistics, Gender and Firm Outcomes

	N	Mean	S.D	Min.	Max.
Innovation					
Firm introduced a new product/service	138304	0.35	0.48	0.00	1.00
Firm spent on research and development	74555	0.25	0.43	0.00	1.00
Productivity					
TFPR based on VAKL model	58144	1.11	1.58	-6.49	7.99
TFPR based on VKLM model	58144	2.00	1.97	-5.34	12.40
Log[sales per worker (in USD 2009)]	155425	9.99	1.68	-5.03	20.26
Labor					
Share of skilled workers	90270	0.72	0.30	0.00	1.00
Female worker share	165286	0.30	0.29	0.00	1.00
Share of temporary workers	178615	0.13	0.33	0.00	12.00
Firm offers formal training	167064	0.36	0.48	0.00	1.00
Log[labor cost per worker]	152842	8.03	1.57	-9.10	16.32
Log[labor cost per unit of sales]	145181	0.19	0.18	0.00	7.37
Growth					
Annual employment growth rate	168096	0.06	0.17	-0.38	1.01
Annual sales growth rate	142249	0.17	0.51	-0.62	6.25
Investment					
Firm bought fixed assets last fiscal year	187285	0.42	0.49	0.00	1.00
Access to finance	176724	0.15	0.35	0.00	1.00
Access to land	176724	0.03	0.17	0.00	1.00
Independent_var					
Female top manager	162078	0.15	0.36	0.00	1.00
Firm_characteristics					
Log[number of workers]	187866	3.39	1.33	0.00	14.33
Log[firm age (Years)]	185772	2.76	0.74	0.00	5.40
Foreign ownership over 10 percent	186182	0.10	0.30	0.00	1.00
Exporter	186866	0.16	0.36	0.00	1.00
Sole proprietorship	189153	0.33	0.47	0.00	1.00
Small size (<20)	189153	0.46	0.50	0.00	1.00
Medium size (20-99)	189153	0.34	0.47	0.00	1.00
Log[top manager's experience (Years)]	184110	2.75	0.69	0.00	4.11
Business_environment					
Web access	189153	0.46	0.24	0.00	1.00
Credit access	189153	0.30	0.21	0.00	1.00
Electricity access	189153	0.30	0.22	0.00	1.00

Table 4: Female Firm Share and Buddhist, Muslim and Christian

	Dep.var: % firms with female top manager								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Buddhist share	0.280*** (0.070)	0.293*** (0.068)	0.260*** (0.064)						
Muslim share				-0.099*** (0.017)	-0.076*** (0.027)	-0.068*** (0.021)			
Christian share							0.027 (0.026)	-0.017 (0.029)	-0.005 (0.025)
Country Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Region FE	No	No	Yes	No	No	Yes	No	No	Yes
Observations	151	138	138	151	138	138	151	138	138
Adjusted $R^2$	0.24	0.36	0.51	0.13	0.12	0.39	0.00	0.07	0.35

Note: This table examines the impact of religions on the share of female firms. Columns (1)-(3) show results of Buddhism, Columns (4)-(6) show results of Islam, and Column (7)-(9) show results of Christianity. Some specifications include GDP per capita (in logs), agricultural land share, political stability, labor force participation and the share of women in parliament as controls. Robust standard errors are in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 5: Female Firm Share and Hindu, Jewish and Unaffiliated

	Dep.var: % firms with female top manager								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Hindu share	-0.089*	-0.077	-0.028						
	(0.051)	(0.047)	(0.064)						
Jewish share				-0.059***	-0.116**	0.019			
				(0.011)	(0.056)	(0.051)			
Unaffiliated share							0.138**	0.078	0.028
							(0.059)	(0.069)	(0.067)
Country Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Region FE	No	No	Yes	No	No	Yes	No	No	Yes
Observations	151	138	138	151	138	138	151	138	138
Adjusted $R^2$	0.00	0.08	0.35	-0.01	0.07	0.35	0.03	0.08	0.35

