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Abstract

This paper considers empowerment of women in firms from emerging market economies, with respect to participation in the boardroom either as the CEO or as one of the owners. This is of considerable importance as the involvement of women in the workplace is essential to GDP growth. We use data for a large cross-section of firms taken from the World Bank Enterprise Surveys from emerging markets to examine the determinants of female empowerment within firms by means of a bivariate probit model and matching analysis. This research finds that few firms in emerging economies have female senior managers and few have any female owners. The study identifies that firm size and access to finance are contributory factors but the most striking feature is the importance of national cultural attitudes towards women. The study further explores these cultural attitudes using data from the *World Values Survey*. It finds attitudes hostile to women in business to be more prevalent in men than women and associated with both religion and a love of tradition. Furthermore, attitudes that are more welcoming to women in business are associated with higher educational levels and a belief in democracy. Whilst these are not surprising results, finding empirical rather than anecdotal evidence that can be robustly quantified econometrically, is an improvement on the existing literature.

Keywords: -- Economics of gender; women in the workplace; female empowerment and development; emerging markets

Female empowerment in emerging market firms

1. Introduction

One of the Millennium Development Goals (MDGs) specifically focusses on gender equality and empowerment, that is, an increase in female participation in the non-agricultural labour market. It is stated: 'Economic empowerment is about making markets work for women (at the policy level) and empowering women to compete in markets (at the agency level)' (World Bank 2006: p.4). It was later extended to include the objective of achieving full and productive employment, including for women and young people, as part of the overall intention to reduce extreme poverty. The Inter-American Development Bank (2010) also promotes female empowerment in terms of 'expanding the rights, resources, and capacity of women to make decisions and act independently in social, economic, and political spheres' (p. 3), with a detailed examination of the issue by Dohnert et al (2017). Finally, the UN (2001) describe women's empowerment in terms of five components: women's sense of self-worth; their right to have and determine choices; their right to have access to opportunities and resources; their right to have the power to control their own lives, both within and outside the home; and their ability to influence the direction of social change to create a more just social and economic order, nationally and internationally.

However, this is only possible where women have access to opportunities and control of economic resources and in many societies barriers to female ownership and control are prohibitive. Some result from traditional values and perceived hierarchies that do not allow women to fully engage in economic activity and other from long established prejudices about competence and managerial ability. This paper examines the determinants of female participation in the workplace for a sample of emerging market firms from two different perspectives. The first uses economic factors at the firm and country level to model the likelihood that women have ownership and control of firms using World Bank Survey data, while the second considers what may influence the underlying societal attitudes towards levels of female education and competence based on data from World Value Surveys.

The paper proceeds as follows. The next section reviews the literature on the role of female empowerment in economic development, including agency, choice and decision-making in relation to markets. The structural causes of gender inequalities in access to, and control over, key economic resources is considered, in particular, the emphasis of education for girls relative to boys and the initial level of inequality in the distribution land and capital. This section will develop testable hypotheses and clarify the contributions of the study. Section three provides a background to the study by presenting stylised facts with respect to female empowerment in firms and to cultural attitudes towards women in business. Section four describes the data used in the analysis and section five the methodological approach. Section six presents the results of the determinants of female empowerment in the sample of firms used and section seven the results of the analysis of cultural attitudes using data for individuals. The conclusions are presented in section eight.

2. Literature Review

a. Economic empowerment and development

It is now well established in the literature that where women are economically empowered there are higher levels of economic growth, less poverty and more widespread levels of health, education and welfare. One strand focuses on the debate about the direction of causality between female empowerment and economic development (see Duflo, 2012 for a comprehensive survey). A definition of female empowerment is access to the basic economic aspects of development such as health, education and the opportunity to participate in the workforce as well as legal rights and the ability to contribute to the political process. Development that leads to a reduction in poverty can lessen inequality between men and women, if attitudes in society support this. However, Sen (1990) claims that discrimination against women hinders development while female empowerment has the opposite effect. This view was supported by the United Nations (2005), which states that gender equality is a prerequisite to achieving the other MDGs. In 2001, The World Bank reiterated this by calling for policies to enable institutions to reverse the gender imbalance and promote equality to enhance the process of development (World Bank, 2001) although ten years later this was replaced by a call for gender equality as a target to be followed not solely based on economic arguments (World Bank,

2011). Thus, female empowerment plays a central role in the development debate and the impact on economic development has been well documented (see Neumayer and Soysa, 2011; King and Mason, 2001; Sen, 1999).

b. Empowerment and educational opportunities

A second strand of literature emphasises the importance of education and there is a general consensus that policy efforts that focus on augmenting women's educational attainment play a major role in the promotion of women's employment and empowerment (Kabeer, 2017; Bussemakers et al. 2017). Tornqvist and Schmitz (2009) find that female economic empowerment is best achieved by equality in the distribution of economic resources and access to the labour market. Similarly, Golla et al (2011) claim that women are economically empowered when they are able to succeed and advance economically, including making and acting on economic decisions. Duffo (2012) claims that improving opportunities for women in the labor market provides the impetus for changes in the overall society and recent studies have shown that an increase in education is highly correlated with rising participation of women in the labour force (Bussemakers et al. 2017; Samarakoon and Parinduri, 2015), which leads to better outcomes for women in terms of economic and career attainment. Further, country specific studies find that improving education opportunities contributes to structural transformation, generates higher output and results in overall socio-economic development (Mehrotra and Parida, 2019). This is enhanced by an improvement in legal rights, particularly property rights and access to finance, as these are different for women and men in many countries, even as economies become richer and more developed. Nonetheless, there is still a gap in political participation in many countries. Sen (1999) emphasises the need to pay closer attention to the status of women both as a mark of respect in their own right but also as a basis for economic development. He states: "Nothing, arguably, is as important today in the political economy of development as an adequate recognition of political, economic, and social participation and leadership of women" (Sen, 1999, p 203). Munshi, and Rosenzweig (2006) found that as India moved into the world economy gender equality increased as girls were provided with an English-based education similar to that for boys. Thus, girls educated in English are better placed to take advantage of employment opportunities. Interestingly, this happened to a greater extent amongst the lower castes as they struggled to gain an advantage over

higher caste students. Jensen (2010) found that gender neutral policies that improve the economic welfare of households can improve gender equality, and that diversifying the economy and increasing women's options in the labor market can cause a change in attitude towards women in positions of responsibility. But even where there is nothing in custom or law that requires girls to be given less education than boys, education is a resource decision and if women face poorer job prospects in the labor market relative to men, it is not surprising that the investment will go to where the expected return is greater. This is especially pertinent to the present study as one of the central questions relates to the likelihood that the senior manager of the firm is female.

c. The empowerment of women as managers

Farré and Valla (2007) study the intergenerational transmission of cultural attitudes to female senior managers in firms and find that the children of women with a strong presence in the workplace expect to continue with this tradition. Vella (1994) provides some cross sectional evidence on the relationship between attitudes towards working women and the labor market and find that religious affiliation influences educational attainment and this determines whether or not women expect to rise to managerial positions within companies.

Nguyen et al (2015) examine the role of women on corporate boards in a multicountry study the EU and Australasia. Board gender diversity has also emerged as a contemporary policy debate in Vietnam. Competing theories seem to be important here and there is a developing literature that links female board membership and firm performance (Adams & Funk, 2012). With a focus on Latin America and the Caribbean, Flabbi et al. (2014) analyzed a large dataset of publicly traded companies and found that companies with more female members on the board were significantly more likely to have one female among the firm's executives. Furthermore, when women were at least 30 percent of the executives these firms also benefitted from a greater potential for growth and profit. Carter et al (2010) use both agency theory and resource dependence theory to explain this relationship. They state that according to agency theory, the monitoring function of the board plays an extremely important role in mitigating principal-agent conflicts, which ultimately affect performance (Fama & Jensen, 1983; Jensen & Meckling, 1976). Recent empirical studies suggest that greater gender diversity on boards has the potential to strengthen this monitoring function. For example, Adams et al (2009) find

that female directors have better monitoring ability as they think independently and are not hindered by established traditions. Women also can raise the levels of managerial accountability. Resource dependence theory suggests that the access to external resources is improved where there is gender diversity within the senior management of the firm, that is, firms with larger and/or more diverse boards may have advantages in obtaining and maintaining their important resources, including: human capital in the form of knowledge, skills, and talent; advice and counsel; channels of communication; and legitimacy (Goodstein et al, 1994; (Hillman and Dalziel, 2003; and Pfeffer and Salancik, 2003).

