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2016

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**GENDER AND LABOR ALLOCATION: THE ROLE  
OF INSTITUTIONS AND POLICIES  
IN THE ALLOCATION OF FEMALE AND MALE LABOR**

**Hadi Esfahani, Roksana Bahramitash and Bin Lin**

**Working Paper No. 998**

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**May 2016**

We are thankful for financial support to the Economic Research Forum and for very helpful comments to Nader Kabbani and to the participants in the ERF Workshop on Labor Market Institutions and Labor Market Performance and Outcomes" on May 25, 2014.

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First published in 2016 by  
The Economic Research Forum (ERF)  
21 Al-Sad Al-Aaly Street  
Dokki, Giza  
Egypt  
[www.erf.org.eg](http://www.erf.org.eg)

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## Abstract

There is enormous variation in the patterns of labor allocation, especially among women, across countries and over time, with significant consequences for the performance of the economy. The existing studies of this phenomenon often focus on binary choices and specific factors behind them, without taking account of the multiplicity of alternatives and the interactions among their determinants. Also, most studies rely on aggregate outcomes without taking into account the micro structures behind them. This paper takes a step to fill these gaps by employing a large, micro-level, cross-country dataset that allows us to identify the impact of country characteristics and policies on labor allocation probabilities, while allowing for nine different alternatives and controlling for individual gender, age, and education characteristics. Among many other results, the analysis suggests that effective government is one of the most important factors associated with female labor force participation (LFP) and employment. Also, in contrast to studies that suggest that natural resource rents reduce female LFP, we find that the opposite is true. Prevalence of Islamic culture proves to be a predictor of low female LFP, but we trace most of this effect to the traditions that are not necessarily Islamic. We also examine the role of business environment and labor protection policies. We find that some labor protection policies tend to be more beneficial for women's labor market activity than for men's. Such policies may be helping better employment matches to form.

**JEL Classification:** J1

**Keywords:** Female Labor Force Participation, Employment, Protection Policies

## ملخص

هناك تباين هائل في أنماط توزيع العمل، لا سيما بين النساء، في مختلف البلدان وعلى مر الزمن، مع وجود عواقب وخيمة لأداء الاقتصاد. غالبا ما تركز الدراسات الحالية لهذه الظاهرة على الخيارات الثنائية والعوامل المحددة التي تقف وراءها، دون مراعاة لتعدد البدائل والتفاعلات بين العوامل المحددة لها. أيضا، تعتمد معظم الدراسات على النتائج الإجمالية دون الأخذ بعين الاعتبار الهياكل الصغيرة التي تقف وراءها. تأخذ هذه الورقة خطوة لسد هذه الثغرات من خلال توظيف واسع، على المستوى الجزئي، لمجموعة البيانات عبر البلاد التي تتيح لنا التعرف على تأثير الخصائص والسياسات على احتمالات توزيع العمل في البلاد، في حين نسمح لتسعة بدائل مختلفة والسيطرة على الأفراد بين الجنسين، ومنها الخصائص العمرية، والتعليم. من بين العديد من النتائج الأخرى، ويشير التحليل إلى أن الحكومة الفعالة هي واحدة من أهم العوامل المرتبطة بمشاركة الإناث في القوى العاملة والعمل. أيضا، على النقيض من الدراسات التي تشير إلى أن إيجارات الموارد الطبيعية تقلل من عمل الإناث، نجد أن العكس هو الصحيح. فانتشار الثقافة الإسلامية يبرهن على أن تكون مؤشرا لانخفاض معدل مشاركة الإناث في القوى العاملة، لكننا نتبع أكثر من هذا التأثير إلى التقاليد التي ليست بالضرورة إسلامية. ندرس أيضا دور سياسات حماية العمل لبيئة الأعمال. نجد أن بعض سياسات حماية العمل تميل إلى أن تكون أكثر فائدة لنشاط المرأة في سوق العمل منها للرجال. هذه السياسات يمكن أن تساعد على وجود تشكيل أفضل لتطابق العمل.

## 1. Introduction

There is enormous variation in the patterns of labor allocation, especially among women, across countries and over time, with significant consequences for the performance of the economy (Mammen and Paxson, 2000; Freeman, 2009; Klasen and Lamanna, 2009; World Bank, 2012a; Elborgh-Woytek et al., 2013; Gaddis and Klasen, 2014). The studies that attempt to explain those patterns typically focus on the major determinants of the summary statistics of specific labor allocation outcomes—such as aggregate labor force participation (LFP), unemployment rate, or part-time employment rate. For example, oil rents and the prevalence of Islam are usually emphasized in expounding cross-country differences in female LFP (World Bank, 2004; Ross, 2008) and labor protection policies are often highlighted in explaining the variations in the unemployment rate across countries or over long periods (Blanchard, 2000 and 2005; Arpaia and Mourre, 2005; Freeman, 2009). This approach overlooks the connections among various labor allocation alternatives for an individual (e.g., homemaking, self-employment, full-time employment, etc.) and the fact that the determinants of each alternative must have impact on some other ones as well. As a result, important interactions among labor allocation outcomes and their determinants may be misconstrued or left out of the analysis. Capturing such interactions matters because they can provide essential insights about the ways in which the allocation of labor shifts among different alternatives in response to policy and non-policy factors.

There is a host of country-level studies that draw on micro data to shed better light on individual behavior (Freeman, 2009). However, single country studies do not entail sufficient variations in some potential drivers of the overall labor allocation, such as institutional factors, to provide much insight into the sources of cross-country variation in labor outcomes. Overcoming this obstacle requires comparable micro datasets across a large number of countries, which are rare. Micro data is needed for taking separate account of individuals' decisions, and a large number of countries must be covered to help identify the role of the host of country-level factors.

In this paper, we take advantage of the cross-country micro dataset collected by the Global Entrepreneurship Monitor (GEM) to take a step towards addressing the above concerns. The dataset allows us to control for the distribution of some key personal characteristics and, thus, better isolate the relationships between labor allocation and country policies and institutions. Based on the information available in the GEM dataset, we construct a labor allocation indicator with nine possible outcomes for each individual. We use a multinomial probit model with fixed country effects to relate the allocation of each individual's labor to his/her age, education, and country of residence. We then calculate the mean marginal probability effects of each country's setting on the distribution of male and female labor outcomes. Finally, we regress the estimated marginal probability effects on country-level variables from various sources, using a maximum-likelihood structural equations model (SEM) method with robust standard errors to deal with potential heteroscedasticity and cross-equation correlations of the error terms. We do not claim that all the relationships that emerged from the estimation of our model are casual because endogeneity and simultaneity are hard to avoid in such models. However, we believe that the picture that emerges from our results offers valuable insights and points to directions for further research.

Our analysis pays particular attention to the role of gender because the allocation of women's labor is the most visible source of cross-country variations in labor outcomes and has important implications for gender equality as well as economic and political development (Iversen and Rosenbluth, 2010; World Bank, 2012a; Elborgh-Woytek et al., 2013). Many scholars have made a case for gender equality as a way of enhancing economic growth and wellbeing (Klasen and

Lamanna, 2009). The main argument is that gender inequality and discrimination exacerbate poverty with clear adverse consequences for human capital formation and productivity (Barrientos and DeJong, 2006). The issue has attracted widespread attention in both academic and policy circles (Kabeer, 2013; Quisumbing, 2003; World Bank, 2012a).

In this paper, we allow the relationships of different factors with labor outcomes to vary for women and men. The system estimation that we employ enables us to take account of potential correlation among alternative outcomes for each gender as well as between them within each country. The results shed light on some key factors that shape female and male labor allocation across countries and help quantify the effects.

Since gender differences are most pronounced in the Middle East and North Africa (MENA) region, in our analysis of the estimation results, we emphasize the contrast between that region and the rest of the world and seek to shed light on the economic, institutional, and policy factors that may have contributed to the disparity. Most MENA economies suffer from high unemployment rates, particularly among the educated youth, and with substantially higher rates for women compared to men, as can be seen in Figure 1 (World Bank, 2004, 2012b, and 2013b; Galal, 2008; World Economic Forum, 2011; O'Sullivan, Rey, and Mendez, 2011). At the same time, the female LFP rates in the region are among the lowest in the world, especially when one controls for GDP per capita (see Figure 2). These outcomes have been blamed on a host of factors ranging from dysfunctional educational systems to the adverse incentives created by the distribution of resource rents, extensive public sector employment, and rigid labor regulations (Cinar, 2001; Karshenas, and Moghadam, 2001; UNDP, 2006; World Bank, 2004 and 2013b). However, there are also scholars who question such attributions. For example, some contend that, given the inherent imperfections in labor markets and depending on the circumstances, embracing the free market might adversely affect at least parts of the labor market, particularly women's employment conditions (Elson, 1999; Beneria et al., 2000; Colling and Dickens, 2002; Busmann, 2009). In this context, it is important to measure the correct effects of each factor on various types of labor in order to identify the main sources of the problem and to inform potential policy responses.

A central theme of our analysis is the role of labor market institutions and policies. While one needs to take account of country characteristics that influence labor-use distribution, it is important to examine the extent to which labor market policies and institutions matter, particularly because such factors can be changed more easily than more fundamental country conditions. Also, we have examined the roles of a number of country characteristics in a related paper (Esfahani and Bahramitash, 2015). Here we extend the discussion to additional factors, particularly labor markets policies and institutions.

One key finding of our analysis is that some labor protection policies such as minimum wage, parental-leave mandates, and priority rules that apply to redundancy lay-offs are indeed associated with higher full-time employment and LFP among women, but not among men. The results for the case of female labor appear to go against the grain of simple labor-market models. However, they make sense when one take account of market imperfections and the differences in labor decisions of men and women. A related observation is that such factors are generally associated with less self-employment or firm ownership, but larger shares of retired workers in the population.<sup>1</sup>

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<sup>1</sup> In this paper, we label all individuals earning income without work as "retired".

Interesting, these factors do not raise female unemployment rate, except in the case of a rise in the minimum wage.

Another important result concerns to the role of education in labor allocation. We find that while secondary and especially tertiary education contribute to LFP in the form of full-time employment and entrepreneurship at the individual level for both men and women, the country-level per capita years of schooling of women further shifts their labor allocation from homemaking and part-time jobs toward small firm ownership and full-time employment, with concomitant increase in the share of the retired. Interestingly, average male schooling creates competition for women and works in the opposite direction. The competition posed by average female schooling for men seems to act differently and to shift their labor away from employment and towards small firm ownership.

A third major finding is about the role of the business environment and government effectiveness. High cost of firm entry appears to reduce small firm formation by both women and men and to shift their labor mainly towards full-time employment. Poor infrastructure also adversely affects small firm ownership and induces more women who want to participate in the labor force to take on full-time or part-time employment. For men, the alternatives are full-time and self-employment. Government effectiveness, on the other hand, seems to enable women to shift their labor from homemaking to full-time and part-time employment.

Finally, our study offers insights regarding the debate on the role of oil vs. religion and culture in the low female LFP rates in the MENA region. Many scholars have pointed to Islamic traditions and culture as the main driver of this phenomenon (e.g., Pastore and Tenaglia, 2013, and references therein). However, Ross (2008) and a number of other studies have challenged that view and have argued that oil rents have been the main factor intensifying the division of labor in households and leading to low market participation by women. Our results cast doubt and the dominance of this effect of oil rents and suggest that the increased availability of financial resources are likely to have enabled many women to engage in self-employment or enterprise ownership. We also find that once we control for a host of country characteristics, the share of Muslims in the population remains associated with low LFP of women. However, we trace this effect to some legal rules that reflect a male-breadwinner culture and not Islam per se. Such rules tend to be more common Muslim countries, especially in the MENA region.

In the rest of this paper, we first offer a review of the literature and further highlight the contribution of our research. Then, in section 3, we describe the data and in section 4 we discuss our methodology. Section 5 presents the estimation results and section 6 offers policy implications and conclusions.