Note: This table examines the impact of religions on the share of female firms. Columns (1)-(3) show results of Hindu, Columns (4)-(6) show results of Jewish, and Column (7)-(9) show results of unaffiliated. Some specifications include GDP per capita (in logs), agricultural land share, political stability, labor force participation and the share of women in parliament as controls. Robust standard errors are in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 6: Buddhist share, Muslim share and the Drivers for the Gender Gap

	Buddhism				Muslim			
	(1) F2M edu	(2) F2M LFPR	(3) Governance	(4) Pol_share	(5) F2M edu	(6) F2M LFPR	(7) Governance	(8) Pol_share
Buddhist share	0.009 (0.213)	-0.023 (0.062)	-0.075 (0.080)	-0.139*** (0.034)				
Muslim share					-0.366*** (0.089)	-0.160** (0.062)	-0.018 (0.047)	-0.023 (0.030)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	115	125	143	139	115	125	143	139
Adjusted $R^2$	0.42	0.42	0.62	0.12	0.48	0.47	0.62	0.08

Note: This table examines the impact of religions on various outcomes that may affect female firm share. Country level controls include GDP per capita (in logs), urban population share and labor force participation rate. Columns (1)-(4) show results of Buddhism, Columns (5)-(8) show results of Islam. Robust standard errors are in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .



Table 7: Religions and Female Firm Share, Examination of Channels

	Dep.var: % firms with female top manager								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Buddhist share	0.280*** (0.070)	0.253*** (0.077)	0.158** (0.068)						
Muslim share				-0.099*** (0.017)	-0.037 (0.028)	-0.034 (0.022)			
Christian share							0.027 (0.026)	-0.045 (0.032)	0.008 (0.022)
F2M Education		0.103*** (0.021)	0.084*** (0.022)		0.103*** (0.024)	0.083*** (0.020)		0.127*** (0.025)	0.089*** (0.020)
F2M LFPR		0.176*** (0.037)	0.144*** (0.044)		0.190*** (0.053)	0.151*** (0.047)		0.255*** (0.056)	0.182*** (0.041)
Governance		-0.074*** (0.028)	-0.065** (0.028)		-0.088*** (0.032)	-0.074*** (0.027)		-0.084*** (0.031)	-0.062** (0.029)
Share of women in parliament		0.040 (0.075)	-0.011 (0.061)		-0.101 (0.100)	-0.060 (0.068)		-0.068 (0.088)	-0.064 (0.067)
Region FE	No	No	Yes	No	No	Yes	No	No	Yes
Observations	151	100	100	151	100	100	151	100	100
Adjusted $R^2$	0.24	0.50	0.65	0.13	0.29	0.61	0.00	0.30	0.60

Note: This table examines the impact of religions on the share of female firms. Columns (1)-(3) show results of Buddhism, Columns (4)-(6) show results of Islam, and Column (7)-(9) show results of Christianity. Some specifications include female to male education ratio, labor force participation ratio, quality of governance, and the share of women in parliament as controls. Robust standard errors are in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 8: Buddhism and Views: Gender, Trust and Important Things in Life

	Dep.var: Agree with gender norms				Support for gender equality			Generalized	Importance in life		
	(1) Business	(2) Politics	(3) Job	(4) Income	(5) Job	(6) Politics	(7) Education	(8) Trust	(9) Work	(10) Success	(11) Family
Buddhist share	-0.052*** (0.016)	-0.109*** (0.016)	-0.188*** (0.019)	-0.125*** (0.026)	0.162*** (0.014)	0.108*** (0.009)	0.059*** (0.009)	0.077*** (0.016)	0.018** (0.009)	-0.202*** (0.042)	-0.003 (0.003)
Respondent sex: F	-0.150*** (0.003)	-0.129*** (0.003)	-0.140*** (0.003)	-0.039*** (0.004)	0.124*** (0.002)	0.095*** (0.002)	0.081*** (0.002)	-0.008*** (0.003)	-0.033*** (0.002)	-0.157*** (0.009)	0.006*** (0.001)
F. × Buddhist share	0.100*** (0.019)	0.076*** (0.019)	0.077*** (0.023)	0.095*** (0.033)	-0.097*** (0.016)	-0.081*** (0.011)	-0.082*** (0.010)	-0.030 (0.019)	0.015 (0.011)	0.088* (0.049)	-0.004 (0.004)
Individual Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	100715	115596	96416	52269	118445	115596	117416	117535	118361	101241	119690
Adjusted $R^2$	0.15	0.15	0.20	0.08	0.17	0.17	0.08	0.08	0.07	0.10	0.01