d. Empowerment and enterprise ownership

In some regions, women are expected to share in generating income and may have their own firms and enterprises although in others there are strong cultural restrictions on their mobility in the public domain. Such restrictions contribute to the much lower rates of female labor force participation in MENA region and South Asia while not in other parts of Asia. The literature on female ownership uses models that include standard economic variables, but also subjective variables, including motivation to start an enterprise and psychological measures of entrepreneurship, such as attitudes to risk and the willing to take control (Kabeer, 2012). In a study of small and medium enterprises in Vietnam, Bjerge and Rand (2011) found gender differences in the financing of firms. That is, while male and female owned enterprises were equally likely to access funds using formal bank loans, female entrepreneurs were more likely to get credit through Social Policy Banks. This was largely because they did not need to be secured by land or property, suggesting that female empowerment was still hindered by unequal property rights. Other studies have also suggested that access to financing is a possible cause of the productivity gap between women- and men-led businesses (Aterido et al, 2013; Presbitero et al, 2014)

In common with many of the quantitative studies on female led enterprises is that after gender differences in firm characteristics have been controlled, no further gender barriers are found to firm growth (Bardasi et al, 2007). However, Hallward-Driemeier (2011) finds that using qualitative interviews the opposite is the case and gender differences in obstacles exist not only in kind but also in

degree, particularly in securing accesses to finance but also to markets. In addition, Hampel-Milagrosa (2011) reports examples of woman entrepreneurs in Ghana who were denied business by male customers and purchasing agents on grounds of their gender. Other examples of gender-related obstacles that block women's career progress include corruption, old boys' networks, patronising procurement officials and lack of working capital. Both Orser et al (2010) and Marques (2015) have suggested that different export propensity between firms led by women and men may be a reason for the gender gap. Finally, Chen et al (2015) find that the innovative potential of a firm and the propensity to invest in research and development and introduce innovation may be affected by the gender composition of ownership and management and that women-led businesses could be at a disadvantage compared to similar men-led firms with respect to government contracts. All of these determinants are investigated in the empirical analysis that follows to see whether women-led businesses were particularly exposed to such constraints.

e. Barriers to female empowerment

Barriers to female empowerment emanate from interrelated causes and are part of a complex system of social, cultural and economic determinants (Cavacalti and Tacaes, 2015). Such traditional attitudes to gender equality may inhibit the acceptance of female managers within firms. This can result from religious or societal influences, both of which can hinder female empowerment. Sundstroånm et al. (2017) highlight legal restrictions, for example on travel without permission for women and the need to accompanied by a male, which complemented with customary restrictions hinder a woman's ability to work. Bussemaker et al. (2017) find that female employment is on average lower in countries with a more conservative social environment. Another important barrier may be that the decision to work is not a woman's own, but is determined by men and linked to social and cultural circumstances that resist change and constrain women's independence and autonomy (Subramaniam 1991; Sen 1993; Haugh and Talwar, 2011). Seguino (2011) examined the prevalence of religious beliefs decreased gender equality. However, no specific religion was more or less likely to be a hindrance to female empowerment. Data on gender attitudes from the World Values Survey, which is also used in the analysis in the present study, found that religion had an impact on behaviour in labor markets,

household decisions on resource allocation and government expenditure. Thus, career choices and time allocation as determined in the family, and educational opportunities provided by the state, were influenced religious and cultural attitudes held by dominant individuals. Kabeer (2012) finds these barriers are both intrinsic and imposed, they form the basis of gender inequality and frequently exist through institutional forms of discrimination and by the actions of powerful individuals and groups.

f. Summary and contributions of the study

The literature on female empowerment includes difficulties with decision making within firms, either as senior managers or enterprise owners. In general, the main challenges relate to access to financial resources and the ability to take responsibility for the allocation of funds, gender expectations and the difficulties of breaking into the network of large national operators. Using World Bank Enterprise Data, (Staritz and Reis, 2013) find that firms with female management are smaller, have more female employees and are in service or manufacturing industries. These firms have higher levels of exports but are more constrained by access to finance. However, firms with female senior managers are less likely to export.

The current paper extends this work by including all emerging markets in the World Bank Survey dataset. The primary contribution is to provide a robust econometric model that determines the factors that influence the likelihood that the CEO of a firm is a woman and that one of the owners of the firm is female. These two issues are an indication of the degree to which female empowerment exists. The paper also provides a quantitative appraisal of the impact of attitudes held that relate to women in the workplace. The results are not controversial or even surprising but support the anecdotal evidence that has existed for some time.

3. Background

Table 1 presents a summary of firm level data, taken from World Bank Enterprise Surveys, for a sample of 40 emerging market economies. It reports two measures of female empowerment within firms – (a) the proportion of firms where the senior manager is female and (b) the proportion firms whose owners include one or more females. Across the full sample female empowerment in firms is

low. Only 13.6% of firms in the sample reported a female senior manager and only 30.2% of firms reported having any female owners. In many countries the proportion of senior managers of firms who are female is substantially lower than the proportion of members of parliament who are female.

There are significant variations of these measures of female empowerment within firms by geographic regions and between countries within these regions. For example, in Eastern Europe and Central Asia (EECA) 20% of all firms in the sample reported a female senior manager. In the Middle East and North Africa (MENA) the comparable proportion was 5%. In the sample of firms from Latin America and the Caribbean (LAC) about 35% of firms had some female ownership. For MENA the comparable proportion was 14%. There were also important variations between countries within the same region. Within the EECA region only 3% of Azerbaijan firms reported a female senior manager and only 4% some female ownership. In contrast the comparable proportions for neighbouring Georgia were 27% and 38%. Within the LAC region only 6% of the sampled firms from Argentina reported a female senior manager, compared to 17% from Uruguay. Within the Asia region, more than 60% of firms from several countries (China, the Philippines and Thailand) reported some female ownership. In contrast, only 14% of firms in the sample from Pakistan reported some female ownership.

Table 1: Proportion of Firms with Females in a Senior Role, By Region and Country

Region/Country	Proportion of firms with:		Sample (number of firms)
	Female Manager	Some Female Ownership	
Asia (excluding Middle East and former Soviet)	14.68%	31.93%	14920
China	10.97%	60.55%	2689
India	7.62%	14.91%	8941
Malaysia	33.30%	39.62%	949
Pakistan	5.13%	14.16%	234
Philippines	21.99%	69.18%	1187
Thailand	67.93%	64.32%	920
East Europe and Central Asia	20.06%	35.13%	7182
Armenia	12.76%	25.21%	243
Azerbaijan	3.23%	4.07%	248
Belarus	33.68%	46.01%	285
Estonia	27.39%	42.61%	230
Georgia	27.02%	37.63%	285
Kazakhstan	20.93%	32.24%	430
Kyrgyzstan	26.51%	55.61%	215
Poland	20.52%	41.05%	385
Romania	21.43%	49.36%	476
Russia	19.08%	30.91%	3013
Slovenia	20.58%	43.22%	243
Ukraine	22.91%	39.71%	764
Uzbekistan	10.41%	34.16%	365
Latin America and Caribbean	12.38%	34.60%	7695
Argentina	6.42%	29.68%	919
Brazil	14.47%	55.12%	1645
Chile	8.36%	27.65%	897
Colombia	17.11%	41.50%	865
Ecuador	17.48%	30.75%	326
Mexico	10.69%	26.23%	1403
Peru	12.09%	28.44%	860
Trinidad & Tobago	14.11%	42.53%	333
Uruguay	16.78%	28.44%	447
Middle East and North Africa	5.04%	14.09%	5930
Egypt	5.49%	8.93%	2442
Jordan	1.83%	3.10%	546
Lebanon	4.35%	17.83%	483
Morocco	5.63%	11.90%	373
Tunisia	7.41%	37.21%	580
Turkey	7.13%	28.29%	813
West Bank and Gaza	2.40%	4.50%	417
Yemen	0.72%	2.73%	276
Sub-Saharan Africa	12.88%	27.53%	3401
Ghana	13.33%	30.78%	555
Nigeria	11.81%	19.87%	2057
Rwanda	17.28%	50.79%	191
Zimbabwe	14.72%	44.21%	598
Overall Sample	13.60%	30.25%	39128
Source: World Bank Enterprise Surveys			

Table 1 suggests that important differences in these measures of female empowerment within firms exist both between broad geographical regions and between different countries within these regions. That there can be considerable variation in these measures between neighbouring countries suggest that these variations are not wholly a result of geographic location. Nor is it likely that the differences in the role of females could be fully explained by economic differences. For example Turkey has a broadly similar per capita GDP to Brazil but only 7% of its sampled firms reported a female senior manager compared to 14% for Brazil. One possibility that this study seeks to explore are that these differences are, in no small part, cultural.