## **2. The Literature on Labor Allocation, Regulations, and Institutions**

Perhaps the most researched and debated theory concerning labor allocation over time and across countries is the U-shaped relationship between women's LFP and economic development (Mammen and Paxson, 2000; Goldin, 2006; Gaddis and Klasen, 2014). A key assumption behind the theory is that women in traditional societies are the primary family caregivers and this role restricts their ability to work away from home much more than it is the case for men. When the economy is not developed, incomes are very low, and production is mostly family activity, women's LFP is high because it does not conflict with their home responsibilities and every bit of income is badly needed by the family. With the advent of industrialization, the theory contends, labor market opportunities grow and production moves away from home, thus creating incentives for increased division of labor: men focus on market activity and bring home more income, while

women reduce their role in market production and concentrate on family care. However, as economies develop further, new equipment and services make household activities less demanding on women's time and workplaces may also become more accessible (Cavalcanti and Tavares, 2008; Coen-Pirani et al., 2010). At the same time, women's education levels and gains from labor market activity rise. The combination of these factors ultimately motivate increased female LFP.

There is a range of evidence in favor of the U-hypothesis, but it has not been unequivocal, particularly because the extent of any initial LFP decline and the timing and the degree of its later rise depend on the interactions of a host of factors such as culture, religion, geography, economic structure, institutions and policies (Gaddis and Klasen, 2014). For example, expansion in education, social protection, and social security, though welfare improving, tend to dampen the rise in female LFP. Indeed, these three factors seem to have induced a downward trend in men's LFP in the past several decades.

In past two decades, there has been growing research on the role of culture and attitudes in the extent and form of women's participation in the labor market. For example, Giavazzi, Schiantarelli, and Serafinelli (2013) use World Values Survey data to show that culture matters for women's employment rates and for hours worked. Also, Fernández and Fogli (2009) and Blau and Kahn (2011) use data on the national origins of female immigrants in the US to make a case for the importance of culture. Alesina, Giuliano, and Nunn (2013) go further and link the conservative attitudes towards women's roles to the historical use of plough in agricultural production and its implications for division of labor. [See Fernández (2013) for a recent review of the literature and a dynamic model of cultural change with rising female LFP.] Religion has also been highlighted as a major factor along culture. In particular, Islamic traditions have been viewed as impediments to women's LFP in the MENA region (World Bank, 2004). However, Ross (2008) challenges this notion and, using aggregate LFP data, argues that it is oil rent rather than Islam that hinders women's participation. More recent studies based on micro level data, such as Pastore and Tenaglia (2013), find that religions do seem to matter and some, like Orthodox and especially Muslim denominations, are associated with lower female LFP. Norris (2010) also raises similar points and applies a multilevel approach to World Values Survey to show that women's representation in parliament can be explained by egalitarian attitudes and not the absence of oil rent. On the whole, it seems that the results derived from micro data, which can better pinpoint the drivers of LFP, are more consistent with the view that culture and religion matter.

Another aspect of country institutions that has recently attracted more attention in the literature on labor allocation is women's economic rights and their control over property, especially under marriage. An important part of this research has been precipitated by the compilation of the WBL dataset (World Bank, 2013c). Hallward-Driemeier, Hasan, and Rusu (2013) explore the bivariate relationships between various legal indicators of gender equality and labor market outcomes for women across countries and find many of them to be significant. They also examine how those relationships change with the level of GDP per capita and with the rule of law. However, the bivariate nature of their exercise limits the inferences that one might make from the estimates. Hallward-Driemeier (2013) and Hallward-Driemeier and Hasan (2013) examine the patterns of legal rules in Africa and their impact on women's entrepreneurship. Hallward-Driemeier and Gajigo (2013) use a change Ethiopia's family law in 2000 that was initially applied only in two provinces and was then extended to the rest of the country as a natural experiment to assess the impact of strengthening women's legal rights on the types of economic opportunities that they pursue. Their study indicates that the reform had significant positive effects on the likelihood of



women working outside home and employing more educated workers in paid and full-time jobs. There are also a number of earlier studies that examine the impact of legal rights on women's access to land and credit. However, linking those rights to the extent and form of female LFP is rare. An important exception is the seminal work by Erica Field (2007), who evaluates the effects of a titling program in Peru. She finds, surprisingly, that securing a title did not change women's investment in their homes or plots of land, but it increased their labor supply away from home. She explains this outcome by suggesting that the secure titles had ensured the female owners' claims to their lands, obviating the need for them to remain on their plots.

Economic factors have also been widely recognized as major drivers of labor allocation. There is a large literature debating the impact of technological and structural change on female LFP, going back at least to Boserup (1970) and offering varied results (Gaddis and Klasen, 2014). The relative decline of agriculture and the rise of industry in the earlier stages of economic development are expected to lower female LFP rates, while the expansion of service at later stages can offer better opportunities for women to join the workforce. However, some recent studies suggest that once one controls for the stage of development via a variable such as GDP per capita, the remaining effects of sectoral structure of the economy on female LFP may be negligible. These studies, however, do not examine the impact of structure on the form of participation.

Another hypothesis concerning economic factors is the contention that natural resources rents may reduce female LFP (Ross, 2008; Gaddis and Klasen, 2014), though that claim is also far from established. Indeed, as we argue below, using micro data and controlling for more factors may yield the opposite result.

The role of trade and globalization has also been an important subject of debate, particularly because of the considerable employment of women in labor intensive export industries of many developing countries. Some studies such as Bussmann (2009) find that in developing countries, export orientation increases female LFP, especially by expanding women's employment opportunities in industry and agriculture. In developed countries, on the other hand, trade increases women's share of service sector employment, though on the whole it reduces their LFP rate. Gaddis and Pieters (2012) also find an increase in female LFP rate as trade barriers decline, especially when male job security and employment opportunities decline. In contrast, a cross-country study by Cooray et al. (2010) suggests that openness may reduce female LFP.

Yet another important and very relevant issue, which has been examined quite widely, is the impact of labor regulations on labor market outcomes. Much of the earlier literature in this area starts from a competitive model of labor market and by and large concludes that government interventions hamper the efficiency of production (Blau and Kahn, 1999). However, there has been a growing recognition in the literature that unregulated labor markets may give rise to inequitable and undesirable outcomes (Kabeer and Nathali, 2013), especially because of inadequate provision of insurance for workers. As a result, labor market institutions such as the minimum wage, unions, public sector employment, mandated severance pay, unemployment insurance, and centralized bargaining have come to be viewed as ways to address potential inequities and risks (MacLeod, 2011). In the mainstream economic policy literature, this view has often been translated into a tradeoff between equity and efficiency that in many countries has gone too far in favor of equity (OECD, 1994; Djankov and Ramalho, 2009). However, a large part of the academic literature has remained skeptical of that focus and has emphasized the need for deeper understanding of the ways in which labor markets operate, given the presence of significant imperfections that tend to undermine the efficiency of private contracts (MacLeod, 2011). In this view, some labor market

regulations could enhance equity as well as efficiency, while others could be bad for equity or efficiency or both. There is also increasing awareness in the literature that such effects could vary greatly across different situations and for different types of labor, especially by gender, age, and education. For surveys of this literature, see Arpaia and Mourre (2005), Bassanini and Duval (2006) and MacLeod (2011). Freeman (2009) provides a useful survey in the case of developing countries.

The empirical results based on the experience of OECD countries suggest that high and long-lasting unemployment benefits, high tax wedges and stringent anti-competitive product market regulations tend to raise aggregate unemployment, especially in the face of adverse productivity shocks (Bassanini and Duval, 2006; Oesch, 2010). By contrast, the long-run effects of employment protection legislation (EPL) are generally negligible, dampening the unemployment effects of shocks in the short run, while lengthening the adjustment period needed for unemployment to return to its initial level (Blanchard, 2000 and 2005; OECD, 2004: Chapter 2). On the other hand, active labor market programs (ALMPs) and centralized or coordinated wage bargaining seem to lower unemployment. Indeed, such institutions appear to dampen the effects of adverse macroeconomic shocks (Bassanini and Duval, 2006; Oesch, 2010). Also, labor mobility (e.g., a low rate of homeownership) tends to lower unemployment and lessens the adverse impact of shocks. Finally, ALMPs such as job-search assistance seem to be particularly helpful in improving the labor market experience of entrants to the job markets; e.g., the youth and some categories of female workers (Bassanini and Duval, 2006).

Most studies of developing country labor markets focus on the rigidity aspect of labor laws and often find to be associated with less formal employment, lower productivity, and higher unemployment, especially among the young and women (Botero et al., 2004; Djankov and Ramalho, 2009; Feldmann, 2009; Bernal-Verdugo et al., 2012). These are particularly common findings in India and Latin America, which have been studied more extensively (Besley and Burgess, 2004; Aghion et al., 2008; Ahsan and Pagés, 2009; Heckman and Pagés, 2004). However, even among these, there are many case studies that challenge such findings. For example, Paes de Barros and Corseuil (2004) and Downes et al. (2004) examine labor reforms in Brazil and the Caribbean and reject any significant adverse effect of labor protection on employment outcomes. Another challenge in the existing literature is that careful studies of the role of institutional factors require cross-country micro data. There are many studies that use micro data to assess the impact of regulations on employment and unemployment within single countries (Freeman, 2009).<sup>2</sup> However, such assessments face a limitation: labor market institutions typically remain unchanged for long periods of time, and when they experience transformation, the changes almost always coincide with other major shifts in the economy's conditions. This limitation makes it difficult to discern the effects of labor regulations. Many other studies have tried to deal with this issue by taking advantage of cross-country variations in institutions to explain aggregate indicators of labor market performance, such as the rates of unemployment and labor force participation. But, this approach faces another difficulty: aggregate performance indicators depend on a host of factors, such as the structure of the economy and the composition of the labor force that are hard to capture by country-level variables.

Chapter 8 of the *World Development Report 2013 (WDR 2013—World Bank, 2013a)* offers an extensive review of the evidence regarding the effects of labor market institutions—especially

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<sup>2</sup> Also, see Esfahani and Shajari, 2012, for a brief review of the literature and a case study of Iran.

employment protection legislation (EPL) and minimum wages—on labor market outcomes around the world. A general result of these reviews is that the overall effects of EPL and minimum wages on employment and unemployment remain largely ambiguous and seem to depend on the circumstances. *WDR 2013* notes the social value of EPL, minimum wages, and ALMPs that may enhance labor market efficiency, but cautions against their extensive use. It is clear from the review of existing evidence that a great deal more needs to be done to shed light on the economic consequences of labor market institutions, especially in developing countries where data availability has been more of a constraint.

In recent years, there has been an increased realization that labor market institutions themselves have deeper determinants that need to be explained. Botero et al. (2004), who initiated this line of research, attribute the more stringent regulation of labor to French legal origin (civil law) and to the political power of the left. Aghion et al. (2010) go beyond that claim and argue that distrust creates public demand for regulation, and regulation in turn discourages formation of trust. They use the World Value Survey dataset to support this claim and suggest that the results may explain the persistence of legal systems and inefficient regulations. Alesina et al. (2010), on the other hand, point to family ties as an alternative driver of demand for employment protection. They suggest that closer family attachments reduce labor mobility and enable firms to extract rent from their workers. However, this prompts workers and their families to develop a preference for more stringent regulation of employers. Alesina et al. (2010) also use World Value Survey data as well as historical population surveys in the United States to make a case for their propositions and show that close family ties and distrust of strangers, which are correlated, may jointly explain regulatory rigidity. They find that the pattern of labor market regulations at the beginning of the 21<sup>st</sup> century are correlated with the family values prevailing before World War II, suggesting that labor market regulations have deep cultural roots.