Note: This table examines the impact of Buddhism on people's views on gender norms, generalized trust and what is important in life using data from the World Value Survey. The differential effects of Buddhism on men and women are captured by the interaction term. All specifications include individual and country level controls, and region dummies. Robust standard errors are in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 9: Islam and Views: Gender, Trust and Important Things in Life

	Dep.var: Agree with gender norms				Support for gender equality			Generalized	Importance in life		
	(1) Business	(2) Politics	(3) Job	(4) Income	(5) Job	(6) Politics	(7) Education	(8) Trust	(9) Work	(10) Success	(11) Family
Muslim share	0.239*** (0.007)	0.176*** (0.007)	0.307*** (0.007)	0.304*** (0.011)	-0.263*** (0.006)	-0.132*** (0.004)	-0.111*** (0.005)	-0.008 (0.006)	0.046*** (0.004)	0.129*** (0.021)	0.016*** (0.001)
Respondent sex: F	-0.125*** (0.004)	-0.116*** (0.003)	-0.125*** (0.004)	-0.006 (0.005)	0.109*** (0.003)	0.083*** (0.002)	0.062*** (0.002)	-0.005* (0.003)	-0.010*** (0.002)	-0.156*** (0.011)	0.007*** (0.001)
F. × Muslim share	-0.067*** (0.008)	-0.035*** (0.007)	-0.036*** (0.007)	-0.114*** (0.012)	0.038*** (0.006)	0.030*** (0.005)	0.056*** (0.005)	-0.014** (0.007)	-0.084*** (0.004)	0.013 (0.023)	-0.005*** (0.001)
Individual Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	100715	115596	96416	52269	118445	115596	117416	117535	118361	101241	119690
Adjusted $R^2$	0.16	0.15	0.22	0.10	0.19	0.18	0.09	0.08	0.07	0.10	0.01

Note: This table examines the impact of Muslim on people's views on gender norms, generalized trust and what is important in life using data from the World Value Survey. The differential effects of Buddhism on men and women are captured by the interaction term. All specifications include individual and country level controls, and region dummies. Robust standard errors are in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 10: Christianity and Views: Gender, Trust and Important Things in Life

	Dep.var: Agree with gender norms				Support for gender equality			Generalized	Importance in life		
	(1) Business	(2) Politics	(3) Job	(4) Income	(5) Job	(6) Politics	(7) Education	(8) Trust	(9) Work	(10) Success	(11) Family
Christian share	-0.210*** (0.008)	-0.150*** (0.007)	-0.235*** (0.008)	-0.293*** (0.011)	0.192*** (0.007)	0.098*** (0.005)	0.085*** (0.005)	-0.113*** (0.006)	-0.001 (0.004)	0.096*** (0.022)	-0.006*** (0.002)
Respondent sex: F	-0.152*** (0.005)	-0.126*** (0.005)	-0.143*** (0.005)	-0.087*** (0.008)	0.123*** (0.004)	0.088*** (0.003)	0.086*** (0.003)	-0.015*** (0.004)	-0.068*** (0.003)	-0.158*** (0.014)	0.004*** (0.001)
F. × Christian share	0.018** (0.008)	0.002 (0.007)	0.016** (0.008)	0.103*** (0.012)	-0.007 (0.006)	0.006 (0.005)	-0.018*** (0.005)	0.012* (0.007)	0.071*** (0.004)	0.009 (0.023)	0.004*** (0.001)
Individual Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	100715	115596	96416	52269	118445	115596	117416	117535	118361	101241	119690
Adjusted $R^2$	0.15	0.15	0.21	0.10	0.18	0.18	0.08	0.08	0.07	0.10	0.01