To explore further the possibility that female empowerment in firms may have been influenced by cultural attitudes, an analysis of attitudes towards women in emerging market economies was examined. The data were taken from the *World Values Survey* (wave 6), conducted between 2010 and 2014. Two of the statements within the questionnaire were:

- Statement V53: *On the whole men make better business executives than women*
- Statement V50: *When a mother works for pay the children suffer*

The responses available to respondents were ranked from 1 (strongly agree) to 4 (strongly disagree), with the mean response by both region and country reported in Table 2. Within the EECA region the two countries with the lowest mean score in response to statement V53 (men make better executives) were also the two countries with the lowest proportion of firms with a female senior manager (see Table 1). Within the LAC sample of countries Uruguay records the highest mean score in response to statement V53 and also has the highest proportion of firms with a female senior manager. In terms of regions, the MENA had the lowest score with respect to both statement V53 and V50. The same region also recorded the lowest proportion of firms with female senior managers and with female ownership. Conversely, the region with the highest scores for both statements (and hence the most positive attitude to the role of women in business) was Latin America and the Caribbean. However, the LAC region was substantially behind the EECA region with respect to the two measures of empowerment used in Table 1.

Table 2: Attitudes to the Role of Women at Work, by Region and Country

Statement V53: On the whole, men make better business executives than women do.					
Statement V50: When a mother works for pay, the children suffer.					
(1 = strongly agree, 2 = agree, 3 = disagree, 4 = strongly disagree)					
Region/country	Mean Values		Region/country	Mean Values	
	V53	V50		V53	V50
Asia (excluding Middle East & former Soviet)	2.341	2.209	Middle East and North Africa	2.072	1.982
China	2.592	2.515	Algeria	2.169	1.906
India	2.220	1.934	Egypt	1.747	2.102
Malaysia	2.338	2.943	Iraq	2.094	2.120
Pakistan	1.913	2.068	Jordan	1.925	1.559
Philippines	2.468	2.488	Lebanon	2.595	2.088
Thailand	2.721	1.982	Libya	1.899	2.049
East Europe and Central Asia	2.458	2.628	Morocco	2.123	2.094
Armenia	2.339	2.405	Palestine	2.158	1.845
Azerbaijan	2.014	2.392	Tunisiia	2.119	1.834
Belarus	2.389	2.809	Turkey	2.241	2.240
Estonia	2.721	2.929	Yemen	1.900	1.738
Georgia	2.349	2.138	Sub-Saharan Africa	2.397	2.620
Kazakhstan	2.414	2.633	Ghana	2.151	2.809
Kyrgyzstan	2.353	2.644	Nigeria	2.042	2.641
Poland	2.828	2.237	Rwanda	2.525	2.643
Romania	2.800	2.772	South Africa	2.569	2.419
Russia	2.418	2.565	Zimbabwe	2.551	2.841
Slovenia	3.001	2.863			
Ukraine	2.533	2.649	Full Sample	2.443	2.391
Uzbekistan	1.956	2.848			
Latin America and Caribbean	3.035	2.535	Source: World Values Survey		
Argentina	3.084				
Brazil	2.888	2.281			
Chile	3.148	2.731			
Colombia	3.029	2.615			
Ecuador	3.032	2.173			
Mexico	2.989	2.567			
Peru	3.109	2.683			
Trinidad	3.047	2.661			
Uruguay	3.103	2.698			

Tables 1 and 2 do not provide conclusive proof of a link between national and regional attitudes towards women in business and empowerment in firms. But they do provide a clear basis for more detailed analysis of the role of cultural attitudes, alongside other influences, on the empowerment of women within firms in emerging market economies. That is the central objective of the paper.

4. Data

This study uses two separate datasets. The first is a cross section of 39,275 firms and comprises mainly firm level data from World Bank Enterprise Surveys for 40 different countries, conducted between 2010 and 2016. Two binary dependent variables were used for female empowerment (taken from the enterprise survey data):

femman takes the value of 1 if the response is positive to the question - *Is the Senior Manager (of the firm) female?* and zero otherwise

femown takes the value of 1 if the response is positive to the question - *Amongst the owners of the firm, are any female?* and zero otherwise

In addition a number of firm and country level exogenous variables are included:

Firm level variables: firm size by class; the share of ownership that is foreign (%); exports as a share of total sales (%); age of firm (years); whether the firm receive a loan (0,1: 1=yes); access to finance as an obstacle (0-4); bureaucratic obstacles (0-4); and whether the firm bid for government contract (0,1; 1=yes). All variables are from the Enterprise survey database.

Country level variables: GDP per capita; rural population as share of total (%); female MPs as share of total (%); equal pay legislation (0,1: 1=yes); men make better bosses score (V53: high=disagree); and children suffer when women work (V50: high=disagree). The last two country level variables are taken from the *World Values Survey* and the remainder from the *World Bank Development Indicators*.

The second data set is a cross section of 90,360 individuals from the same 40 countries as above and is taken from Wave 6 of the *World Values Survey*. Again there were two dependent variables that capture cultural attitudes towards women in business:

femboss: 1 if the respondent agrees that men make better executives (V53)

femwork: 1 if the respondent agrees that when a mother works for pay the children suffer (V50)

Both questions were scored from 1 (strongly agree) to 4 (strongly disagree). These were converted to (0,1) variables by treating disagree and strongly disagree as 1 and other responses as 0.

In addition a number of exogenous variables are included:

Respondent answer to survey questions: how important is work? (V8: high=agree); how important is religion? (V9: high=agree); greater respect for authority would be good (V69: high=agree); tradition is important (V79: high=agree); private ownership of industry should be increased (V97: high=agree); how important is democracy? (V140: high= agree); whether an individual considers themselves to be religious (V147: 0,1 1=yes); whenever science and religion conflict religion is always right (V153: high=disagree); nature of employment (V231: 1 (mostly manual) to 10 (mostly intellectual)); income group (V239: 1 (low) to 10 (high)); gender (V240: 0,1 1=male); age (V242: in years); level education (V248: 0 (none) to 9 (university); and literate (V255: 0,1 1=yes).

5. Methodology

The general approach of the paper was to estimate two separate but related issues. The first step was to estimate the determinants of female empowerment in firms (as measured by (a) *femman* and (b) *femown*) including measures of national cultural attitudes towards women in business amongst the explanatory variables. The second step was to estimate a relationship between these attitudes towards women and other cultural values in the sample of individuals.

To estimate the determinants of the two separate (0,1) variables *femman* and *femown*. The model specification was such that both indicators of female empowerment were separately determined by the same set of explanatory variables but with stochastic disturbance terms that were correlated with each other. To do this we used the bivariate probit model by Greene (2012), which has the form:

$$\text{femman} = x' \cdot \alpha_1 + \varepsilon_1 \quad (1a)$$

$$\text{femown} = x' \cdot \alpha_2 + \varepsilon_2 \quad (1b)$$

where x is the common set of explanatory variables, and ε_1 and ε_2 disturbance terms that are correlated.

For the second stage (analysis of cultural attitudes using the sample of individuals) the two separate limited dependent variables capturing cultural attitudes to women in business were again assumed to be determined by the same set of variables with separate but correlated disturbance terms:

$$\text{femboss} = z' \cdot \beta_1 + u_1 \quad (2a)$$

$$\text{femwork} = z' \cdot \beta_2 + u_2 \quad (2b)$$

where z is the common set of explanatory variables, and u_1 and u_2 disturbance terms that are correlated.

For both stages we also used a matching estimator, which served two purposes. Firstly, these are robustness check on the key elements of the bivariate probit analysis. One of the more important justifications for using a matching estimator is to reduce the risk of sample selection bias. Accordingly, the matching estimates provide an indication as to whether our bivariate probit conclusions are robust with respect to sample selection issues. Secondly, the matching estimators are also used to provide insights in their own right. For example, average treatment affects (ATT) were estimated for several different levels of education. Comparison of the results provides an indication of the level of treatment (education) at which attitudes to women in business are changed. Following King and Neilson (2016), matching according to Mahalanobis distance was used in preference to the more common propensity score matching approach.

6. Analysis of Determinants of Female Empowerment in Firms

Table 3 reports the results of the bivariate probit estimation of female empowerment within firms from emerging market economies. The variables of primary interest are the two variables for country level cultural attitudes to women – national mean values for statement V53 (men make better bosses) and V50 (children suffer when women work). With respect to the dependent variable *femman* (1 if the senior manager is female, 0 otherwise) the coefficients for both V53 and V50 are positive and statistically significant. That is, firm in countries where individuals typically disagree with both statements are more likely to have female senior managers. It is also worth noting that the coefficient for V53 is not only statistically significant but its value (approximately 1.5) suggests it to have a powerful effect on whether or not the senior manager of a firm is female.

For the other dependent variable (whether the firm has some female ownership) both V53 and V50 have statistically significant and positive effects. Firms in countries where individuals are more disposed towards the role of women in business tend to be more likely to have some business were owners are female. As with female senior managers this effect is not only statistically significant but

of a high magnitude. The analysis in Table 3 supports hypothesis 1: that national cultural attitudes towards women in business are an important determinant of female empowerment within firms.

Table 3: Determinants of Female Empowerment in Firms - Bivariate Probit Estimation (Total)

Dependent variable: femman (1 if top manager female, 0 if not)					
	Label	Coef.	Std.Err	z	P>z
Firm size class	size1	-0.0463	0.0115	-4.01	0.000
% foreign ownership	foreign	-0.0016	0.0005	-3.11	0.002
exports as % of total sales	export	0.0021	0.0004	5.58	0.000
Age of firm in years	age	-0.0002	0.0001	-3.46	0.001
Firm received a loan (0,1)	loan3	0.0241	0.0199	1.21	0.225
Access to finance as an obstacle (0-4)	finaccess	-0.0107	0.0080	-1.34	0.179
Bureaucratic obstacles (0-4)	burcy	0.0049	0.0118	0.42	0.676
Bid for government contract (0,1)	govbid	-0.1545	0.0240	-6.44	0.000
GDP per capita (country level)	gdpcap	0.0000	0.0000	-3.13	0.002
Rural population as 5 of total (country level)	rural	0.0014	0.0009	1.53	0.127
female MPs as % of total (country level)	parl	-0.0081	0.0016	-5.09	0.000
Equal pay legislation (0,1)	equalpay	-0.4090	0.0315	-12.98	0.000
Non-discrimination in hiring legislation (0,1)	nondiscrim	-0.3056	0.0243	-12.59	0.000
Men make better bosses score: high=disagree (country level)	v53	1.4901	0.0665	22.42	0.000
Children suffer when women work: high=disagree (country level)	v50	0.2308	0.0463	4.99	0.000
Regional dummy for E Europe and Central Asia	EECA	-0.0114	0.0325	-0.35	0.725
Regional dummy for Latin America & Caribbean	LAC	-1.0226	0.0570	-17.95	0.000
Regional dummy for MENA	MENA	-0.3843	0.0487	-7.88	0.000
Regional dummy for Sub-Saharan Africa	SSA	-0.1329	0.0472	-2.81	0.005
constant	_cons	-4.6438	0.2124	-21.87	0.000
Dependent variable: femown (1 if there is at least one female owner, 0 if not)					
Firm size class	size1	0.0304	0.0095	3.19	0.001
% foreign ownership	foreign	-0.0039	0.0004	-9.44	0.000
exports as % of total sales	export	0.0019	0.0003	5.81	0.000
Age of firm in years	age	-0.0001	0.0000	-1.16	0.248
Firm received a loan (0,1)	loan3	0.1460	0.0168	8.71	0.000
Access to finance as an obstacle (0-4)	finaccess	-0.0069	0.0067	-1.02	0.306
Bureaucratic obstacles (0-4)	burcy	-0.0241	0.0100	-2.41	0.016
Bid for government contract (0,1)	govbid	-0.0202	0.0196	-1.03	0.301
GDP per capita (country level)	gdpcap	0.0000	0.0000	-3.12	0.002
Rural population as 5 of total (country level)	rural	0.0009	0.0008	1.16	0.245
female MPs as % of total (country level)	parl	-0.0003	0.0013	-0.24	0.813
Equal pay legislation (0,1)	equalpay	0.2710	0.0259	10.46	0.000
Non-discrimination in hiring legislation (0,1)	nondiscrim	-0.3093	0.0206	-14.98	0.000
Men make better bosses score: high=disagree (country level)	v53	1.1484	0.0575	19.98	0.000
Children suffer when women work: high=disagree (country level)	v50	0.3015	0.0403	7.49	0.000
Regional dummy for E Europe and Central Asia	EECA	-0.1187	0.0287	-4.14	0.000
Regional dummy for Latin America & Caribbean	LAC	-0.5691	0.0482	-11.80	0.000
Regional dummy for MENA	MENA	-0.2678	0.0381	-7.03	0.000
Regional dummy for Sub-Saharan Africa	SSA	-0.1823	0.0404	-4.51	0.000
constant	_cons	-3.8541	0.1778	-21.68	0.000
Number of observations	33,142				
Wald chi2(38)	4468.09				
Log likelihood	-28709.746			Prob > chi2 =	0.000
/athrho		0.7706	0.0137	56.09	0.000
rho		0.6473	0.0080		
LR test of rho=0: chi2(1) = 3767.07				Prob > chi2 =	0.0000

The results with respect to the remaining (control) variables are also of interest. Firm size has a statistically significant negative effect on female senior management, suggesting that female senior managers are more likely in smaller firms. With respect to female ownership the coefficient for firm

size is statistically significant and positive. This reflects the fact that firms with traded shares are typically likely to be larger. For both dependent variables the degree of foreign ownership was shown to have a negative effect on female empowerment within the firm. For the *femman* variable neither of the access to finance variables was found to have a statistically significant effect. For the *femown* variable the receipt of a loan had a statistically significant and positive association with female ownership but perceived obstacles arising from access to finance were not statistically significant.

Of the country level variables it is initially surprising that the existence of legislation on equal pay and non-discrimination in hiring has a statistically significant and negative effect on female senior managers. Further examination of the data (see Appendix 1) shows that in countries without legislation on non-discrimination, female senior owners are much more prevalent in solely owned firms and partnerships (as opposed to shareholding firms). This suggests that the absence of legislation on non-discrimination may force women to substitute the creation of their own company or a partnership as an alternative to employment in an existing firm. Of the remaining country level variables GDP per capita has a statistically significant and negative effect on both empowerment variables but the magnitude of the effects are very small. The rural population (as a percentage of the population) was not statistically significant in either equation 1a or 1b.

Table 4 reports the results of the bivariate probit estimation of the same two variables capturing female empowerment within firms but at the regional level. Careful interpretation is needed. For example within the MENA region the average score by country with respect to the belief that men make better executives (V53) does not have a statistically significant effect on female senior managers. This does not necessarily mean that either such views are rare in MENA countries since Table 2 clearly shows otherwise. What it does suggest is that there is insufficient variation in these attitudes across MENA countries to effectively distinguish those in which women are more likely to be senior managers from those which are not.

Table 4: Bivariate Probit Estimation of the Determinants of Female Empowerment in Firms by Region

		Asia (excluding Middle East & former Soviet)				East Europe and Central Asia				Latin America and Caribbean				Middle East and North Africa				Sub-Saharan Africa			
Dependent variable: femman (1 if top manager female, 0 if not)	Label	Coef.	Std.Err	z	P>z	Coef.	Std.Err	z	P>z	Coef.	Std.Err	z	P>z	Coef.	Std.Err	z	P>z	Coef.	Std.Err	z	P>z
Firm size class	size1	0.1036	0.0192	5.39	0.000	-0.1914	0.0273	-7.02	0.000	-0.1547	0.0261	-5.93	0.000	-0.0812	0.0522	-1.56	0.120	0.0399	-1.9800	0.05	-0.157
% foreign ownership	foreign	-0.0048	0.0010	-4.64	0.000	0.0000	0.0010	-0.03	0.978	-0.0020	0.0010	-1.98	0.047	-0.0011	0.0020	-0.56	0.576	-0.0020	0.0016	-1.26	0.208
exports as % of total sales	export	0.0039	0.0006	7.07	0.000	-0.0014	0.0010	-1.48	0.139	-0.0009	0.0011	-0.82	0.415	0.0024	0.0012	1.94	0.052	-0.0019	0.0018	-1.08	0.280
Age of firm in years	age	-0.0001	0.0001	-1.00	0.318	-0.0003	0.0001	-1.85	0.064	0.0002	0.0002	0.94	0.350	0.0001	0.0002	0.30	0.766	-0.0001	0.0001	-0.97	0.334
Firm received a loan (0,1)	loan3	0.1689	0.0317	5.32	0.000	-0.0209	0.0398	-0.53	0.599	-0.1105	0.0445	-2.49	0.013	-0.0670	0.0912	-0.73	0.463	0.0889	0.1004	0.89	0.376
Access to finance as an obstacle (0-4)	finaccess	-0.0081	0.0153	-0.53	0.597	-0.0318	0.0143	-2.23	0.026	0.0151	0.0176	0.86	0.389	0.0424	0.0310	1.37	0.171	0.0080	0.0303	0.26	0.792
Bureaucratic obstacles (0-4)	burcy	0.0160	0.0205	0.78	0.435	-0.0509	0.0256	-1.98	0.047	-0.0195	0.0269	-0.72	0.470	-0.0073	0.0514	-0.14	0.887	0.0343	0.0496	0.69	0.490
Bid for government contract (0,1)	govbid	-0.0792	0.0420	-1.89	0.059	-0.1729	0.0432	-4.00	0.000	-0.1047	0.0529	-1.98	0.048	0.0867	0.1087	0.80	0.425	-0.3826	0.0980	-3.90	0.000
GDP per capita (country level)	gdpcap	-0.0007	0.0000	-17.26	0.000	0.0000	0.0000	-6.82	0.000	0.0000	0.0000	-4.03	0.000	-0.0001	0.0001	-0.68	0.496	-0.0003	0.0001	-2.50	0.012
Rural population as % of total (country level)	rural	-0.1301	0.0096	-13.55	0.000	-0.0100	0.0023	-4.39	0.000	0.0062	0.0016	3.85	0.000	0.0012	0.0094	0.13	0.895	0.0063	0.0105	0.60	0.551
female MPs as % of total (country level)	parl	-0.0829	0.0041	-20.45	0.000	0.0200	0.0047	4.27	0.000	-0.0127	0.0039	-3.27	0.001	0.0292	0.0088	3.32	0.001				
Equal pay legislation (0,1)	equalpay					-0.3038	0.0559	-5.44	0.000					0.3476	0.6434	0.54	0.589				
Non-discrimination in hiring legislation (0,1)	nondiscrim	-0.5964	0.1450	-4.11	0.000	-0.2098	0.0559	-3.75	0.000	-0.0992	0.0657	-1.51	0.131	-0.9266	0.9145	-1.01	0.311				
Men make better bosses score: high=disagree (country level)	v53	3.1850	0.2452	12.99	0.000	1.1983	0.1381	8.68	0.000	-0.0391	0.4666	-0.08	0.933	0.2713	0.7063	0.38	0.701	-0.6261	0.8160	-0.77	0.443
Children suffer when women work: high=disagree (country level)	v50					0.2680	0.1223	2.19	0.028	-0.1707	0.2080	-0.82	0.412	1.9019	0.8687	2.19	0.029				
constant	_cons	2.6669	0.4671	5.71	0.000	-3.5064	0.4857	-7.22	0.000	0.3079	1.0963	0.28	0.779	-6.1492	2.4204	-2.54	0.011	0.6495	1.5906	0.41	0.683
Dependent variable: femown (1 if there is at least one female owner, 0 if not)																					
Firm size class	size1	0.0582	0.0164	3.55	0.000	-0.0237	0.0241	-0.98	0.325	-0.0966	0.0212	-4.56	0.000	0.1467	0.0319	4.59	0.000	0.0772	0.0327	2.36	0.018
% foreign ownership	foreign	-0.0048	0.0009	-5.62	0.000	-0.0038	0.0009	-4.27	0.000	-0.0087	0.0009	-9.66	0.000	-0.0009	0.0013	-0.73	0.463	-0.0003	0.0012	-0.28	0.779
exports as % of total sales	export	0.0041	0.0005	8.22	0.000	-0.0005	0.0009	-0.62	0.538	-0.0006	0.0009	-0.66	0.506	0.0027	0.0008	3.26	0.001	0.0014	0.0014	1.01	0.314
Age of firm in years	age	0.0001	0.0001	1.90	0.058	-0.0003	0.0001	-2.27	0.023	0.0002	0.0002	0.99	0.322	-0.0002	0.0002	-1.01	0.312	0.0000	0.0001	-0.44	0.660
Firm received a loan (0,1)	loan3	0.2601	0.0272	9.55	0.000	0.0357	0.0357	1.00	0.317	0.0570	0.0376	1.52	0.130	0.3462	0.0561	6.17	0.000	0.2050	0.0830	2.47	0.014
Access to finance as an obstacle (0-4)	finaccess	-0.0525	0.0131	-3.99	0.000	0.0009	0.0129	0.07	0.945	-0.0069	0.0147	-0.47	0.637	0.0033	0.0209	0.16	0.873	-0.0408	0.0255	-1.60	0.110
Bureaucratic obstacles (0-4)	burcy	-0.0248	0.0177	-1.40	0.161	-0.0311	0.0230	-1.35	0.177	-0.0049	0.0222	-0.22	0.826	-0.0281	0.0349	-0.81	0.419	0.0429	0.0427	1.00	0.315
Bid for government contract (0,1)	govbid	0.0203	0.0343	0.59	0.554	-0.0159	0.0380	-0.42	0.676	-0.0270	0.0428	-0.63	0.529	0.1429	0.0687	2.08	0.038	0.0376	0.0744	0.50	0.614
GDP per capita (country level)	gdpcap	-0.0003	0.0000	-8.50	0.000	0.0000	0.0000	-9.60	0.000	0.0000	0.0000	-1.88	0.060	0.0000	0.0001	-0.59	0.555	-0.0004	0.0001	-3.46	0.001
Rural population as % of total (country level)	rural	-0.0592	0.0082	-7.22	0.000	0.0008	0.0021	0.37	0.715	0.0098	0.0013	7.46	0.000	0.0034	0.0059	0.57	0.571	-0.0055	0.0089	-0.62	0.534
female MPs as % of total (country level)	parl	0.0127	0.0037	3.47	0.001	0.0117	0.0043	2.72	0.006	-0.0293	0.0032	-9.13	0.000	0.0334	0.0048	7.00	0.000				
Equal pay legislation (0,1)	equalpay					-0.3021	0.0508	-5.95	0.000	-0.1293	0.0546	-2.37	0.018	0.0105	0.3673	0.03	0.977				
Non-discrimination in hiring legislation (0,1)	nondiscrim	-0.3789	0.1150	-3.30	0.001	-0.3662	0.0514	-7.13	0.000					-0.6278	0.5094	-1.23	0.218				
Men make better bosses score: high=disagree (country level)	v53	2.8984	0.1972	14.70	0.000	1.7071	0.1267	13.47	0.000	-0.9847	0.3859	-2.55	0.011	0.8120	0.3686	2.20	0.028	0.5896	0.6932	0.85	0.395
Children suffer when women work: high=disagree (country level)	v50					0.7920	0.1112	7.12	0.000	-0.4566	0.1772	-2.58	0.010	1.7893	0.4839	3.70	0.000				
constant	_cons	-2.9422	0.3949	-7.45	0.000	-6.1083	0.4468	-13.67	0.000	4.5419	0.8954	5.07	0.000	-7.0230	1.1685	-6.01	0.000	-1.0305	1.3499	-0.76	0.445
Number of observations		13692				6827				6066				4466				2091			
Wald		chi2(26) 4379.01				chi2(30) 423.12				chi2(28) 492.92				chi2(30) 483.92				chi2(22) 274.56			
Log likelihood		-10844.13				-6788.52				-5662.48				-2184.74				-1701.79			
/athrho		0.6492 0.0226 28.77 0.000				0.9873 0.0289 34.17 0.000				0.7475 0.0315 23.75 0.000				0.4698 0.0565 8.32 0.000				0.8483 0.0569 14.92 0.000			
rho		0.5711 0.0152				0.7562 0.0124				0.6336 0.0188				0.4380 0.0457				0.6902 0.0298			
LR test of rho=0: chi2(1)		3767.07				1539.60				675.48				74.26				278.95			

In other respects Table 4 does suggest some consistency of behaviour across different regions but also some important differences. With respect to female senior managers one consistent finding is that (perceived) access to finance is not statistically significant. The effect of GDP per capita was negative and statistically significant, suggesting that female senior managers are more prevalent in the lower income countries, with the exception of the MENA region. Attitudes towards women (disagreement with the propositions that men make better bosses or that children suffer when women work) are positive and statistically significant with respect to the presence of female senior managers in Asia and Eastern Europe and Central Asia (EECA) and (to some extent) MENA but not in Latin America and the Caribbean (LAC) or Sub-Saharan Africa (SSA).

With respect to female ownership, Table 4 also suggests a mix of common patterns and regional differences. Access to finance (perceived obstacles) has a statistically significant negative effect on female ownership for Asia but no statistically significant effect for any other region. The share of ownership that is foreign has a statistically significant and negative effect on female ownership for Asia, EECA and LAC but not for MENA or SSA. GDP per capita has a statistically significant and negative effect on every region, indicating that female ownership is more prevalent in poorer countries within the region, again with the exception of MENA. Female ownership is positively and statistically significantly associated with disagreement with the propositions that men make better bosses or that children suffer when women work for three regions, Asia, EECA and MENA, and negatively associated with such attitudes in LAC. Neither are statistically significant in SSA.

Table 5 reports the matching analysis using both empowerment variables (*femman* and *femown*) as outcomes and the two national cultural attitudes variables (*femboss* and *femwork*) as treatments. These are intended partly as robustness checks on the conclusion (of the bivariate profit models) that such attitudes are important significant and partly to provide their own insights. The results show that comparatively few firms in this sample were in countries where individual on average agreed with the statement V53 (that men make better business executives than women). Table 5 shows that only about 10% of firms in this sample are based in countries where this is the majority view. Nevertheless, the extent to which such views are prevalent in the country in which the firm is located is shown to be both important and statistically significant. The average treatment effect (ATT)

show firms to be about 35% less likely to have a female senior manager when based in a country where such attitudes are typically present. Likewise, the average treatment effect (ATT) where female ownership is the outcome implies that some female owners are about 36% less likely where the view that men make better executives is representative of individuals in that country.

Table 5: Mahalanobis Matching Results for Firm Level Data

Sample	Treated	Controls	Difference	Standard Error	T-stat	Sample Size	
						Treated	Untreated
A. Outcome variable <i>femman</i> (firm has a female top manager)							
A.1 Treatment Variable: <i>femboss</i> (mean score for country indicates agreement that men make better executives)							
Unmatched	0.0546	0.1455	-0.0909	0.0062	-14.68	3,389	30,812
ATT	0.0546	0.4087	-0.3541	0.0324	-10.93		
A.2 Treatment Variable: <i>femwork</i> (mean score for country indicates agreement that children suffer when women work)							
Unmatched	0.1139	0.1438	-0.0299	0.0040	7.56	10,713	24,396
ATT	0.1139	0.1537	-0.0399	0.0227	1.76		
B. Outcome variable <i>femown</i> (firm has at least some female owners)							
B.1 Treatment Variable: <i>femboss</i> (mean score for country indicates agreement that men make better executives)							
Unmatched	0.1110	0.3221	-0.2111	0.0088	-24.11	2,983	30,214
ATT	0.1110	0.4687	-0.3577	0.0367	-9.74		
B.2 Treatment Variable: <i>femwork</i> (mean score for country indicates agreement that children suffer when women work)							
Unmatched	0.1840	0.3555	-0.1715	0.0053	-32.21	10,457	23,633
ATT	0.1840	0.2612	-0.0772	0.0290	-2.66		

The view that children suffer when women work (V50) was much more common in this sample of firms and Table 5 shows that about 30% of these firms were based in countries where, on average, individuals agreed with this view. Despite this being more prevalent it appears to have less effect on female empowerment within firms. The ATT with a female senior manager as the outcome was small, suggesting that firms in such countries were only about 4% less likely to have a female senior manager was shown to be statistically significant at 95% confidence and implies that firms in countries where such views are typical are about 7% less likely to have some female owners.

7. Analysis of Regional and National Cultural Attitudes to Women in Business

The preceding analysis has established that cultural attitudes towards women in business are an important determinant of female empowerment in firms. The object of this analysis is to identify other cultural attitudes that are associated with a disapproval of females in business. This is important as a

better understanding about what determines such attitudes may offer some guidance as to how they might be changed.

Table 6 reports the bivariate probit estimation of the WVS wave 6 data for our sample of just under 45,000 individuals from emerging market economies. The belief that men make better business executives is statistically significantly and negatively associated with the two variables capturing religiosity. Since high scores indicate disagreement with respect to the importance and relevance of religion this implies that strong religious beliefs are significantly associated with a belief that men make better executives. Likewise the same two religious variables are also statistically significantly and negatively associated with the belief that children suffer when a mother works. Again this suggests that religiosity is associated with disapproval of women in a working role.

For both dependent variables (women as executives and women at work) there is a statistically significant and negative association with the level of education of the respondent. That is, the higher the level of education the less likely they are to be opposed to the role of women working in business outside the home. Unsurprisingly, the gender of the respondent has a strong and statistically significant effect on attitudes towards women at work or in business. Men are substantially and significantly more likely to disapprove of the role of women than women themselves. Other beliefs and characteristics are also statistically significantly associated with these attitudes towards the role of women. A positive attitude towards the importance of democracy has a statistically significant and negative association: the stronger the importance of democracy to the respondent the less they disapprove of women in business. In contrast, a belief in tradition is statistically significant and associated with a negative attitude to women in business. Attempts to change attitudes and opinions are necessarily long term so it is unlikely that these findings offer anything immediate that will impact on women's lives. It is not surprising that it is the attitudes of men rather than women that inhibit the empowerment of women within firms but it does suggest that this is where the change must come and education is clearly the catalyst.

Table 6: Bivariate Probit Estimation of Views Associated with Attitudes to Women in Business – (Total)

Dependent variable <i>femboss</i> : 1 if respondent agrees that men make better business executives, 0 otherwise V53					
	Label	Coef.	Std.Err	z	P>z
importance of work from 1 (very important) to 4 (not at all important)	v8	0.0229	0.0092	2.49	0.013
importance of religion from 1 (very important) to 4 (not at all important)	v9	-0.0289	0.0081	-3.55	0.000
Whenever science and religion conflict, religion is always right - 1(agree) to 4 (disagree)	v153	-0.1305	0.0073	-17.98	0.000
Greater respect for authority would be : good(1) , bad (3)	v69	-0.0695	0.0099	-7.01	0.000
Tradition is important, scored from 1 (like me) to 10 (unlike me)	v79	-0.0324	0.0049	-6.68	0.000
Democracy important - scored from 1(not important) to 10 (important)	v140	-0.0191	0.0029	-6.54	0.000
Character of job - from 1(mostly manual) to 10 (mostly intellectual)	v231	-0.0123	0.0022	-5.51	0.000
Gender: male==1, female=2	v240	-0.4475	0.0127	-35.35	0.000
age (in years)	v242	-0.0007	0.0004	-1.66	0.098
level of education from 0 (none) to university degree (9)	v248	-0.0368	0.0030	-12.11	0.000
Regional dummy for E Europe and Central Asia	EECA	0.0331	0.0204	1.63	0.104
Regional dummy for Latin America and the Caribbean	LAC	-0.9171	0.0222	-41.30	0.000
Regional dummy of Middle East and Nortn Africa	MENA	0.1568	0.0221	7.11	0.000
Regional dummy for Sub-Saharan Africa	SSA	-0.0529	0.0217	-2.43	0.015
constant	_cons	1.6768	0.0482	34.81	0.000
Dependent variable <i>femwork</i> : 1 if respondent agrees that "When a mother works for pay the children suffer", V50					
importance of work from 1 (very important) to 4 (not at all important)	v8	0.0140	0.0091	1.54	0.123
importance of religion from 1 (very important) to 4 (not at all important)	v9	-0.0761	0.0080	-9.56	0.000
Whenever science and religion conflict, religion is always right - 1(agree) to 4 (disagree)	v153	-0.0918	0.0071	-12.88	0.000
Greater respect for authority would be : good(1) , bad (3)	v69	0.0449	0.0098	4.58	0.000
Tradition is important, scored from 1 (like me) to 10 (unlike me)	v79	-0.0260	0.0048	-5.44	0.000
Democracy important - scored from 1(not important) to 10 (important)	v140	-0.0204	0.0029	-7.07	0.000
Character of job - from 1(mostly manual) to 10 (mostly intellectual)	v231	-0.0021	0.0022	-0.95	0.340
Gender: male==1, female=2	v240	-0.1488	0.0124	-11.98	0.000
age (in years)	v242	0.0026	0.0004	6.16	0.000
level of education from 0 (none) to university degree (9)	v248	-0.0340	0.0030	-11.31	0.000
Regional dummy for E Europe and Central Asia	EECA	-0.4340	0.0203	-21.37	0.000
Regional dummy for Latin America and the Caribbean	LAC	-0.4469	0.0210	-21.30	0.000
Regional dummy of Middle East and Nortn Africa	MENA	0.2510	0.0223	11.24	0.000
Regional dummy for Sub-Saharan Africa	SSA	-0.4727	0.0217	-21.76	0.000
constant	_cons	1.0391	0.0471	22.08	0.000
Number of observations		44,836			
Wald chi2(30)		9054.29			
Log likelihood		-56294			
/athrho		0.2502	0.0081	30.95	0.000
rho		0.2451	0.0076		
LR test of rho=0: chi2(1) = 978.75		Prob > chi2 = 0.0000			

Table 7 reports the results of the bivariate probit estimation at the regional level. Country dummy variables were included in the models to capture the effects of differences in attitudes to women between countries within a region not otherwise identified. It is not surprising that these country dummies are very often statistically significant suggests that differences in values and attitudes between countries are very much more complex than can be fully described in a single specification. Despite this, the model does identify some useful generalization and evidence of regional differences of consequence.

The table shows that, in each region, the response to question v153, *whenever science and religion conflict, religion is always right*, ranked from 1 (strongly agree) to 4 (strongly disagree), is negative and statistically significant with respect to both attitudes captured by *femboss* and *femwork*. That is, in all regions attitudes supportive of women in business are associated with the view that does religion takes priority over science. Another common feature across regions is the role of education. In all regions except Eastern Europe and Central Asia (EECA) the results show a statistically significant and negative association between the level of education and the two variables capturing attitudes towards women. However, it is worth noting that of regions respondents in the EECA tend to be more supportive of a role for women than most but these attitudes simply depend less on the level of education.

In almost all cases the gender of the respondent is highly relevant to the attitudes to women in business or at work. Overwhelmingly, women are much more supporting of a role at work in or business for other women. Attitudes that value tradition are statistically significant and negative with respect to both dependent variables in most but not all regions, implying that traditionalists are less supportive of women in business. There are no common conclusions with respect to the role of age in attitudes towards women in business across the regions. In many cases there is no statistically significant association and where there is, younger people are more likely to be supportive of women in some regions and older people in others.

Table 8 provides evidence to confirm that individuals whose values prioritise religion over science are much less likely to be supportive of women as business executives. The estimated treatment effect (ATT) is negative and statistically significant. It is also substantial. The matching results confirm a negative and statistically significant ATT between valuing tradition and support for women in business, although the coefficient is small. The results also confirm a significant and considerable difference in attitudes between men and women. A more academic education is shown to have a statistically significant and positive treatment effect, with those with an academic secondary education or more are shown to be significantly more likely to be supportive of women in business. Table 8 also shows a similar result for university education. By differentiating between levels of education these results imply that the critical component is an academic rather than a vocational

secondary education. Finally, Table 8 considers the treatment of democratic values at two different levels: those that consider the importance of democracy at 5/10 or higher versus the rest and those that rate its importance at 8/10 or higher versus all others. Treatment effects (ATT) are positive and statistically significant for both categories, suggesting an association between democratic values and a supportive attitude to women as business executives. However, the effect is greater for the latter category, providing evidence that the greater the importance of democracy to the respondent the more likely they are to support women as business executives.

Table 8: Mahalanobis Matching Results for Individual Data (World Values Survey)

Outcome: Question v53 - " On the whole, men make better business executives than women do."							
(scored from 1 strongly agree to 4 strongly disagree)							
Sample	Treated	Controls	Difference	Standard Error	T-stat	Sample Size	
						Treated	Untreated
A. Religion							
Treatment : respondent agrees or strongly agrees with "Whenever science and religion conflict, religion is always right."							
(scored from 1 = strongly agree to 4 = strongly disagree)							
Unmatched	2.3028	2.6008	-0.2980	0.0094	-31.55	23,303	20,121
ATT	2.3028	2.4808	-0.1780	0.0175	-10.15		
B. Tradition							
Treatment : 1 if Tradition important to the respondent, 0 if not							
Unmatched	2.4075	2.5626	-0.1550	0.0126	-12.33	32,947	7,679
ATT	2.4075	2.4624	-0.0549	0.0175	-3.13		
C. Gender							
Treatment: 1 if respondent is female, 0 if male							
Unmatched	2.6530	2.2595	0.3935	0.0098	40.36	18,214	22,123
ATT	2.6530	2.3198	0.3332	0.0131	25.51		
D. Education							
Treatment: 1 if the respondent has more than primary education, 0 if not							
Unmatched	2.4791	2.2859	0.1932	0.0120	16.12	31,685	8,724
ATT	2.4791	2.4090	0.0700	0.0391	1.79		
Treatment: 1 if the respondent has technical/vocational secondary education, 0 if not							
Unmatched	2.4330	2.4391	-0.0062	0.0109	-0.57	11,657	28,752
ATT	2.4330	2.4344	-0.0015	0.0151	-0.1		
Treatment: 1 if the respondent has university-preparatory secondary education or some university, 0 if not							
Unmatched	2.5059	2.3700	0.1359	0.0099	13.77	20,028	20,381
ATT	2.5059	2.4449	0.0610	0.0145	4.19		
Treatment: 1 if the respondent has some university education, 0 if not							
Unmatched	2.5462	2.4016	0.1445	0.0114	12.63	9,982	30,427
ATT	2.5462	2.4686	0.0775	0.0172	4.51		
E. Democratic Values							
Treatment: 1 if the respondent ranks the importance of democracy as 5/10 or higher, 0 if not							
Unmatched	2.4432	2.3892	0.0539	0.0147	3.68	35,314	5,282
ATT	2.4432	2.3894	0.0538	0.0191	2.81		
Treatment: 1 if the respondent ranks the importance of democracy as 8/10 or higher, 0 if not							
Unmatched	2.4580	2.3866	0.0713	0.0107	6.67	28,184	12,412
ATT	2.4580	2.3720	0.0860	0.0140	6.15		

8. Conclusions

The empowerment of women within firms from emerging market countries has been barely researched at all. Analysis of our sample of emerging market firms shows that less than 14% of firms have a female senior manager. Although there is considerable variation by broad geographical region and by country, for only 6 of the 40 countries in our sample were more than 25% of firms found to have a woman as their senior manager. Close to 70% of the emerging market firms in our sample had no female owners at all. Again there are important variations by geographical region and by country. Female ownership is particularly rare in MENA countries and more common in EECA and LAC countries.

Our analysis of firms identifies explanations of the reasons for low rates of female empowerment in emerging market firms. Across the full sample female senior managers are typically employed by smaller rather than larger firms. Finance does not seem to be a significant constraint for firms managed by a female. By far the most important determinant of whether or not a firm has a female senior manager are the national cultural attitudes to the role of women in business and, more generally, at in the workplace in general. Those countries with higher rates of agreement that women make worse executives or that children suffer when women work outside the home are markedly less likely to have firms with female senior managers. With respect to firms with at least some female owners finance does matter: the firm having received a loan does make them more likely to have female owners. Female ownership, unlike having a female senior manager, is more likely in larger than smaller firms. Again, by far the most important determinant was found to be national cultural attitudes towards women in business and at work.

The first part of our analysis establishes that national cultural attitudes towards women are of substantial importance to understanding female empowerment within emerging market firms. The second part considers the extent to which these attitudes towards women are associated with other views of society at large. Unsurprisingly the characteristic most associated with disapproval of women in the boardroom is gender. Men are much more likely to disapprove of female empowerment in firms than women. Both religion and a love of tradition are strongly associated with disapproval of

women in business or in the workplace. An important factor which reduces hostility to empowerment of women is education and the more educated an individual the less likely they are to believe that women should not be executives or at work.

Overall this study concludes that factors such as finance are relevant to the empowerment of women in emerging market firms but a change in cultural attitudes would have much more substantial effects. Given the role of religion some aspects of introducing a change of hearts and minds may be difficult if not infeasible. However, the results show that it is male rather than female attitudes that most need change so any hearts and minds campaign would need to address male attitudes. That a respondent's level of education tends to increase acceptance of a role for women offers some encouragement. Investment in education, whether or not specifically targeted at gender equality, offers the prospect of a significant change of attitudes to women in business. The results that the critical point in education is at the secondary level, that is an academic rather than a vocational one makes a substantial and significant difference. Either increasing the proposing of pupils in pre university education or increasing the academic content of vocational education may contribute to changing attitudes towards women. Likewise, the results of the study show that attitudes that value democracy are associated with those that are favorable to women in business. Measures to encourage democratic values could also be used to support effects to change attitudes towards women in business.

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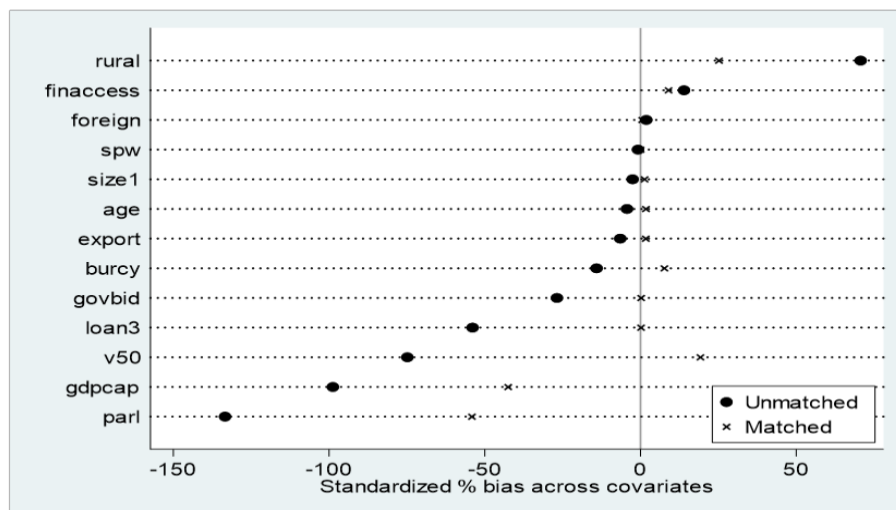
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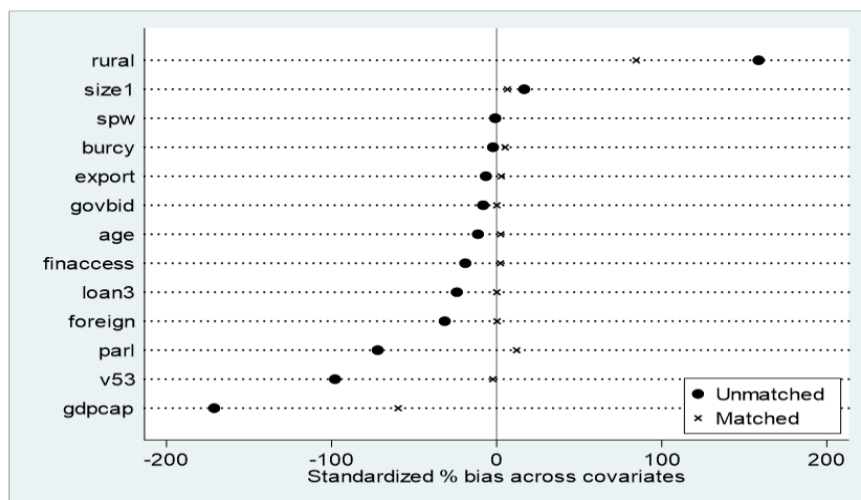
Appendices

Appendix 1: Firm Level Matching – Bias on Observables

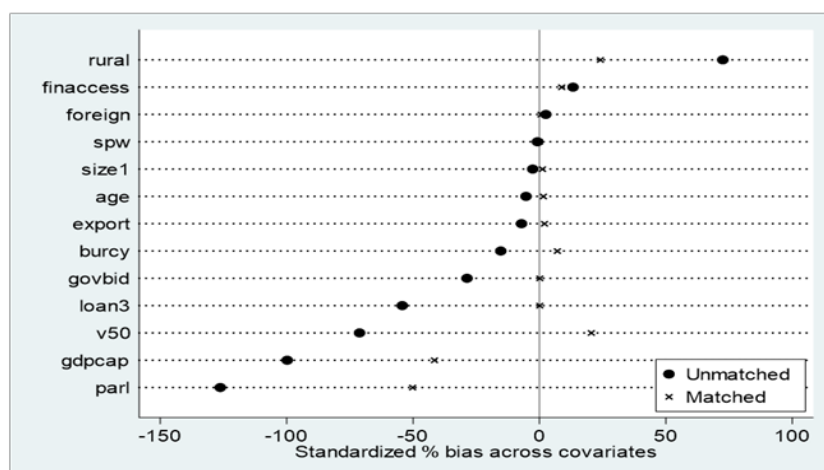
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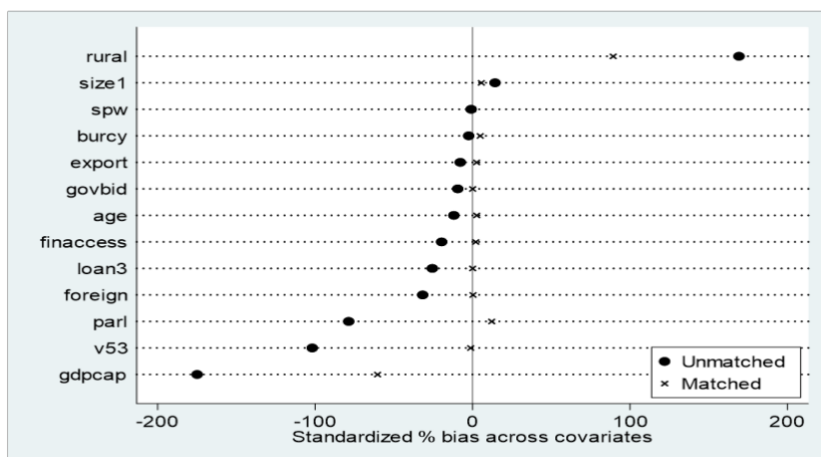
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Outcome = *femown*, Treatment = *femboss*



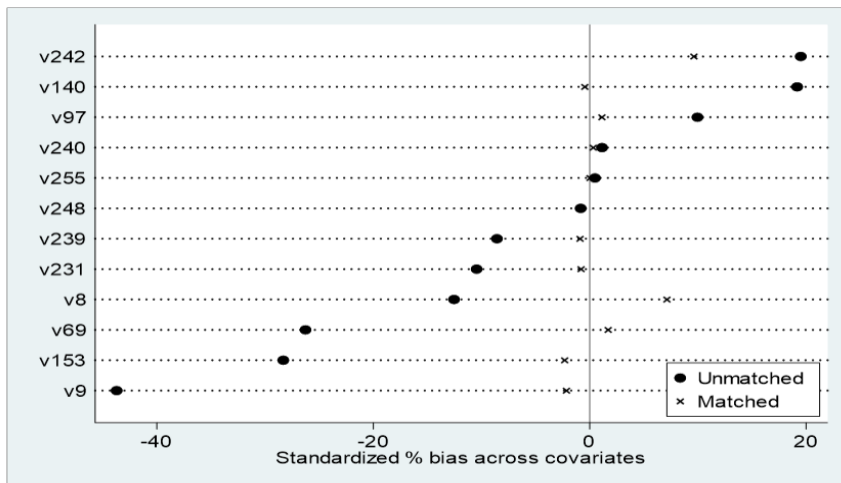
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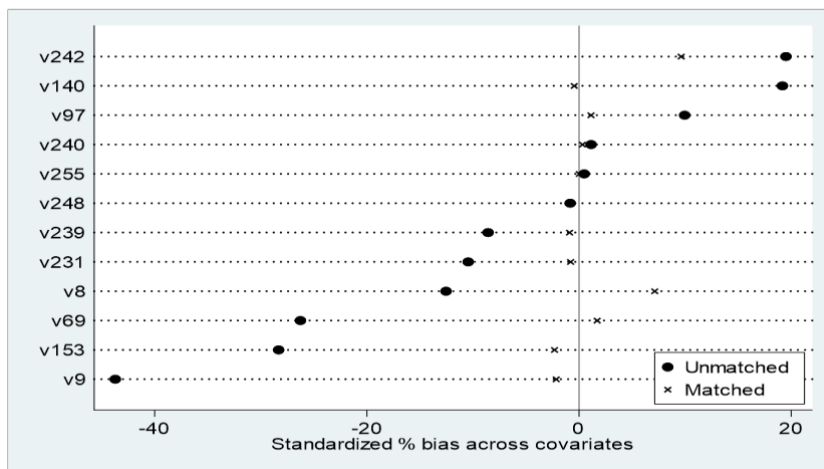
Appendix 2: Matching with Individual Level Data – Bias on Observables

Outcome variable = question V53, *men make better business executives*

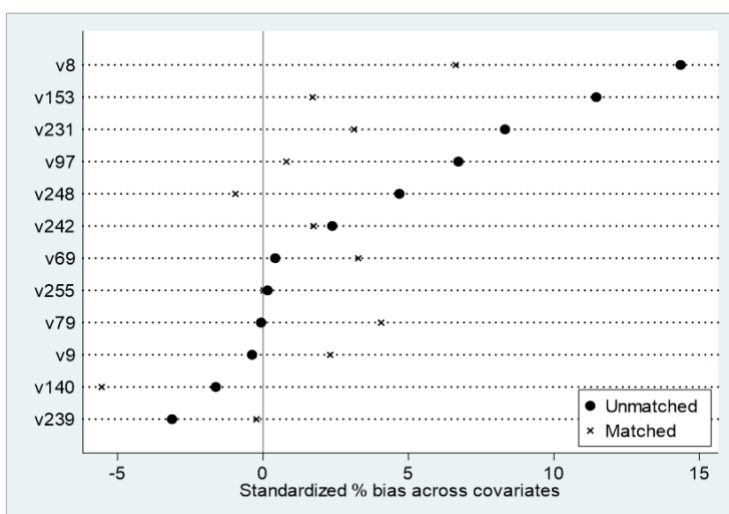
Treatment = religion



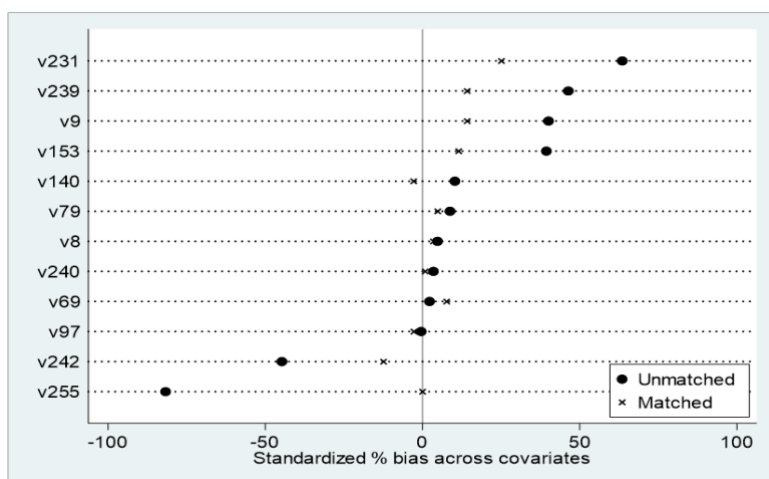
Treatment = tradition



Treatment = female



Treatment = education3



Treatment = democracy3