The literature on labor market institutions in the MENA region is not particularly large (for some examples and reviews, see in particular, Assaad, 2003; Kabeer, 2013; Ozar, 2007; Ross, 2008; World Bank, 2004, 2007, 2012b, and 2013b). On the whole, these studies highlight the role of rigid labor regulations along with cultural factors, extensive public sector employment, dysfunctional educational systems, and the adverse incentives created by the distribution of resource rents. While the correlations of these factors with unemployment in MENA presented in these studies seem plausible, the conclusions drawn from them are not always based on careful econometric work that discerns the separate effects of each factor. As a result, it remains unclear which factors are critical for the observed inefficiencies and which ones are marginal (or maybe inconsequential). Some country case studies try to address this problem by using micro datasets. In particular, Assaad (1997 and 2004) makes a case for the role of rents and extensive public sector employment in giving rise to high unemployment, especially among women, in Egypt.

Gender issues are at the center of the debates regarding MENA labor markets, as noted in the Introduction (World Bank, 2013b). Said (2001) highlights the role of public sector in shaping Arab labor markets and segmenting them along gender and nationality lines. An important endeavor in the recent literature has been to discern the differential impact of this and other factors on female vs. male labor in MENA. However, they mostly focus on macroeconomic factors and leave out the role of labor regulations.

Another important dimensions of labor market malaise in MENA countries is the high unemployment rates among the youth. This problem is typically explained by the youth bulge that

has emerged in the region in the past two decades in addition to the host of factors blamed for malfunction of labor markets in MENA more generally (World Bank, 2013b; Ahmed et al., 2012).

In this paper, we take a step towards better measurement of the effects of various factors on labor market outcomes in MENA, with an emphasis on labor market institutions and on differential effects on women and men. We use the GEM's cross-country micro dataset along with several other data sources to estimate a model of labor market outcomes that takes account of both individual and country characteristics.

### 3. The Data

Our main data source is the public GEM dataset, which at the end of 2014 included the results of representative sample surveys of individuals in 87 countries during 2001-2010. However, the question about labor market status is included only in the surveys conducted in 2009 and 2010. The surveys in these two years cover 74 countries with 321,988 observations, including 13 countries in MENA with 34,559 observations.<sup>3</sup> The average sample size for 2009-2010 is about 2,800 per country-year, but the range is quite wide, from about 730 to 28,000. The median sample size is about 2,000. This means that in statistical analysis, it is important to apply weights based on the sizes of country-year samples.

GEM questionnaires have a common set of core questions that are standardized across countries and are by and large consistent over time. These questions provide information about the characteristics of individuals. We combine the information about the individuals' labor allocation and their firm size, when they are firm owners, to form an indicator with nine possible values representing different outcomes: (1) Homemaker, (2) Retired (including anyone earning income without work), (3) Student, (4) Unemployed (or not in any other category), (5) Part-Time Employee, (6) Full-Time Employee, (7) Self-Employed, (8) Small Owner/Employer (firms with 1-9 workers), and (9) Medium/Large Owner/Employer (firms with 10 or more workers). We use only two categories of firm ownership to keep the number of observations in each category and in each country reasonably large.

Table A1 shows the summary statistics of country-level shares of the nine labor allocation alternatives by gender in our dataset, comparing MENA region with the averages of all countries included in GEM surveys. For the determinants of labor allocation outcomes, we consider two sets of variables: individual characteristics and country conditions. Individual characteristics include gender, age, and education. For age, we specify dummies that indicate whether the individual is in his/her 20s, 30s, ..., or 60's. The group in its 20s is selected as the base case and all other groups are compared with it.

The education indicator in the GEM dataset gives information on whether the individual has "No Education," "Some Secondary Education," "Secondary Education," "Post-Secondary Education," "Graduate Education," or "Other." We use No Education as the base case and compare all others educational levels with that category. We should note that educational attainment might be endogenous. We could not find an instrumental variable in our dataset that could help address this potential problem. However, as studies that manage to address the endogeneity problem show, the extent of the bias is likely to be small (see Esfahani and Shajari, 2012). Table A2 summarizes the

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<sup>3</sup> The MENA countries included in this set are: Algeria, Iran, Jordan, Lebanon, Morocco, Saudi Arabia, Syria, Tunisia, UAE, West Bank and Gaza, and Yemen.

age and educational structures of the countries in the sample, separating MENA and non-MENA countries.

The country-level variables that we include in our analysis span a range of economic, political, and institutional variables from various data sources. Specifically, we use PPP GDP per capita, average years of schooling, share of agriculture in GDP, and governance indicators from the World Bank's *World DataBank*.<sup>4</sup> For an indicator of trade costs, we turned to the trade freedom index available from Freedom of the World Dataset.<sup>5</sup> We obtained business environment indicators from the Doing Business (DB) website.<sup>6</sup> This site also provides a related dataset, Employing Workers Indicators (EWI), which contains information on many aspects of labor market regulations concerning minimum wage, restrictions and priority rules on hiring and firing workers, paid leave, severance pay, and the like. For data on religious characteristics of the population in each country, we employed the data collected by PEW Research Center.<sup>7</sup> Finally, for data on legal rules that matter for gender equality, we turn to the World Bank's dataset called Women, Business and the Law (WBL).<sup>8</sup>

For most country level variables, we average the data for 2000-2008 to reduce noise and to obtain indicator values prior to the time of labor allocation outcomes observed in the 2009-2010 GEM data. This reduces the chances of a simultaneity problem, though it does not fully remove that possibility. For schooling variables, the data is available for 2000, 2005, and 2010, which we average. In case of the WBL variables, the data is available for 2010, which is contemporaneous with the GEM data. However, this should not be a problem because the legal rules coded in the dataset change very occasionally over time.

#### **4. The Methodology**

We use a two-step process to estimate the associations between labor allocation and the individuals' characteristics and conditions. The first step is a multinomial probit model with nine possible alternative outcomes. In this regression, we control for age and education of individuals and allow the effects to vary by gender. We also include year effect to account for differences between 2009 and 2010 as well as country dummies to measure the overall impact of country conditions on each gender's labor allocation. Next, we calculate the marginal effects of each right-hand-side variable on the probabilities of each individual's labor allocation among the nine alternatives and, then, average them for men and women separately. Finally, we regress the average marginal probability effects of country dummies for the genders on a set of country socio-economic and institutional variables. This set includes indicators of labor market institutions as well as a series of country characteristics and policies as control variables. We discuss these variables in detail as we present the estimation results.

Our two-step process may be somewhat less efficient than some alternative approaches to multilevel model estimation, but it is computationally simpler and more flexible (Leoni, 2009). Some researchers have applied weights in the second stage based on the samples in first stage. But, as Lewis and Linzer (2005) argue, the OLS method with White's heteroscedastic consistent standard errors yields better results. In our model, however, the nine marginal probability effects

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<sup>4</sup> See <http://databank.worldbank.org/data/databases.aspx>.

<sup>5</sup> See <http://www.freetheworld.com/download.html>.

<sup>6</sup> See <http://www.doingbusiness.org/data>.

<sup>7</sup> See [www.pewforum.org/2014/04/04/religious-diversity-index-scores-by-country/](http://www.pewforum.org/2014/04/04/religious-diversity-index-scores-by-country/)

<sup>8</sup> See <http://wbl.worldbank.org/>.

are cross correlated and add up to one. This further means that the effects of any factor that shifts those probabilities must add up to zero across the equations for each gender. To deal with these constraints and to obtain robust standard errors while allowing for an unrestricted covariance matrix for the error terms, we employ Stata's maximum-likelihood structural equation modeling (SEM) technique.

In principle, there is a very large set of country-level indicators that one can use on the right-hand side of the country level equations. Since the number of observations is limited, one has to come up with a procedure to trim that set. One such procedure is to come up with aggregate measures (such as averages or principal components) for various groups of variables that are deemed as somehow contributing to the same function. Indeed, many variables that we employ here and are commonly used in the related literature, such as GDP per capita or governance indicators, are of such nature. However, for gender equality and for business and labor regulation variables we have more specific and detailed indicators. Rather than aggregating in ad hoc ways, we select the ones that seem most relevant and representative of their group and test them for statistical significance. We discuss the discarded indicators briefly, but focus on the ones that prove significant in the distribution of probability over labor outcomes.

The multinomial probit method used in the first stage of our analysis imposes no nesting structure on decisions among labor allocation alternatives. It is possible that the decision making by individuals involves a nested process in which some factors play a role within or between some groups of alternatives, but not among all alternatives. For example, an individual may first decide to participate in the labor market or not and, once that decision is made, to choose among alternatives of under each branch. This could be important if there are variable that affects the first decision, but plays no role in at the second level. For example, some cultural factors may determine whether women become homemakers or participate in the labor market, but play little role in the way they engage in the labor market once they choose to participate. If decisions are indeed nested in such ways, then the random factors that influence decisions may be correlated across some alternatives and a nested model may be more efficient. We did consider such possibilities. However, we could not pinpoint a convincing nesting structure with the required identifying variables, and it is not clear that such structure actually exists. Hence, we settled with an unrestricted multinomial probit model.

## **5. Estimation Results**

We have examined the results of the multinomial probit estimations regressions in a related paper (Esfahani and Bahramitash, 2015). Here we present the estimation results in the Appendix Tables A3 and A4 and briefly report on their main aspects. One observation based on the results is that, controlling for country conditions, women's participation rate in the labor force tends to increase by about 6-7 percent when their age group moves from the 20s to the 30s and 40s. This is largely because many are no longer students and seek jobs. The LFP rate drops by about 9 percent when women move from their 40s to 50s and another 10 percent when they reach 60s due to increase in retirement and homemaking. These changes are associated with reduced unemployment and greater full-time employment, self-employment, and enterprise ownership. The latter outcome is initially mostly in the form of small firm ownership. But, medium and large firm ownership also rises in later years. For men, the LFP and various forms of employment and enterprise ownership are more common in their 20s, when compared to women. Men's LFP rate goes up by more than 11 percent as they transit into their 30s and 40s, dropping by the same amount as they move to their 50s and more sharply when they reach 60s. This process is associated with a jump in men's

full-time employment probability when they pass 30 and then a significant, but gradual, shift to enterprise ownership.

Given that MENA has a younger population, part of its high unemployment and low SME formation, especially by women, could be explained by this age structure. However, the estimated coefficients suggest that this effect is likely to be small and other factors must have played large roles.

The probit estimation results also show that for women, increased educational attainment is associated in significant ways with reduced probability of homemaking and unemployment and increased rates of part- and full-time employment, student status, and medium/large firm ownership (after secondary level). For men, the directions of the shifts are large similar to those for women, but the magnitudes are generally smaller. The main difference is that education largely helps men move from unemployment and part-time employment towards full-time employment.

The educational attainment of women in MENA region has been improving, but it is still on the low side in most countries (on average about 7 years of schooling). This means that education is likely to have helped women's labor force participation in MENA, but has not yet reached a level to raise female entrepreneurship.

Table A5 summarizes the average marginal probability effects of country conditions, derived from the multinomial probit model, for MENA and non-MENA countries by gender. Before we proceed with the analysis these effects, it is helpful to compare the gap in labor allocation shares between MENA and non-MENA countries with the gap in the average marginal probability effects between the two groups, shown in the first two columns of Table 1. The share gaps in column 1 indicate that the biggest difference in labor allocation between MENA and non-MENA countries is in women's rate of homemaking, which is on average about 34 percentage points higher in MENA. This is followed by the full-time employment, part-time employment, retired, and small-firm owner shares, which are considerably lower among MENA women. There are also relatively more students and fewer unemployed and self-employed in MENA's female population. The differences in country marginal probability effects in column 2 indicate the extent to which the share differences may be due to country conditions other than the age and education structure of the population. The third column shows the difference between columns 1 and 2 and suggests that major parts the gaps in student and retired shares and smaller parts of the other shares may be explained by the differences in age and education structure of the female population. For the male population, the gaps between MENA and non-MENA shares are much smaller and there are far less differences to explain.

### ***5.1 Country conditions and labor allocation***

Table 2 shows the summary statistics of the country level-variables that we use in our statistical. The number of observations included in the regressions is 65 (12 MENA and 53 non-MENA countries), which less than 74 countries covered by the GEM dataset because of missing values. Dropping some of the included variables can help raise the number of observations, but that leaves the signs and significance levels of the coefficients of the remaining variables largely unaffected. The included variables are selected because they represent many essential drivers of labor allocation and indeed prove to be related to labor allocation outcomes in significant and plausible ways. There are additional variables that can be added to the regressions, but doing so reduces the degrees of freedom, which are already limited. Besides, most of such variables tend to proxy for factors broadly represented by the set of variables already included in our analysis.

Tables 3 and 4 present our main results for the relationships between the marginal probability effects of country conditions derived from the multinomial logit model and country characteristics, institutions, and policies. To show the effectiveness of the model in explaining the female labor allocation differences between MENA and non-MENA countries in our sample, we take the average value of each factor in the MENA group minus the average in non-MENA group and multiply the result by the statistically significant coefficients of that factor in Table 3. The results are shown in Table 5, where the last row reproduces the gaps to be explained from Table 2 and the row above it sums up the effects of the differences in all factors between MENA and non-MENA countries. A comparison of these two rows makes it clear that the model accounts for the gap in female labor allocation quite well. To highlight the significance of each variable in the variation of female labor allocation around the world, we also produce the percentage point change in the allocation shares associated with one standard deviation rise in the right-hand-side variables and present them in Table 6. We will come back to these tables once we have examined the variables one by one.

The first two variables, the log of real PPP GDP per capita and its square, are introduced as control variables for the level of development and for any factor behind the U-shape LFP rate that may not be captured by the variables included in the regressions. The results show that given the other factors controlled for in the regression, women's homemaking rate follows a U-shape trend as GDP rises, while their probability of being retired moves in the opposite direction. As a result, the female LFP rate tends to decline with income for the entire range of existing per capita incomes. This appears to contradict the U-shape hypothesis discussed in section 2. But, that is because we are controlling for a host of factors that tend to generate the U-shape trend, as Gaddis and Klasen (2014) also observe.

The estimates in Table 3 also suggest that the rise in GDP per capita is associated with an inverted U-shape trend in full-employment and a U-trend in small firm ownership that jointly yield a declining trend in these two positions for per capita incomes above PPP\$1100. Medium/large firm ownership tends to rise with income in that range, but its share remains very small.

These results may offer an explanation for small parts of MENA's low rates of female LFP, full-time employment, and small firm ownership because the region's GDP per capita is somewhat lower than the average for non-MENA countries in our sample. For example, the net effect on homemaking, based on the sum of the first two rows of Table 5, is 3.5 percentage points. However, it should be kept in mind that we are controlling for a number other factors that can account for much larger parts of the situation in the MENA region.

The above patterns largely apply to the case of male labor allocation as well, with the difference that in that case, retirement probability does not have any trend and the LFP rate tends to decline with income at a very slow pace compared to the case of women. On the other hand, the share of the unemployed in male population seems to go up first and then decline as per capita income rises.

The third and fourth rows of Table 3 offer insights about the role of aggregate educational attainments of women and men on the allocation of labor across countries. They show that controlling for male schooling, increases female schooling at the country level significantly shift women's labor from homemaking and part-time jobs towards full-time employment and firm ownership. (One standard deviation increase in female schooling lowers homemaking by about 10 percentage points and raises full-time employment by roughly the same amount.) Increased male



schooling, on the other hand, introduces competition for women in most of those positions and acts in the opposite direction. Despite recent increases in women's education in MENA countries, the gap in between female and male schooling is larger there than in the rest of the world. The sum of rows 3 and 4 of Table 5 indicate that the additional gender gap in schooling accounts for about 7 percentage points of the average 32 percentage point higher homemaking rate in MENA. This gap also explains about 3 percentage points the 13-point lower full-employment and 2 percentage points of the 6-point lower small firm ownership rates in MENA. However, this factor does not explain any part of the lower part-time employment share in MENA because the negative effect of female schooling on this share suggests that it should have been about 10 points higher in MENA region. So, other factors must have counteracted with it in major ways, as we will see below.

The impact of men's schooling on their labor allocation is, surprisingly, a reduction in medium/large firm ownership and increases in their probability of being student or unemployed (Table 4). Increased female schooling, on the other hand, shift's men's labor allocation from student and part-time positions towards firm ownership. This is possibly because of greater availability of educated labor and matches the sharp rise in full-time employment of women as their schooling increases.

The next variable included in our cross-country analysis is the share of agricultural value added in GDP, which is associated with significant shift in women's labor from homemaking to full-time employment as well as firm ownership. This is natural because, in line with the idea behind the U-hypothesis, agriculture often offers opportunities for women to own or to work on plots of land near their homes. The estimates in Table 3 indicate that one standard deviation in the share of agriculture in GDP means more than 6 percentage points increase in women's LFP rate and about 3 percentage points reduction in their unemployment and part-time employment rates, allowing 4 percentage points rise in full-time employment and 5 percentage points in firm ownership, especially small farms. The average share of agriculture in MENA countries is about 0.4 standard deviation higher than the one in non-MENA countries in our sample. As a result, rather than helping explain the difference between MENA and non-MENA countries in terms of female FLP and ownership rates, this factor adds to the gap to be explained (Table 2). For men, the share of agriculture in GDP is also associated with higher firm ownership rates, but lower probability of part-time employment and student status (Tables 4).

The sixth row of Table 3 offers the estimates regarding the effects of natural resource rents on female labor allocation. In contrast to Ross (2008), we find that such rents are associated with significant shift of women labor away from homemaking and towards self-employment and firm ownership of all sizes. There is also an increase in the share of the retired and (with much less statistical significance) full-employed women in the population. The net effect is a large positive association between resource rents and female LFP rate that can also be seen more directly on the right-hand side of Figure 2. This result should not be surprising because resource rents tend to increase the availability of financing for the private sector as well as fiscal resources for the government to support women's employment and economic activity. The implication of the finding for the comparison between MENA countries and the rest of the world is that other factor must be at work, more than counterbalancing the resource rents in the region. One standard deviation rise in natural resource rents, which is a bit less than the difference between MENA and non-MENA averages in this regards, reduces female homemaking by almost 7 percentage points,

while increasing firm ownership by 2.5 percentage points and self-employment and retires shares by more than 1 percentage points each.

Some key variables that have been highlighted in the literature to explain the low female LFP rates in MENA represent cultural and religious factors. When we include the shares of major religious denominations in the population in our regressions without any further controls for cultural factors, we find that the share of Muslims is strongly associated with higher homemaking and lower employment and entrepreneurship among women. The effect can explain more than 22 percentage points of the 32 point gap between MENA and non-MENA countries concerning female homemaking. In the regressions that we report in Tables 3 and 4, we try to go beyond this simple association and explore its underpinnings. For this purpose, we examined the role of a host of legal rules that reflect cultural and religious factors that may affect women's labor allocation, including non-discrimination laws, individual rights, property ownership under marriage, and business/finance status of women. The key aspect of such rules and institutions that matters most for labor allocation is the extent to which they are driven by patriarchal traditions. Two variables from the WBL dataset that seem to reflect that factor most effectively are restrictions on the ability of married women to travel outside the country in the same way as men do and the absence of joint legal responsibility of married couples for financial maintenance of family expenses. Another suitable variable for this purpose could be the response to a World Values Survey question regarding attitudes towards women and work, specifically the share of female survey respondents who agree or disagree with the statement that in case of job scarcity men should have more right to a job than women. But, the number countries covered by the survey is relatively small and using it cuts the sample size sharply. For this reason, we focus on the two WBL indicators, which are well correlated with the World Values Survey question anyway.

Adding the travel equality and joint legal responsibility indicators to the regression sharply reduces the size and significance of the effect of Muslim population share on female homemaking (Table 3). It now accounts for less than 10 percentage points of the gap between MENA and non-MENA countries in the female homemaking share, rather than 22 points. Instead, the absence of joint financial responsibility rule, which is the case in about 70 percent of MENA countries vs. 4 percent outside MENA, accounts for 11 points of the higher female homemaking rate in MENA (Table 5). Lack of travel equality, which is present in 7 MENA countries, but in only 2 countries outside MENA, accounts for 2.5 points of that margin. The increases in homemaking are associated with correspondingly lower employment and entrepreneurship rates. For example, the lack of joint responsibility implies about 5 percentage points lower small firm ownership probability in MENA. The share of Muslim population also tends to lower part-time and self-employment, but raises the probability of medium/large firm ownership and retired (which in our categorization includes all individuals with income, but no work).

For men, the share of Muslim population is correlated with more medium/large firm ownership as well as unemployment, but lower part-time employment and LFP rate (less homemaking, but more retirement). Lack of joint responsibility seems to be associated with a major shift in male labor allocation from small firm ownership to full-employment. Absence of travel equality, however, only appears to be connected with reduced self-employment.

## ***5.2 Governance, business environment, and labor allocation***

We now turn to the role of governance and business policies that affect the opportunities, costs, and payoffs of the various labor allocation alternatives. We experimented with the six aggregate measures offered by the World Governance Indicators and found that only the government

effectiveness indicator displays significant effects, being associated with a shift in female labor from homemaking to part- and full-time employment. MENA countries on average lag behind the rest of the world in terms of government effectiveness by about one standard deviation. This translates into 11 percentage points higher homemaking and 8 percentage points less employment share for women (Table 5).

In addition to the overall government effectiveness, we wanted to examine the effects of more specific indicators of infrastructure availability and business regulation. Most indicators of this type are available for limited numbers of countries and restrict the degrees of freedom in our regressions. For this reason, we employ two indicators from the Doing Business dataset, one representing infrastructure performance, “time to get electricity,” and the other the cost of entry for firms, “minimum paid-in capital for starting a business as share of GDP per capita.” There are other indicators that we could have included in the regressions, but we need to keep the number of right-hand-side variables low, and these two seem to be representative and to show stronger associations with labor allocation than the others. A reassuring aspect of these two variables (and some other alternatives that we left out) is that they tend to lower small firm formation, which is what one expects from factors that raise the cost of entry. Indeed, this view is confirmed by the results Tables 3 and 4 for both women’s and men’s labor allocation. These effects, however, do not help explain the lower share of female-owned small firms in MENA because the “time to get electricity” in MENA is shorter than in other regions, while “paid-in capital” is higher. The effects are small and cancel each other.

It noteworthy that in the case of “paid-in capital,” since the barrier to entry does not affect larger firms, the probability of medium/large firm formation by both women and men go up as the barrier rises. There also a shift toward self-employment for men and toward full-time employment for women. Interestingly, LFP of women also seems to rise somewhat. The infrastructure indicator, “time to get electricity,” tend to raise the costs for all firms and is associated with more retirement for women and higher unemployment for men.

The last indicator of business environment we examine here is the indicator of ease of foreign trade (obtained from Freedom of the World dataset).<sup>9</sup> The outcome is consistent with the results of other studies of trade and employment: Greater access to international markets tends to enable firms to grow larger and create more full-time employment opportunities for both men and women in significant ways, thus encouraging LFP. The latter effect is especially strong for women, though it is a combination of a large reduction in homemaking and some increase in retirement share. For men, the main shift is from part-time employment and small firm ownership towards medium/large firm ownership, full-time employment and, oddly, unemployment. Trade barriers are on average tangibly higher (by about 1.5 standard deviations) in MENA countries than in the rest of the world (see Table 2). This accounts for over 7 percentage points higher homemaking and almost 8 percentage points lower employment share for women in the region (Table 5).

### ***5.3 Labor market policies and labor allocation***

We now turn to the role of labor market policies and rules. The first variable of this type is the legal minimum wage relative to GDP per capita in 2008, obtained from the Doing Business dataset. The estimated impact of this variable on unemployment is consistent with simple economic models of labor market: higher minimum wages tend to raise the unemployment rate. One standard

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<sup>9</sup> Using openness or the share of exports in GDP and controlling for country size yields results that are by and large similar to those obtained with the trade freedom index.

deviation increase in the minimum wage relative to GDP per capita raises the probability of unemployment by about 2 percent for both men and women. Higher minimum wage is also associated with increases in retirement rates for men and women (by about 1 percent for one standard deviation increase). For men, there is also negative effects on self-employment and medium/large firm ownership. For women, the higher minimum wage seems to enable them to end up with more full-time employment. The mechanism appears to be through encouragement for greater LFP, but the coefficient estimate is not statistically very significant. Regarding the differences between MENA and non-MENA countries, minimum wages are relatively higher in MENA, but the overall effect is not very large to explain much of the existing gaps (Table 5).

The next three indicator of labor regulation that we use in our regressions are from the World Bank's Employing Workers dataset. The first one is a measure of protection of more established workers; a dummy that equals one when there are priority rules that apply to redundancy dismissals or lay-offs, such as seniority rules. The results are partly predictable, but the details are interesting (see Tables 3 and 4): They indicate that this type of regulation is associated with higher full-time employment for both men and women by about the same amounts (about 7 percentage points for adopting the regulation). For women, the shift come largely from reduced homemaking, though small/medium firm formation also declines somewhat. For men, the effect is mainly associated with moves away from self-employment and student positions. We also include in the regression the dummy for priority rules applying to re-employment to assess its difference with the indicator of layoff priority rules. This factor seems to diminish the probabilities of employment outcomes for men and women, with some shift from homemaking to retirement. The average difference between MENA and non-MENA countries regarding redundancy and reemployment priority rules is small and does not explain much of the divergences in their female labor allocation (Table 5). However, it is notable that all countries in North Africa plus Lebanon have such formal rules, while it is absent in the rest of the region.

Another measure of labor market protection that proved relevant and significant in our analysis was the requirement that the employer notifies or consults a third party prior to a collective dismissal. The main association of this factor with labor allocation is increased homemaking and reduced full-time employment and retirement shares among women. The implication for the MENA/non-MENA gap in these respects is small (about 1 percentage points per Table 5).

Finally, we consider the indicators of support for childcare, which should help women's employment more than men's, given the common pattern of responsibility assignment in households (Fong and Lokshin, 2006). Several variables of this type are available from the WBL dataset and among them, the most relevant seems to be the indicator of laws mandating paid or unpaid parental leave.<sup>10</sup> The presence of such laws is associated with increased female full-time employment and retirement shares (11 and 1.4 percentage points, respectively), but reduced part-time and self-employment among women (7 and 2 percentage points, respectively), with little impact on the homemaking rate. No MENA country has a parental leave mandate, while 43 percent of the countries outside MENA do. Thus, this difference accounts for about 5 percentage points of the 12 point full-time employment gap of MENA vs. non-MENA countries (Table 5). For men, the effect is a small shift from part-time employment into unemployment and student positions.

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<sup>10</sup> Maternal leave rules by themselves don't seem to help the same way as parental leave mandate because their asymmetric nature tend to reduce demand for female labor and, thereby, cancel out the benefits that they may bring to women in the labor force.

We conclude this section by highlighting the variables that turn out to be most closely connected with the variations of female homemaking, full-time employment, and small business ownership rates across countries (based on Table 6) and then recapping the factors that seems to matter most in explaining the labor allocation differences between MENA and non-MENA countries (based on Table 5). According to the first column of Table 6, the biggest source of variation in the homemaking rate across countries is differences in government effectiveness, followed by GDP per capita, share of resource rents, share of agriculture, joint legal responsibility of family expenses, trade freedom, and female vs. male education. For the share of full-time employment of women, the major drivers are government effectiveness, trade freedom, parental leave mandate, share of agriculture, priority rules in redundancy dismissals, and minimum paid-in capital. Finally, for variation in small firm formation by women, the key factors seem to be share of agriculture, GDP per capita, share of resource rents, female schooling, joint legal responsibility of family expenses, and time to get electricity.

For explaining the difference in LFP rates (sum of homemaking, retirement, and student shares) between MENA and non-MENA countries, the dominance of Muslim population, low government effectiveness, and the lack of joint legal responsibility rule for family expenses turn out to be the most important correlates, followed by the larger gap in female schooling and greater trade restrictions. The importance of resource rents, higher business startup barriers, and the lower average GDP per capita are also important for the MENA region, but work in the opposite direction and help raise female LFP. The region's gap in full-time employment among women is most closely related to trade restrictions, absence of parental leave mandate, low government effectiveness, travel limitations for married women, and women's schooling gap. Relatively low female education, absence of joint legal responsibility of family expenses, and high startup barriers prove to be the most important factors associated with low small firm formation by women in MENA. Natural resource rents seem to have helped such firms counteract with the constraints to some extent.

## **6. Conclusion**

A great deal of research on the role of gender in labor markets focuses on the determinants of women's labor force participation and its impact on the economy. However, there is far less work examining this choice along with the other alternatives that individuals face in allocating their labor and the roles that the economic and institutional environments of the country play in the outcome. Such research is particularly important for more comprehensive assessment of how institutional design and business and labor market policies affect labor allocation and economic performance. In this paper, we have taken a step in filling this gap by employing a large, micro-level, cross-country dataset that allows us to identify the impact of country characteristics and policies on labor allocation probabilities, while allowing for nine different alternatives and controlling for individual gender, age, and education characteristics.

While our regressions produce a variety of results regarding the association of country conditions with labor allocation, some findings stand out. Effective government turns out to be one of the most important factors correlated with female LFP and employment. Lowered foreign trade costs do more or less the same. In contrast to some studies that suggest that natural resource rents reduce female LFP, we find that the opposite is true, as the expansion in the economy's the fiscal and financial resources facilitates self-employment and firm ownership by women. The share of agriculture and the schooling of women relative to men are also associated with increased female LFP, employment, and firm ownership, though for very different reasons. Prevalence of Islamic

culture proves to be a predictor of low female LFP, as has been observed in many other studies (Pastore and Tenaglia, 2013). However, we trace most of this effect to traditions that are not necessarily Islamic and assign the legal responsibility for family expenses to male breadwinners, a phenomenon which is mostly observed in MENA countries, though not in all Islamic societies. Another related tradition with similar consequences is the legal rules preventing women to travel outside the country the same way as men do.

In addition to the macro factors influencing labor allocation, our analysis incorporates labor protection policies as well. We find that the connections between such measures and labor allocation are complex and vary for men and women. Some labor market policies such as the requirement that the employer notifies or consults a third party prior to workers' dismissal tend to reduce employment opportunities for women and discourage their LFP, while having little impact on men's labor allocation. However, priority rules that apply to redundancy dismissals or lay-offs achieve the opposite for both men and women. Some rules, as in the case of minimum wage, increase the employment rate for women at the cost of higher unemployment rates for both genders. Other rules, such as laws mandating paid or unpaid parental leave, shift labor allocation between types of employment (from part-time and self-employment to full-employment for women), without much impact on LFP. On the whole, labor protection policies seem to be more beneficial for the labor market activity of women, who face multiple constraints at home and in the marketplace. Women are typically the primary caregivers of their families and without adjustments in their employment conditions face major barriers to labor market participation or double day work. Under such conditions, some forms of labor protection may make jobs more attractive to workers and help better employment matches to form. It may be argued that if indeed such rules are helpful in employment relationships, businesses should be adopting them voluntarily rather than waiting for the government to impose them. However, this view ignores the need for coordination of beliefs and commitment to the required practices, which may be weak when the rules are not adopted at the societal level.

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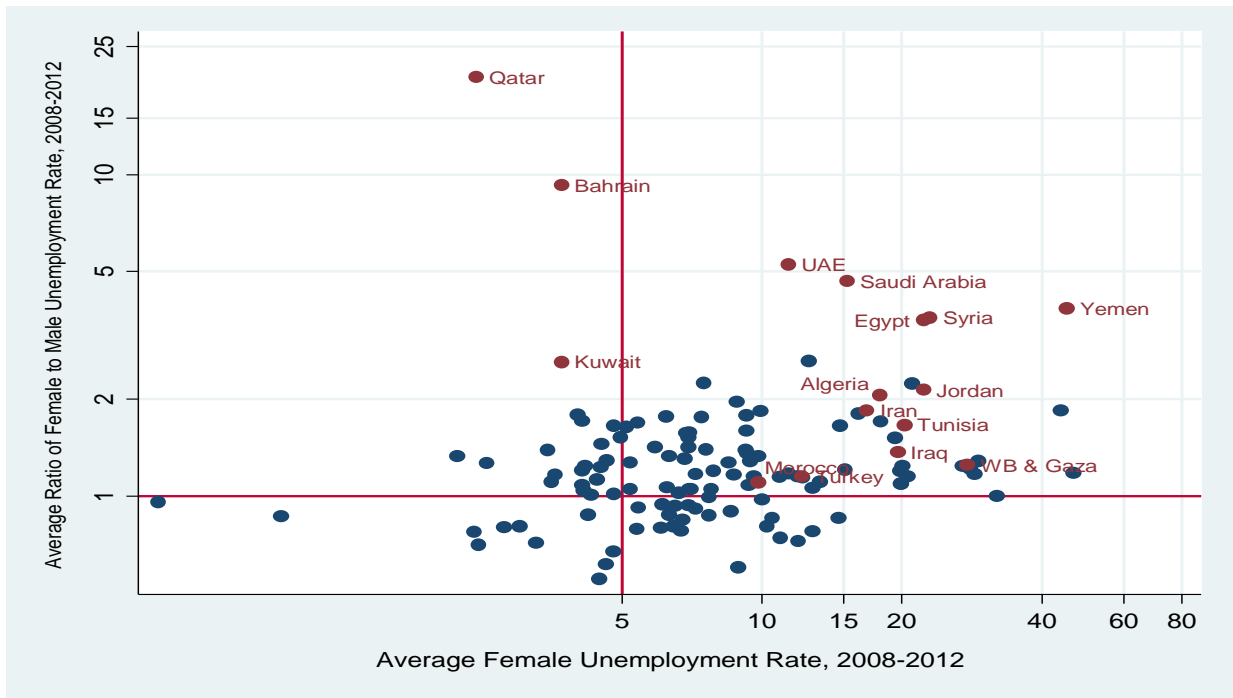


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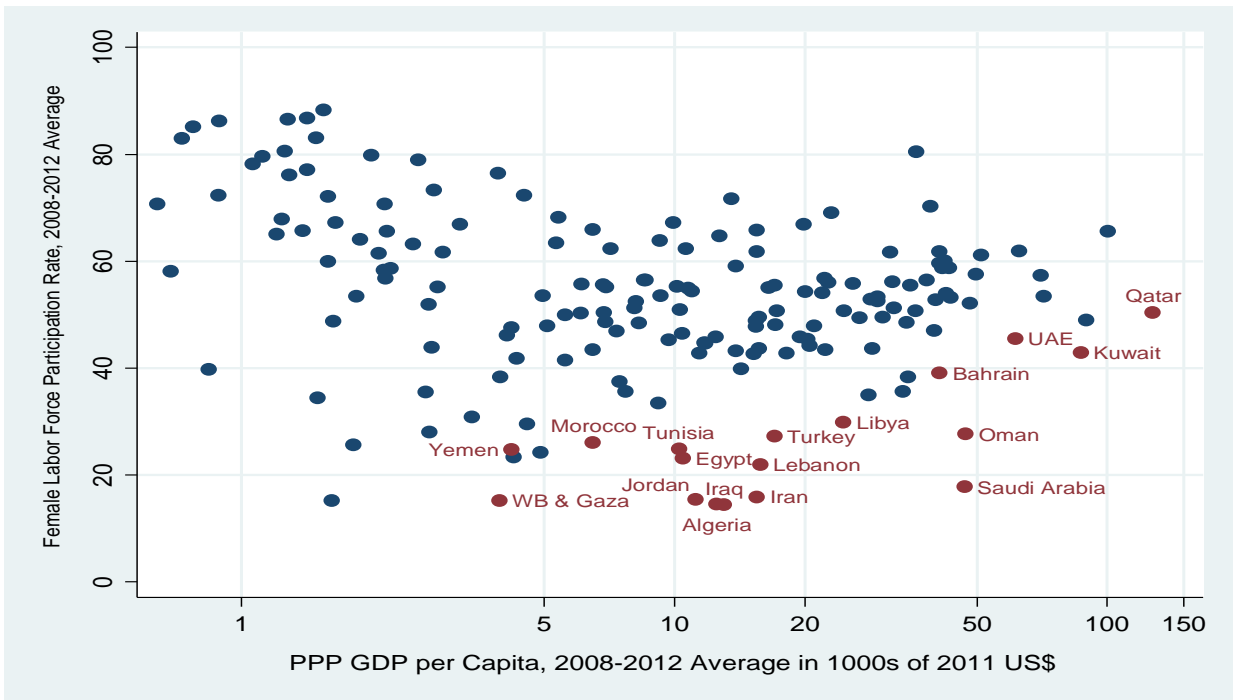
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**Figure 1: Women’s Labor Force Participation and Unemployment Rates across Countries**



Source: The World Bank, *World Development Indicators*, 2014.

**Figure 2: Female Labor Force Participation Rate and GDP Per Capita across Countries**



Source: The World Bank, *World Development Indicators*, 2014.

**Table 1: Differences in the Shares of Labor Allocation Alternatives and Marginal Probability Effects in MENA and Non-MENA Countries**

<b>Labor Allocation Alternatives</b>	<b>Differences in Labor Allocation Shares</b>	<b>Differences in Marginal Probability Effects</b>	<b>Reduction in Share Difference between</b>
Women			
Homemaker	0.338	0.322	0.016
Retired	-0.064	-0.026	-0.038
Student	0.038	0.012	0.026
Unemployed	-0.026	-0.039	0.013
Part-Time Employee	-0.065	-0.064	-0.001
Full-Time Employee	-0.137	-0.126	-0.011
Self-Employed	-0.023	-0.020	-0.003
Small Firm Owner/Employer	-0.061	-0.059	-0.002
Medium/Large Firm Owner/Employer	-0.001	0.000	-0.001
Men			
Homemaker	-0.014	-0.013	-0.001
Retired	-0.032	0.005	-0.037
Student	0.032	0.010	0.022
Unemployed	0.006	-0.009	0.015
Part-Time Employee	0.024	0.018	0.006
Full-Time Employee	-0.048	-0.057	0.009
Self-Employed	0.006	0.009	-0.003
Small Firm Owner/Employer	0.016	0.023	-0.007
Medium/Large Firm Owner/Employer	0.010	0.014	-0.004

Source: Authors' calculations based on GEM dataset.

**Table 2: Summary Statistics of Right-Hand-Side Variables Included in Cross-Country Regressions**

Explanatory Variables	53 Non-MENA Countries				12 MENA Countries			
	Mean	Std. Dev.	Min.	Max.	Mean	Std. Dev.	Min.	Max.
Log of PPP GDP per capita in 2005 prices	9.793	0.835	7.162	11.045	9.500	0.769	8.342	11.022
Log of PPP GDP per capita in 2005 prices squared	96.580	15.776	51.289	121.994	90.793	15.011	69.582	121.492
Log of average years of schooling of women	2.128	0.355	0.933	2.576	1.545	0.627	-0.163	2.248
Log of average years of schooling of men	2.223	0.254	1.448	2.578	1.885	0.309	1.073	2.233
Share of agriculture in GDP	0.067	0.066	0.001	0.328	0.090	0.053	0.011	0.189
Share of natural resource rents in GDP	0.059	0.117	0.000	0.747	0.192	0.177	0.000	0.501
Share of Muslims in total population	0.072	0.172	0.001	0.964	0.925	0.117	0.613	0.999
Dummy indicating married women can travel outside the country in the same way as men	1.000	0.000	1.000	1.000	0.750	0.452	0.000	1.000
Dummy for joint legal responsibility of married couples for financial maintenance of family expenses	0.962	0.192	0.000	1.000	0.417	0.515	0.000	1.000
WGI government effectiveness indicator	0.611	0.993	-1.274	2.246	-0.216	0.539	-1.046	0.809
Time to get electricity (years)	0.293	0.197	0.047	0.808	0.207	0.102	0.097	0.439
Minimum paid-in capital for starting a business (share of GDP per capita)	0.509	1.219	0.000	7.381	8.630	13.396	0.018	46.364
Trade freedom index (scaled to 0-1 range)	0.766	0.075	0.594	0.925	0.636	0.122	0.410	0.809
Minimum wage as a ratio of GDP per capita	0.299	0.192	0.000	1.014	0.362	0.278	0.000	0.848
Dummy for priority rules that apply to redundancy dismissals or lay-offs	0.365	0.482	0.000	1.000	0.417	0.515	0.000	1.000
Dummy for priority rules applying to re-employment	0.333	0.471	0.000	1.000	0.500	0.522	0.000	1.000
Dummy for requirement that the employer notifies or consults a third party prior to a collective dismissal	0.535	0.499	0.000	1.000	0.750	0.452	0.000	1.000
Dummy for laws mandating paid or unpaid parental leave	0.434	0.500	0.000	1.000	0.000	0.000	0.000	0.000

Source: Authors' calculations based on GEM dataset.

**Table 3: Explaining the Marginal Probability Effects of Country Conditions for Female Labor Allocation: Dependent Variables: Marginal Probability Changes of *Female* Labor Allocation Alternatives Due to Country Fixed Effects**

Explanatory Variables	Home-maker	Retired	Student	Unemployed	Part-Time Employee	Full-Time Employee	Self-Employed	Small Firm Owner	Medium/ Large Firm Owner
Log of PPP GDP per capita in 2005 prices	-0.493** (0.230)	0.254** (0.102)	0.113 (0.114)	0.238 (0.176)	-0.067 (0.131)	0.622*** (0.213)	-0.147 (0.114)	-0.491*** (0.176)	-0.028* (0.016)
Log of PPP GDP per capita in 2005 prices squared	0.031** (0.013)	-0.014*** (0.005)	-0.006 (0.006)	-0.015 (0.010)	0.006 (0.008)	-0.033*** (0.011)	0.007 (0.006)	0.023** (0.009)	0.002** (0.001)
Log of average years of schooling of women	-0.240** (0.101)	0.033 (0.027)	-0.023 (0.036)	0.022 (0.080)	-0.177** (0.073)	0.255*** (0.089)	0.032 (0.034)	0.090** (0.045)	0.009** (0.004)
Log of average years of schooling of men	0.214* (0.118)	0.040 (0.039)	-0.027 (0.048)	0.089 (0.117)	0.151 (0.098)	-0.344*** (0.105)	-0.032 (0.057)	-0.075 (0.069)	-0.014** (0.006)
Share of agriculture in GDP	-0.809** (0.375)	0.107 (0.111)	-0.271 (0.167)	-0.271 (0.265)	-0.163 (0.199)	0.660** (0.296)	-0.018 (0.136)	0.705* (0.414)	0.061*** (0.015)
Share of natural resource rents in GDP	-0.524*** (0.107)	0.078** (0.033)	0.008 (0.072)	0.051 (0.078)	-0.081 (0.090)	0.182 (0.137)	0.091** (0.037)	0.182*** (0.058)	0.014*** (0.005)
Share of Muslims in total population	0.111* (0.057)	0.038** (0.017)	-0.007 (0.029)	0.038 (0.055)	-0.090*** (0.027)	-0.009 (0.044)	-0.051** (0.025)	-0.036 (0.032)	0.007*** (0.003)
Dummy indicating married women can travel outside the country in the same way as men	-0.101* (0.061)	0.008 (0.018)	-0.033 (0.039)	-0.004 (0.040)	-0.051 (0.046)	0.135** (0.057)	0.049*** (0.017)	-0.012 (0.032)	0.009*** (0.003)
Dummy for joint legal responsibility of married couples for financial maintenance of family expenses	-0.204*** (0.058)	0.035* (0.019)	0.015 (0.017)	0.040 (0.033)	0.050** (0.025)	-0.032 (0.046)	-0.000 (0.012)	0.089*** (0.027)	0.007*** (0.002)
WGI government effectiveness indicator	-0.136*** (0.024)	0.009 (0.008)	0.012 (0.009)	0.005 (0.022)	0.043** (0.018)	0.057*** (0.020)	-0.011 (0.013)	0.020 (0.015)	0.000 (0.001)
Time to get electricity (years)	-0.087 (0.076)	0.061*** (0.020)	0.078 (0.079)	0.006 (0.050)	0.050 (0.042)	0.017 (0.047)	-0.019 (0.020)	-0.109*** (0.029)	0.003 (0.003)
Minimum paid-in capital for starting a business (share of GDP per capita)	-0.007*** (0.002)	0.001** (0.001)	0.001 (0.001)	-0.001 (0.001)	0.000 (0.001)	0.007*** (0.001)	-0.000 (0.001)	-0.003*** (0.001)	0.000** (0.000)
Trade freedom index (scaled to 0-1 range)	-0.571*** (0.217)	0.175** (0.069)	0.058 (0.070)	0.092 (0.198)	-0.106 (0.124)	0.602*** (0.178)	-0.571*** (0.217)	0.175** (0.069)	0.058 (0.070)
Minimum wage as a ratio of GDP per capita	-0.125 (0.089)	0.046** (0.020)	-0.050 (0.048)	0.098* (0.056)	0.009 (0.039)	0.097** (0.044)	-0.125 (0.089)	0.046** (0.020)	-0.050 (0.048)
Dummy for priority rules that apply to redundancy dismissals or lay-offs	-0.063** (0.030)	0.011 (0.010)	0.011 (0.016)	-0.021 (0.022)	0.028 (0.020)	0.076*** (0.026)	-0.063** (0.030)	0.011 (0.010)	0.011 (0.016)
Dummy for priority rules applying to re-employment	-0.051** (0.024)	0.023*** (0.008)	0.025* (0.014)	0.022 (0.021)	-0.049** (0.020)	0.023 (0.023)	-0.051** (0.024)	0.023*** (0.008)	0.025* (0.014)
Dummy for requirement that the employer notifies or consults a third party prior to a collective dismissal	0.049* (0.028)	-0.030*** (0.009)	-0.006 (0.010)	0.010 (0.017)	-0.000 (0.013)	-0.049*** (0.018)	0.049* (0.028)	-0.030*** (0.009)	-0.006 (0.010)
Dummy for laws mandating paid or unpaid parental leave	-0.024 (0.032)	0.014* (0.008)	-0.014 (0.026)	0.002 (0.022)	-0.068** (0.029)	0.112*** (0.029)	-0.024 (0.032)	0.014* (0.008)	-0.014 (0.026)
Constant	2.770** (1.090)	-1.515*** (0.511)	-0.440 (0.484)	-1.292 (0.885)	0.280 (0.597)	-3.370*** (1.054)	2.770** (1.090)	-1.515*** (0.511)	-0.440 (0.484)
Number of Observations	65	65	65	65	65	65	65	65	65

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

**Table 4: Explaining the Marginal Probability Effects of Country Conditions for Female Labor Allocation: Dependent Variables: Marginal Probability Changes of *Male* Labor Allocation Alternatives Due to Country Fixed Effects**

Explanatory Variables	Home-maker	Retired	Student	Unemployed	Part-Time Employee	Full-Time Employee	Self-Employed	Small Firm Owner	Medium/ Large Firm Owner
Log of PPP GDP per capita in 2005 prices	-0.152*** (0.053)	0.126 (0.093)	0.019 (0.055)	0.415*** (0.142)	-0.005 (0.090)	0.378* (0.226)	-0.174 (0.168)	-0.545*** (0.211)	-0.063* (0.037)
Log of PPP GDP per capita in 2005 prices squared	0.009*** (0.003)	-0.007 (0.005)	-0.001 (0.003)	-0.025*** (0.008)	0.002 (0.005)	-0.014 (0.013)	0.008 (0.009)	0.025** (0.012)	0.004* (0.002)
Log of average years of schooling of women	-0.018 (0.017)	0.009 (0.033)	-0.044** (0.021)	-0.037 (0.042)	-0.098*** (0.031)	-0.093 (0.094)	0.091 (0.058)	0.147** (0.062)	0.043*** (0.013)
Log of average years of schooling of men	0.035 (0.025)	0.067 (0.041)	0.061** (0.029)	0.123* (0.067)	0.028 (0.043)	-0.007 (0.124)	-0.103 (0.094)	-0.147 (0.095)	-0.056*** (0.018)
Share of agriculture in GDP	0.247** (0.124)	-0.101 (0.136)	-0.128* (0.072)	-0.337 (0.215)	-0.233* (0.133)	0.135 (0.310)	-0.190 (0.230)	0.457* (0.275)	0.150*** (0.045)
Share of natural resource rents in GDP	-0.004 (0.019)	0.016 (0.029)	0.057*** (0.020)	0.043 (0.052)	-0.105*** (0.040)	-0.123 (0.133)	0.063 (0.060)	0.020 (0.092)	0.033* (0.019)
Share of Muslims in total population	-0.025** (0.012)	0.042** (0.019)	0.011 (0.013)	0.074** (0.037)	-0.091*** (0.026)	-0.083 (0.055)	-0.013 (0.045)	0.056 (0.050)	0.030*** (0.009)
Dummy indicating married women can travel outside the country in the same way as men	0.010 (0.008)	-0.014 (0.028)	0.014 (0.026)	-0.043 (0.026)	-0.030 (0.032)	0.040 (0.122)	0.079** (0.033)	-0.071 (0.056)	0.014 (0.011)
Dummy for joint legal responsibility of married couples for financial maintenance of family expenses	0.000 (0.009)	0.010 (0.020)	0.011 (0.010)	0.022 (0.034)	-0.036 (0.025)	-0.135** (0.052)	0.010 (0.021)	0.107*** (0.038)	0.010 (0.008)
WGI government effectiveness indicator	-0.006 (0.005)	-0.001 (0.009)	0.005 (0.007)	0.012 (0.014)	-0.011 (0.011)	0.003 (0.029)	-0.019 (0.024)	0.020 (0.023)	-0.001 (0.004)
Time to get electricity (years)	0.001 (0.012)	0.020 (0.021)	-0.036*** (0.011)	0.101** (0.047)	0.011 (0.040)	0.050 (0.052)	-0.012 (0.034)	-0.135*** (0.050)	-0.001 (0.008)
Minimum paid-in capital for starting a business (share of GDP per capita)	-0.000 (0.000)	-0.000 (0.001)	-0.000 (0.001)	-0.001 (0.001)	-0.002*** (0.001)	0.004 (0.003)	0.003** (0.001)	-0.004*** (0.001)	0.001*** (0.000)
Trade freedom index (scaled to 0-1 range)	-0.076* (0.040)	0.076 (0.065)	-0.013 (0.043)	0.283** (0.117)	-0.291*** (0.111)	0.484* (0.271)	-0.076* (0.040)	0.076 (0.065)	-0.013 (0.043)
Minimum wage as a ratio of GDP per capita	-0.011 (0.010)	0.042** (0.018)	0.015 (0.012)	0.093** (0.037)	0.005 (0.034)	-0.032 (0.072)	-0.011 (0.010)	0.042** (0.018)	0.015 (0.012)
Dummy for priority rules that apply to redundancy dismissals or lay-offs	-0.009* (0.005)	0.006 (0.008)	-0.012** (0.006)	-0.010 (0.016)	0.015 (0.011)	0.073*** (0.026)	-0.009* (0.005)	0.006 (0.008)	-0.012** (0.006)
Dummy for priority rules applying to re-employment	0.009* (0.005)	0.013 (0.008)	0.010* (0.006)	-0.003 (0.016)	-0.023** (0.011)	-0.044* (0.024)	0.009* (0.005)	0.013 (0.008)	0.010* (0.006)
Dummy for requirement that the employer notifies or consults a third party prior to a collective dismissal	0.007 (0.005)	-0.010 (0.009)	-0.001 (0.006)	-0.010 (0.013)	0.007 (0.009)	-0.012 (0.019)	0.007 (0.005)	-0.010 (0.009)	-0.001 (0.006)
Dummy for laws mandating paid or unpaid parental leave	-0.005 (0.004)	0.008 (0.009)	0.012** (0.006)	0.031* (0.017)	-0.035** (0.014)	0.005 (0.027)	-0.005 (0.004)	0.008 (0.009)	0.012** (0.006)
Constant	0.645** (0.277)	-0.779* (0.466)	-0.147 (0.261)	-2.066*** (0.786)	0.368 (0.418)	-2.389** (1.021)	0.645** (0.277)	-0.779* (0.466)	-0.147 (0.261)
Number of Observations	65	65	65	65	65	65	65	65	65

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



**Table 5: Explaining the Gaps of Female Labor Allocation in MENA and non-MENA Countries: Percentage Points Accounted for by the Differences in Each Factor between MENA and Non-MENA Countries**

Explanatory Variables	Home-maker	Retired	Student	Unemployed	Part-Time Employee	Full-Time Employee	Self-Employed	Small Firm Owner	Medium/Large Firm Owner
Log of PPP GDP per capita in 2005 prices	14.4	-7.4				-18.2		14.4	0.8
Log of PPP GDP per capita in 2005 prices squared	-17.9	8.1				19.1		-13.3	-1.2
Log of average years of schooling of women	14.0				10.3	-14.9		-5.2	-0.5
Log of average years of schooling of men	-7.2					11.6			0.5
Share of agriculture in GDP	-1.9					1.6		1.7	0.1
Share of natural resource rents in GDP	-7.0	1.0					1.2	2.4	0.2
Share of Muslims in total population	9.5	3.2				-7.7	-4.3		0.6
Dummy indicating married women can travel outside the country in the same way as men	2.5					-3.4	-1.2		-0.2
Dummy for joint legal responsibility of married couples for financial maintenance of family expenses	11.1	-1.9				-2.7		-4.9	-0.4
WGI government effectiveness indicator	11.2					-3.6	-4.7		
Time to get electricity (years)		-0.5						0.9	
Minimum paid-in capital for starting a business (share of GDP per capita)	-5.7	0.8					5.7	-2.4	0.0
Trade freedom index (scaled to 0-1 range)	7.4	-2.3					-7.8		
Minimum wage as a ratio of GDP per capita		0.3		0.6		0.6			
Dummy for priority rules that apply to redundancy dismissals or lay-offs	-0.3					0.4			0.0
Dummy for priority rules applying to re-employment	-0.9	0.4	0.4			-0.8			
Dummy for requirement that the employer notifies or consults a third party prior to a collective dismissal	1.1	-0.6				-1.1			
Dummy for laws mandating paid or unpaid parental leave		-0.6				3.0	-4.9	0.9	
<b>Sum of Percentage Points Changes Due to All Variable Gaps</b>	<b>30.4</b>	<b>0.5</b>	<b>0.4</b>	<b>0.6</b>	<b>-1.5</b>	<b>-15.9</b>	<b>-3.5</b>	<b>-6.5</b>	<b>-0.1</b>
<b>Differences in Marginal Probability Effects (MENA minus Non-MENA)</b>	<b>32.2</b>	<b>-2.6</b>	<b>1.2</b>	<b>-3.9</b>	<b>-6.4</b>	<b>-12.6</b>	<b>-2.0</b>	<b>-5.9</b>	<b>0.0</b>

**Table 6: The Percentage Point Change in Female Labor Allocation Associated with One Standard Deviation Rise in the Right-Hand-Side Variables**

Explanatory Variables	Home-maker	Retired	Student	Unemployed	Part-Time Employee	Full-Time Employee	Self-Employed	Small Firm Owner	Medium/Large Firm Owner
Log of PPP GDP per capita in 2005 prices	-40.6	20.9				51.2		-40.4	-2.3
Log of PPP GDP per capita in 2005 prices squared	48.5	-21.9				-51.6		36.0	3.1
Log of average years of schooling of women	-9.7				-7.2	10.3		3.6	0.4
Log of average years of schooling of men	5.7					-9.1			-0.4
Share of agriculture in GDP	-5.2					4.2		4.5	0.4
Share of natural resource rents in GDP	-6.7	1.0					1.2	2.3	0.2
Share of Muslims in total population	1.8	0.6			-1.5		-0.8		0.1
Dummy indicating married women can travel outside the country in the same way as men	-0.8					1.1	0.4		0.1
Dummy for joint legal responsibility of married couples for financial maintenance of family expenses	-5.1	0.9			1.3			2.2	0.2
WGI government effectiveness indicator	-12.4				3.9	5.2			
Time to get electricity (years)		1.1						-2.0	
Minimum paid-in capital for starting a business (share of GDP per capita)	-2.4	0.3				2.4		-1.0	0.0
Trade freedom index (scaled to 0-1 range)	-4.8	1.5				5.0			
Minimum wage as a ratio of GDP per capita		1.0		2.0		2.0			
Dummy for priority rules that apply to redundancy dismissals or lay-offs	-3.1					3.7			-0.1
Dummy for priority rules applying to re-employment	-2.5	1.1	1.2		-2.4				
Dummy for requirement that the employer notifies or consults a third party prior to a collective dismissal	2.4	-1.5				-2.4			
Dummy for laws mandating paid or unpaid parental leave		0.6			-2.8	4.6	-0.9		
Sum of Percentage Point Change Due to One Standard Deviation Increase in All Variables	-34.9	5.6	1.2	2.0	-8.6	26.7	-0.1	5.3	1.6

## Appendix

**Table A1: Country-Level Shares of Labor Allocation Alternatives by Gender: MENA vs. Other Countries (Percent of Total for Each Gender in Each Country)**

Labor Allocation Alternatives	61 Non-MENA Countries				13 MENA Countries			
	Mean	Std. Dev.	Min.	Max.	Mean	Std. Dev.	Min.	Max.
<b>Women</b>								
Homemaker	21.5	15.2	0.3	84.2	55.3	15.3	29.8	73.2
Retired	8.9	7.1	0.2	30.6	2.5	2.3	0.0	9.0
Student	4.9	6.0	0.2	47.6	8.7	4.5	3.1	18.3
Unemployed	8.4	7.0	0.2	34.5	5.8	3.5	1.8	12.7
Part-Time Employee	10.7	8.3	1.6	36.9	4.2	2.6	1.6	9.5
Full-Time Employee	29.8	13.9	4.7	58.6	16.1	9.8	4.2	36.3
Self-Employed	4.1	5.2	0.0	21.9	1.8	1.0	0.5	3.5
Small Firm Owner/Employer	11.0	11.4	0.6	58.4	4.9	4.0	0.0	12.8
Medium/Large Firm Owner/Employer	0.7	0.5	0.0	2.6	0.6	0.7	0.0	2.3
<b>Men</b>								
Homemaker	1.9	3.7	0.0	20.6	0.5	0.3	0.2	1.2
Retired	9.3	6.1	0.6	26.9	6.1	4.3	0.2	13.2
Student	4.3	2.4	0.6	12.1	7.5	4.0	1.9	16.8
Unemployed	9.3	6.4	0.5	31.9	9.9	6.4	1.7	22.7
Part-Time Employee	6.9	4.8	0.7	23.9	9.4	6.7	2.1	26.6
Full-Time Employee	44.4	13.8	10.3	65.3	39.6	17.1	11.8	75.6
Self-Employed	6.5	7.2	0.0	39.3	7.1	5.5	1.2	20.7
Small Firm Owner/Employer	15.5	11.3	0.6	56.8	17.1	11.2	0.1	37.4
Medium/Large Firm Owner/Employer	1.9	1.2	0.1	5.5	2.9	2.3	0.1	8.6

Source: Authors' calculations based on GEM dataset.

**Table A2: Summary of Country-Level Means of the Individual Characteristics Used in Probit Regressions**

Explanatory Variables	Mean	61 Non-MENA Countries			13 MENA Countries			
		Std. Dev.	Min.	Max.	Mean	Std. Dev.	Min.	Max.
<b>Women's Characteristics</b>								
Ages 20-29 Dummy	0.231	0.103	0.093	0.533	0.366	0.064	0.241	0.483
Ages 30-39 Dummy	0.244	0.047	0.155	0.339	0.277	0.033	0.213	0.331
Ages 40-49 Dummy	0.226	0.040	0.116	0.323	0.199	0.024	0.158	0.241
Ages 50-59 Dummy	0.188	0.061	0.043	0.297	0.119	0.038	0.061	0.205
Ages 60-69 Dummy	0.110	0.061	0.016	0.249	0.039	0.020	0.008	0.076
Some Secondary Education	0.179	0.113	0.000	0.445	0.208	0.099	0.049	0.331
Secondary Education	0.337	0.140	0.061	0.644	0.282	0.107	0.102	0.454
Post-Secondary Education	0.282	0.173	0.021	0.878	0.256	0.177	0.040	0.773
Graduate Education	0.036	0.066	0.000	0.347	0.021	0.044	0.000	0.162
All Other Education Categories	0.165	0.204	0.000	1.017	0.234	0.163	0.008	0.595
<b>Men's Characteristics</b>								
Ages 20-29 Dummy	0.240	0.089	0.094	0.517	0.373	0.060	0.292	0.499
Ages 30-39 Dummy	0.232	0.042	0.155	0.325	0.264	0.040	0.219	0.351
Ages 40-49 Dummy	0.224	0.031	0.142	0.302	0.185	0.027	0.118	0.227
Ages 50-59 Dummy	0.188	0.051	0.049	0.291	0.132	0.036	0.085	0.217
Ages 60-69 Dummy	0.116	0.060	0.020	0.271	0.047	0.020	0.015	0.079
Some Secondary Education	0.176	0.116	0.000	0.439	0.216	0.114	0.070	0.410
Secondary Education	0.359	0.144	0.095	0.699	0.312	0.146	0.141	0.727
Post-Secondary Education	0.288	0.169	0.025	0.836	0.284	0.169	0.050	0.724
Graduate Education	0.040	0.068	0.000	0.392	0.027	0.040	0.000	0.151
All Other Education Categories	0.137	0.174	0.000	0.885	0.161	0.128	0.008	0.422

**Table A3: Multinomial Probit Model of Female Labor Allocation†**

Explanatory Variables	Age, Education, and Female Labor Allocation Alternatives: Marginal Probability Effects Based on a Multinomial Probit Model with Country Fixed Effects								
	Home-maker	Retired	Student	Unemployed	Part-Time Employee	Full-Time Employee	Self-Employed	Small Firm Owner	Medium/ Large Firm Owner
Ages 30-39 Dummy	0.063*** (0.009)	-0.019** (0.007)	-0.099*** (0.006)	-0.039*** (0.005)	-0.001 (0.004)	0.037*** (0.008)	0.01*** (0.003)	0.044*** (0.005)	0.003*** (0.001)
Ages 40-49 Dummy	0.054*** (0.011)	0.012 (0.009)	-0.122*** (0.01)	-0.056*** (0.006)	0.004 (0.005)	0.033*** (0.009)	0.01*** (0.003)	0.061*** (0.005)	0.004*** (0.001)
Ages 50-59 Dummy	0.055*** (0.012)	0.089*** (0.009)	-0.126*** (0.01)	-0.057*** (0.007)	-0.018** (0.006)	-0.004 (0.01)	0.007** (0.003)	0.05*** (0.005)	0.004*** (0.001)
Ages 60-69 Dummy	0.096*** (0.015)	0.19*** (0.008)	-0.105*** (0.01)	-0.063*** (0.009)	-0.031*** (0.008)	-0.154*** (0.011)	0.008** (0.004)	0.053*** (0.006)	0.006*** (0.001)
Some Secondary Education	-0.075*** (0.012)	0.003 (0.005)	0.022** (0.009)	-0.001 (0.005)	0.007 (0.005)	0.059*** (0.011)	-0.005 (0.003)	-0.01* (0.005)	0.00 (0.001)
Secondary Education	-0.178*** (0.014)	0.002 (0.005)	0.056*** (0.012)	-0.012* (0.007)	0.012* (0.007)	0.143*** (0.013)	-0.007* (0.003)	-0.018*** (0.006)	0.003** (0.001)
Post-Secondary Education	-0.281*** (0.014)	0.001 (0.007)	0.044** (0.016)	-0.021*** (0.006)	0.016** (0.008)	0.247*** (0.014)	-0.005 (0.004)	-0.007 (0.008)	0.006*** (0.001)
Graduate Education	-0.37*** (0.024)	-0.007 (0.01)	0.045** (0.016)	-0.025** (0.012)	0.016 (0.011)	0.315*** (0.017)	0.007 (0.005)	0.012 (0.01)	0.008*** (0.002)
Other	-0.267*** (0.035)	-0.009 (0.012)	0.028** (0.014)	-0.015 (0.009)	0.003 (0.009)	0.236*** (0.026)	0.004 (0.005)	0.015 (0.012)	0.004 (0.002)
Number of Observations	167,590	167,590	167,590	167,590	167,590	167,590	167,590	167,590	167,590

Notes: †The model includes country dummies, which are used for assessing the marginal probabilities of country fixed effects. Standard errors are shown in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table A4: Multinomial Probit Model of Male Labor Allocation†**

Explanatory Variables	Age, Education, and Male Labor Allocation Alternatives: Marginal Probability Effects Based on a Multinomial Probit Model with Country Fixed Effects								
	Home-maker	Retired	Student	Unemployed	Part-Time Employee	Full-Time Employee	Self-Employed	Small Firm Owner	Medium/Large Firm Owner
Ages 30-39 Dummy	-0.007*** (0.004)	-0.006** (0.009)	-0.1*** (0.007)	-0.049*** (0.004)	-0.021 (0.003)	0.097*** (0.008)	0.012*** (0.003)	0.064*** (0.005)	0.009*** (0.002)
Ages 40-49 Dummy	-0.006*** (0.004)	0.039 (0.01)	-0.127*** (0.006)	-0.06*** (0.005)	-0.03 (0.004)	0.072*** (0.009)	0.011*** (0.003)	0.087*** (0.006)	0.015*** (0.002)
Ages 50-59 Dummy	-0.002*** (0.004)	0.112*** (0.01)	-0.12*** (0.008)	-0.053*** (0.006)	-0.03** (0.004)	-0.011 (0.009)	0.009** (0.004)	0.08*** (0.007)	0.015*** (0.001)
Ages 60-69 Dummy	0.005*** (0.004)	0.227*** (0.01)	-0.089*** (0.011)	-0.042*** (0.008)	-0.015*** (0.005)	-0.218*** (0.013)	0.014** (0.006)	0.101*** (0.007)	0.018*** (0.002)
Some Secondary Education	-0.008*** (0.002)	-0.002 (0.004)	0.034** (0.009)	-0.026 (0.006)	-0.013 (0.005)	0.027*** (0.009)	-0.01 (0.005)	-0.005* (0.006)	0.002 (0.002)
Secondary Education	-0.014*** (0.003)	-0.015 (0.005)	0.074*** (0.009)	-0.059* (0.006)	-0.024* (0.006)	0.079*** (0.012)	-0.026* (0.005)	-0.023*** (0.006)	0.008** (0.002)
Post-Secondary Education	-0.019*** (0.004)	-0.029 (0.006)	0.063** (0.009)	-0.08*** (0.006)	-0.029** (0.007)	0.132*** (0.015)	-0.028 (0.007)	-0.023 (0.009)	0.012*** (0.002)
Graduate Education	-0.026*** (0.003)	-0.044 (0.007)	0.064** (0.012)	-0.106** (0.011)	-0.033 (0.007)	0.177*** (0.017)	-0.034 (0.009)	-0.016 (0.016)	0.018*** (0.003)
Other	-0.017*** (0.004)	-0.031 (0.008)	0.056** (0.011)	-0.078 (0.015)	-0.022 (0.01)	0.112*** (0.02)	-0.02 (0.009)	-0.013 (0.017)	0.013 (0.007)
Number of Observations	154,387	154,387	154,387	154,387	154,387	154,387	154,387	154,387	154,387

Notes: †The model includes country dummies, which are used for assessing the marginal probabilities of country fixed effects. Standard errors are shown in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table A5: Summary Statistics of Average Marginal Probability Effects of Country by Gender: MENA vs. Other Countries**

Labor Allocation Alternatives	61 Non-MENA Countries				13 MENA Countries			
	Mean	Std. Dev.	Min.	Max.	Mean	Std. Dev.	Min.	Max.
<b>Women</b>								
Homemaker	-0.114	0.131	-0.330	0.387	0.208	0.127	0.000	0.407
Retired	-0.008	0.042	-0.072	0.118	-0.034	0.032	-0.082	0.034
Student	-0.036	0.050	-0.085	0.316	-0.025	0.029	-0.064	0.057
Unemployed	-0.011	0.070	-0.099	0.213	-0.050	0.029	-0.087	0.003
Part-Time Employee	0.063	0.084	-0.027	0.336	-0.001	0.028	-0.029	0.074
Full-Time Employee	0.057	0.121	-0.145	0.328	-0.069	0.080	-0.180	0.051
Self-Employed	-0.005	0.052	-0.045	0.194	-0.025	0.013	-0.040	0.000
Small Firm Owner/Employer	0.058	0.119	-0.049	0.552	-0.001	0.043	-0.056	0.091
Medium/Large Firm Owner/Employer	-0.005	0.005	-0.012	0.012	-0.004	0.006	-0.010	0.009
<b>Men</b>								
Homemaker	0.011	0.034	-0.008	0.189	-0.002	0.003	-0.006	0.004
Retired	-0.017	0.035	-0.091	0.087	-0.012	0.046	-0.086	0.064
Student	-0.035	0.021	-0.070	0.025	-0.025	0.024	-0.068	0.028
Unemployed	-0.019	0.065	-0.113	0.231	-0.028	0.057	-0.097	0.084
Part-Time Employee	0.007	0.045	-0.057	0.172	0.025	0.060	-0.042	0.168
Full-Time Employee	0.073	0.134	-0.248	0.275	0.016	0.153	-0.236	0.332
Self-Employed	-0.038	0.072	-0.102	0.290	-0.028	0.053	-0.090	0.102
Small Firm Owner/Employer	0.014	0.115	-0.135	0.429	0.037	0.111	-0.139	0.231
Medium/Large Firm Owner/Employer	0.002	0.010	-0.016	0.029	0.016	0.022	-0.004	0.073

Source: Authors' calculations derived from the multinomial probit model estimation using GEM dataset.