Note: This table examines the impact of Christian on people's views on gender norms, generalized trust and what is important in life using data from the World Value Survey. The differential effects of Buddhism on men and women are captured by the interaction term. All specifications include individual and country level controls, and region dummies. Robust standard errors are in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 11: Innovation, Productivity and FTM

	Innovation		Productivity		
	(1) New product	(2) R& D	(3) TFPR(VAKL)	(4) TFPR(VKLM)	(5) Labor productivity
FTM	0.018*** (0.004)	0.019*** (0.006)	0.075*** (0.023)	0.026 (0.026)	-0.131*** (0.014)
Firm Controls	Yes	Yes	Yes	Yes	Yes
Busi. Env. Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Observations	123606	66624	46515	46515	128001
Adjusted $R^2$	0.20	0.19	0.31	0.29	0.42

Note: This table examines the performance differences between women and men led firms. All specifications include industry, country and year fixed effects, firm characteristics, and local business environment. Robust standard errors (in parentheses) are clustered at province\*sector\*size level. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 12: Labor Composition, Costs and FTM

	Labor composition			Training	Labor costs	
	(1) SkillShare	(2) FemaleShare	(3) Temp. share	(4) Formal training	(5) Cost per labor	(6) Labor cost per sale
FTM	0.011** (0.005)	0.157*** (0.003)	-0.005* (0.002)	0.018*** (0.004)	-0.093*** (0.011)	0.009*** (0.002)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Busi. Env. Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	73431	141912	144915	141214	125872	119149
Adjusted $R^2$	0.12	0.32	0.08	0.23	0.55	0.08

Note: This table examines the labor composition and cost differences between women and men led firms. All specifications include industry, country and year fixed effects, firm characteristics, and local business environment. Robust standard errors (in parentheses) are clustered at province\*sector\*size level. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 13: Extensive Growth, Access to Resources, and FTM

	Extensive Growth			Access to input	
	(1) Employment	(2) Sales	(3) Invest in fixed assets	(4) Access to finance	(5) Access to land
FTM	-0.008*** (0.001)	-0.013*** (0.005)	-0.022*** (0.004)	-0.001 (0.003)	-0.001 (0.001)
Firm Controls	Yes	Yes	Yes	Yes	Yes
Busi. Env. Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Observations	116935	115499	151092	141719	141719
Adjusted $R^2$	0.21	0.13	0.19	0.06	0.03

Note: This table examines the growth and access to input differences between women and men led firms. All specifications include industry, country and year fixed effects, firm characteristics, and local business environment. Robust standard errors (in parentheses) are clustered at province\*sector\*size level. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 14: Innovation, Productivity and FTM, Robustness Check with Country Year Trend

	Innovation		Productivity		
	(1) New product	(2) R& D	(3) TFPR(VAKL)	(4) TFPR(VKLM)	(5) Labor productivity
FTM	0.018*** (0.004)	0.019*** (0.006)	0.072*** (0.023)	0.023 (0.026)	-0.124*** (0.013)
Firm Controls	Yes	Yes	Yes	Yes	Yes
Busi. Env. Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Country Year Trend	Yes	Yes	Yes	Yes	Yes
Observations	123606	66624	46515	46515	128001
Adjusted $R^2$	0.21	0.19	0.31	0.30	0.44

Note: This table examines the performance differences between women and men led firms. All specifications include industry, country and year fixed effects, firm characteristics, and local business environment. Robust standard errors (in parentheses) are clustered at province\*sector\*size level. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .



Table 15: Innovation, Productivity and FTM, Robustness Check with Province FE

	Innovation		Productivity		
	(1) New product	(2) R& D	(3) TFPR(VAKL)	(4) TFPR(VKLM)	(5) Labor productivity
FTM	0.019*** (0.004)	0.014** (0.006)	0.065*** (0.023)	0.011 (0.027)	-0.126*** (0.013)
Firm Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes
Observations	123606	66624	46515	46515	128001
Adjusted $R^2$	0.22	0.22	0.32	0.30	0.45

Note: This table examines the performance differences between women and men led firms. All specifications include industry, province and year fixed effects, and firm level controls. Robust standard errors (in parentheses) are clustered at province\*sector\*size level. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 16: Labor Composition, Costs and FTM, Robustness Check with Country Year Trend

	Labor composition			Training	Labor costs	
	(1) SkillShare	(2) FemaleShare	(3) Temp. share	(4) Formal training	(5) Cost per labor	(6) Labor cost per sale
FTM	0.011** (0.005)	0.157*** (0.003)	-0.004* (0.002)	0.018*** (0.004)	-0.080*** (0.010)	0.010*** (0.002)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Busi. Env. Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Country Year Trend	Yes	Yes	Yes	Yes	Yes	Yes
Observations	73431	141912	144915	141214	125872	119149
Adjusted $R^2$	0.14	0.32	0.08	0.24	0.58	0.08

Note: This table examines the labor composition and cost differences between women and men led firms. All specifications include industry, country and year fixed effects, firm characteristics, and local business environment. Robust standard errors (in parentheses) are clustered at province\*sector\*size level. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 17: Labor Composition, Costs and FTM, Robustness Check with Province FE

	Labor composition			Training	Labor costs	
	(1) SkillShare	(2) FemaleShare	(3) Temp. share	(4) Formal training	(5) Cost per labor	(6) Labor cost per sale
FTM	0.006 (0.004)	0.156*** (0.003)	-0.005* (0.002)	0.017*** (0.004)	-0.087*** (0.010)	0.008*** (0.002)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	73431	141912	144915	141214	125872	119149
Adjusted $R^2$	0.17	0.34	0.10	0.25	0.58	0.10

Note: This table examines the labor composition and cost differences between women and men led firms. All specifications include industry, province and year fixed effects, and firm characteristics controls. Robust standard errors (in parentheses) are clustered at province\*sector\*size level. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 18: Extensive Growth, Access to Resources, and FTM, Robustness Check with Country Year Trend

	Extensive Growth			Access to input	
	(1) Employment	(2) Sales	(3) Invest in fixed assets	(4) Access to finance	(5) Access to land
FTM	-0.008*** (0.001)	-0.015*** (0.005)	-0.022*** (0.004)	-0.001 (0.003)	-0.001 (0.001)
Firm Controls	Yes	Yes	Yes	Yes	Yes
Busi. Env. Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Country Year Trend	Yes	Yes	Yes	Yes	Yes
Observations	116935	115499	151092	141719	141719
Adjusted $R^2$	0.22	0.15	0.19	0.07	0.03

Note: This table examines the growth and access to input differences between women and men led firms. All specifications include industry, country and year fixed effects, firm characteristics, and local business environment. Robust standard errors (in parentheses) are clustered at province\*sector\*size level. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 19: Extensive Growth, Access to Resources, and FTM, Robustness Check with Province FE

	Extensive Growth			Access to input	
	(1) Employment	(2) Sales	(3) Invest in fixed assets	(4) Access to finance	(5) Access to land
FTM	-0.008*** (0.001)	-0.014*** (0.005)	-0.021*** (0.004)	-0.001 (0.003)	-0.000 (0.001)
Firm Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes
Observations	116935	115499	151092	141719	141719
Adjusted $R^2$	0.22	0.15	0.21	0.09	0.05

Note: This table examines the growth and access to input differences between women and men led firms. All specifications include industry, province and year fixed effects, and firm characteristics controls. Robust standard errors (in parentheses) are clustered at province\*sector\*size level. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 20: Women-led Firms Have Greater Productivity Advantage with Higher Buddhist Share

	Innovation		Productivity		
	(1) New product	(2) R& D	(3) TFPR(VAKL)	(4) TFPR(VKLM)	(5) Labor productivity
FTM	0.007 (0.005)	0.014** (0.007)	0.039 (0.025)	0.003 (0.029)	-0.195*** (0.031)
Buddhist share	-0.044 (0.033)	-0.141*** (0.037)	-0.262** (0.117)	-0.221 (0.137)	1.506*** (0.326)
FTM * Buddhist share	-0.034 (0.025)	-0.048* (0.026)	0.310*** (0.103)	0.309*** (0.112)	0.448*** (0.160)
Firm Controls	Yes	Yes	Yes	Yes	Yes
Busi. Env. Controls	Yes	Yes	Yes	Yes	Yes
Country Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes
Observations	120833	65640	45875	45875	117693
Adjusted $R^2$	0.16	0.17	0.29	0.28	0.20

Note: This table examines how productivity changes with Buddhist share for women and men-led firms. All specifications include industry, region and year fixed effects, firm characteristics, local business environment, and country development indicators. Robust standard errors (in parentheses) are clustered at province\*sector\*size level. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 21: Women-led Firms Becomes More Innovative with Higher Muslim Share

	Innovation		Productivity		
	(1) New product	(2) R& D	(3) TFPR(VAKL)	(4) TFPR(VKLM)	(5) Labor productivity
FTM	-0.007 (0.006)	-0.007 (0.008)	0.053* (0.027)	-0.005 (0.032)	-0.148*** (0.035)
Muslim share	-0.050*** (0.012)	-0.047*** (0.014)	-0.098* (0.059)	0.014 (0.059)	0.417*** (0.158)
FTM * Muslim share	0.044*** (0.013)	0.058*** (0.017)	0.020 (0.066)	0.155** (0.077)	0.070 (0.108)
Firm Controls	Yes	Yes	Yes	Yes	Yes
Busi. Env. Controls	Yes	Yes	Yes	Yes	Yes
Country Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes
Observations	120833	65640	45875	45875	117693
Adjusted $R^2$	0.16	0.17	0.29	0.28	0.20

Note: This table examines how productivity changes with Muslim share for women and men-led firms. All specifications include industry, region and year fixed effects, firm characteristics, local business environment, and country development indicators. Robust standard errors (in parentheses) are clustered at province\*sector\*size level. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 22: Women-led Firms Have Smaller Productivity Advantage with Higher Christian Share

	Innovation		Productivity		
	(1) New product	(2) R& D	(3) TFPR(VAKL)	(4) TFPR(VKLM)	(5) Labor productivity
FTM	0.027*** (0.008)	0.037*** (0.012)	0.130*** (0.040)	0.092** (0.038)	0.142*** (0.053)
Christian share	0.053*** (0.013)	0.023* (0.014)	0.096* (0.055)	0.066 (0.068)	-0.927*** (0.160)
FTM * Christian share	-0.047*** (0.012)	-0.065*** (0.017)	-0.146** (0.058)	-0.139** (0.065)	-0.487*** (0.080)
Firm Controls	Yes	Yes	Yes	Yes	Yes
Busi. Env. Controls	Yes	Yes	Yes	Yes	Yes
Country Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes
Observations	120833	65640	45875	45875	117693
Adjusted $R^2$	0.16	0.16	0.29	0.28	0.21

Note: This table examines how productivity changes with Christian share for women and men-led firms. All specifications include industry, region and year fixed effects, firm characteristics, local business environment, and country development indicators. Robust standard errors (in parentheses) are clustered at province\*sector\*size level. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .