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Aggregate Costs of Gender Gaps in the Labor Market: A Quantitative Estimate

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Abstract: This paper examines the quantitative effects of gender gaps in entrepreneurship and labor force participation on aggregate productivity and income per capita. We simulate an occupational choice model with heterogeneous agents in entrepreneurial ability, where agents choose to be workers, self-employed or employers. The model assumes that men and women have the same talent distribution, but we impose several frictions on women's opportunities and pay in the labor market. In particular, we restrict the fraction of women participating in the labor market. Moreover, we limit the number of women who can work as employers or as self-employed and, finally, women who become workers receive a lower wage. Our model shows that gender gaps in entrepreneurship and in female workers' pay affect aggregate productivity negatively, while gender gaps in labor force participation reduce income per capita. Specifically, if all women are excluded from entrepreneurship, average output per worker drops by almost 12% because the average talent of entrepreneurs falls down, while if all women are excluded from the labor force income per capita is reduced by almost 40%. In the cross-country analysis, we find that gender gaps and their implied income losses differ importantly across geographical regions, with a total income loss of 27% in Middle East and North Africa and a 10% loss in Europe..

JEL Codes: E2, J21, J24, O40.

Keywords: Span of control, Aggregate productivity, Entrepreneurship talent, Gender inequality.

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1 Introduction

Although recent decades have witnessed a significant drop in gender gaps both in developed and developing countries, the prevalence of gender inequality is still high, especially in South Asia, the Middle East and North Africa.[1] These gaps are present in the labor market, where women typically receive lower wages, are underrepresented in certain occupations, and work fewer hours than men,[2] as well as in several other dimensions including education, access to productive inputs, political representation, or bargaining power inside the household.

One important aspect of gender inequality in the labor market that has not been much studied is the presence of women in entrepreneurial activities. The World Bank (2001) estimates that, in developed countries, the average incidence of females among employers is less than 30%. Everything else equal, a better use of women's potential in the labor market is likely to result in greater macroeconomic efficiency. When they are free to choose their occupation, for example, the most talented people - independently of their gender - typically organize production carried out by others, so they can spread their ability advantage over a larger scale. From this point of view, obstacles to women's access to entrepreneurship reduce the average ability of a country's entrepreneurs and affect negatively the way production is organized in the economy and, hence, its efficiency.[3]

In this paper, we develop and simulate an occupational choice model that illustrates the negative impact of gender inequality on resource allocation and thus on aggregate productivity and income per capita. The model is then used to quantify the costs of gender inequality in the labor market and the effects of the existing labor gender gaps in a large sample of both developed and developing countries. Our theoretical framework is an extension of the span-of-control model by Lucas (1978). The two new elements in our model are first the inclusion of a third occupation, namely self-employment, on top of employers and workers, as in Gollin (2008).[4] Secondly, we introduce several exogenous frictions that only affect women. In the model, agents are endowed with entrepreneurial talent drawn from a random distribution and choose their occupation.[5] Men are unrestricted in their choices, but the limits imposed to women's options in the labor market reduce aggregate productivity and income per capita

[1] See Klasen and Lamanna (2009).

[2] See for instance Blau and Kahn (2007, 2013).

[3] Elborgh-Waytek et al. (2013) also argue that gender inequality may have negative macroeconomic effects. Barsh and Yee (2012) claim that the employment of women on an equal basis would allow companies to make a better use of talent.

[4] Lucas uses the term "manager" rather than "employer" but we think in our model the latter helps clarifying the difference between an agent who runs a firm where other agents work (an employer) and an agent who run his or her own firm without any other worker (a self-employed).

[5] We abstract from the decision of agents to participate or not in the labor market, i.e. all agents would like to work unless they are banned to do so. Implicitly, we shut down, for example, the decision of whether one of the members of the household optimally chooses to stay out of the labor market. We choose to do so for simplicity, but also because there is no data on household's allocation of resources for a large sample of countries.

due to the associated inefficient allocation of talent across occupations.

The rest of the paper is organized as follows. In Section 2, we briefly discuss the existing papers linking labor gender inequality and economic growth, with an emphasis on those most closely related to our work. The theoretical model is presented in Section 3. Section 4 explains the model simulation and presents the main numerical results. Section 5 discusses the quantitative implications of our model for a large set of countries, and, finally, Section 6 concludes.

2 Literature Review

The empirical literature on the two-way relationship between economic growth and gender inequality is quite large.[6] This literature has reached some consensus on the fact that there is a positive effect of increases in income per capita on gender equality and, more relevant to our paper, a negative effect of gender inequality on economic growth.

In the theoretical literature, several studies focus on explaining the effects of economic growth on different gender gaps, for example, Becker and Lewis (1973), Galor and Weil (1996), Greenwood et al. (2005), Deopke and Tertilt (2009), Fernandez (2009) and Ngai and Petrongolo (2013). Other papers have focused on the reverse effect, i.e. the impact of gender inequality on growth. These theories are, in most cases, based on the fertility and children's human capital channels, as in Galor and Weil (1996), and Lagerlöf (2003).[7] Galor and Weil (1996), for example, argue that an increase in women's relative wage increases the cost of raising children, which lowers population growth, increases children's education levels and leads to higher labor productivity and growth. In our view, these theoretical papers could be extended in two directions: first, the models could be calibrated and simulated to produce reasonable estimates of the costs associated to specific gender gaps. Second, it is useful to explore the relevance of a relatively ignored mechanism through which gender inequality reduces aggregate productivity, namely, the female labor productivity channel.

With respect to the first suggested extension, there are very few recent theoretical papers that have been used to quantify the aggregate costs of gender inequality. Cavalcanti and Tavares (2011) construct a growth model based on Galor and Weil (1996) in which there is exogenous wage discrimination against women. When they calibrate their model using U.S. data, they find very large effects associated with these wage gaps: a 50 percent increase in the gender wage gap in their model leads to a decrease in income per capita of a quarter of the original output. Their results also suggest that a large fraction of the actual difference in

[6] See, for instance, Goldin (1990), Dollar and Gatti (1999), Tzannatos (1999), or Klasen (2002).

[7] Lagerlöf (2006) calibrates the Galor-Weil model but does not provide a quantitative estimate of the productivity costs associated with a decrease in gender inequality. Cuberes and Teignier (2014) provide a comprehensive review of the empirical and theoretical literature on the two-directional link between growth and gender gaps.

output per capita between the U.S. and other countries is indeed generated by the presence of gender inequality in wages.

In terms of building theories in which restricting women from certain occupations results in a loss of aggregate productivity, Esteve-Volart (2009) presents a model of occupational choice and talent heterogeneit. Her paper finds that labor market discrimination leads to lower average entrepreneurial talent and slower female human capital accumulation which, in turn, has a negative impact on technology adoption, innovation and economic growth. The model, however, is only used to derive qualitative results but not to perform numerical exercises.

To our knowledge, the only existing quantitative paper that incorporates these two extensions is Hsieh et al. (2013). Their paper uses a Roy model to estimate the effect of the changing occupational allocation of white women, black men, and black women between 1960 and 2008 on U.S.'s economic growth and finds that the improved allocation of talent within the United States accounts for 17 to 20 percent of growth over this period. Our paper differs from theirs in several dimensions. First, we study the effects of gender inequality in the labor market in a large sample of countries, rather than just focusing in one. Second, our theoretical framework is substantially different from theirs in that we emphasize, although, in a static framework, the span-of-control element of agents who run firms.[8]

3 Model

In this section, we present a general equilibrium occupational choice model where agents are endowed with a random entrepreneurship skill, based on which they decide to work as either employers, self-employed, or workers. We assume an underlying distribution of entrepreneurial talent in the population, and study the resulting allocation of productive factors across entrepreneurs and its consequences in terms of aggregate productivity. The model is based on Lucas (1978), although one important difference is that we add the possibility of working as a self-employed. This addition makes the model better suited to fit the data in developing countries, where a large fraction of the labor force is indeed self-employed.

3.1 Model Setup

The economy we consider has a continuum of agents indexed by their entrepreneurial talent x, drawn from a cumulative distribution Γ that takes values between B and $\bar{z}$. It is a closed economy with a workforce of size N and K units of capital. A fraction λ of the labor force are men, with the remaining $1-\lambda$ being women. Labor and capital are inelastically supplied in the market by consumers and then combined in firms to produce an homogeneous good.

[8]Our paper also relates to several recent papers that have used the span-of-control model of Lucas (1978) to study the effects of financial frictions and other cross-country differences on the misallocation of resources and productivity. See, for example, Amaral and Quintin (2010), Antunes et al. (2008), Bhattacharya et al. (2013), Buera et al. (2011), Buera and Shin (2013) and Erosa et al. (2010).

Agents rent the capital stock they own to firms in exchange for the rental rate r, and decide to become either firm workers, who earn the equilibrium wage rate w, or entrepreneurs, who earn the profits generated by the firm they manage. An agent with entrepreneurial talent level x who chooses to hire $n(x)$ units of labor and rent $k(x)$ units of capital produces $y(x)$ units of output and earns profits $\pi(x) = y(x) - rk(x) - wn(x)$, where the price of the homogeneous good is normalized to one. As in Lucas (1978) and Buera and Shin (2011), the production function is given by

$$y(x) = x\left(k(x)^{\alpha} n(x)^{1-\alpha}\right)^{\eta}, \tag{1}$$

where $\alpha \in (0,1)$ and $\eta \in (0,1)$. The parameter η measures the "span of control" of entrepreneurs and, since it is smaller than one, the entrepreneurial technology involves an element of diminishing returns. On the other hand, if an agent with talent x becomes self-employed and chooses to use the amount of capital $\tilde{k}(x)$, his or her profits are given by $\tilde{\pi}(x) = \tilde{y}(x) - r\tilde{k}(x)$ and the technology he or she operates is

$$\tilde{y}(x) = \tau x \tilde{k}(x)^{\alpha\eta}, \tag{2}$$

where τ is a positive parameter that can be larger or smaller than one. As explained below, this parameter is a useful one when we try to match our model with the data.[9]

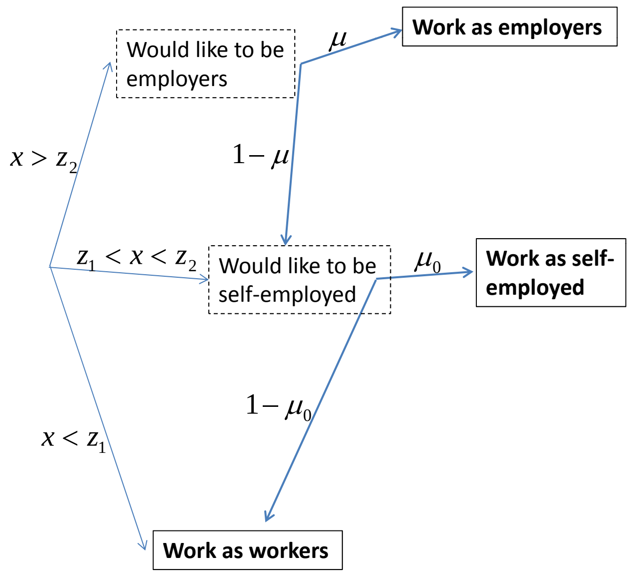
Next we assume that, while men's occupational choices are unrestricted, women face several exogenous restrictions. The first constraint is that only a fraction μ of those women who would like to be employers are allowed to do so, while a fraction $1-\mu$ is excluded from that occupation. A second constraint is that a fraction μ_o of those women who would like to be self-employed are allowed to do so, while a fraction $1-\mu_o$ of those are only allowed to be workers. Figure 1 illustrates how these constraints are linked to the talent draw of each agent and what they imply in terms of occupational choice for women.[10] The third restriction is that if women become workers, they receive a lower wage than men since they have to pay the a cost $\psi > 0$.[11] Finally, the fourth friction we introduce is that only a fraction of women

[9] The consumption good produced by the self-employed and the capital they use is the same as the one of the employers. However, in order to write down the market-clearing conditions it is convenient to denote them $\tilde{y}$ and $\tilde{k}$, respectively.

[10] Note that we are not allowing females who are excluded from self-employment to become employers. We think this a sensible assumption because it is hard to think of situations in which women are excluded from being self-employed but not from being employers, which in the model requires hiring workers and renting more capital.

[11] We assume that this is a deadweight cost, i.e. the cost for the employer is the same when hiring a man or a woman. In other words, the choice of whether to hire a male or female worker does not affect the employer's profits because women are in effect less productive than men. One justification for this is provided in Becker (1957), where the presence of women in the labor force generates a negative externality on men's utility. Female workers can also be less productive if their skills needed to be workers - not modeled here - are worse than those of men, perhaps due to gender differences in schooling. Finally, one could also interpret ψ as a utility cost for female workers, reflecting the fact that, especially in developing countries, being a worker is associated with low flexibility in the amount of working hours, generating a cost for women who contemplates

Figure 1: Occupational choice map for women



can participate at all in the labor market. Since we do not have a household sector, the rest of the women have no output in our model.

These constraints on their occupational choices may be the result of pure discrimination against women or they may reflect the rational choice of women that, for some reason not captured in the model, decide not to work as managers or self-employed. Similarly, it could also reflect the fact that women have less managerial skills than men - either because of early discrimination in education or because of a mismatch between the education they acquired and the skills demanded in the market.[12]

3.2 Agents' optimization

3.2.1 Employers

Employers choose the labor and capital they hire in order to maximize their current profits π. The first order conditions that characterize their optimization problem are given by

$$(1-\alpha)\,\eta x k(x)^{\alpha\eta} n(x)^{\eta(1-\alpha)-1} = w, \tag{3}$$

$$\alpha\eta x k(x)^{\alpha\eta-1} n(x)^{\eta(1-\alpha)} = r. \tag{4}$$

the possibility of having children.

[12]We abstract from human capital accumulation decisions in the model.

Hence, at the optimum, all firms have the common capital-labor ratio (5):

$$\frac{k(x)}{n(x)} = \frac{\alpha}{1-\alpha}\frac{w}{r}, \tag{5}$$

where $k(x)$ and $n(x)$ denote the optimal capital and labor levels for an employer with talent level x. Intuitively, a higher $\frac{w}{r}$ ratio implies a more intensive use of capital relative to labor. The solution values for $n(x)$ and $k(x)$ can be obtained combining equations (3) and (5). Both $n(x)$ and $k(x)$ depend positively on the productivity level x, as equations (6) and (7) show:

$$n(x) = \left[x\eta(1-\alpha)\left(\frac{\alpha}{1-\alpha}\right)^{\alpha\eta}\frac{w^{\alpha\eta-1}}{r^{\alpha\eta}}\right]^{1/(1-\eta)}, \tag{6}$$

$$k(x) = \left[x\eta\alpha\left(\frac{1-\alpha}{\alpha}\right)^{\eta(1-\alpha)}\frac{r^{\eta(1-\alpha)-1}}{w^{\eta(1-\alpha)}}\right]^{1/(1-\eta)}. \tag{7}$$

3.2.2 Self-employed

When a self-employed agent with talent x chooses the capital to maximize his or her profits, the first order condition of the problem is

$$\tau x\alpha\eta k(x)^{\alpha\eta-1} = r \tag{8}$$

and so the optimal level of capital is given by

$$\tilde{k}(x) = \left(\frac{\tau x\alpha\eta}{r}\right)^{\frac{1}{1-\alpha\eta}}. \tag{9}$$

Figure (2) displays the shape of the two profit functions and the wage earned by workers.[13]

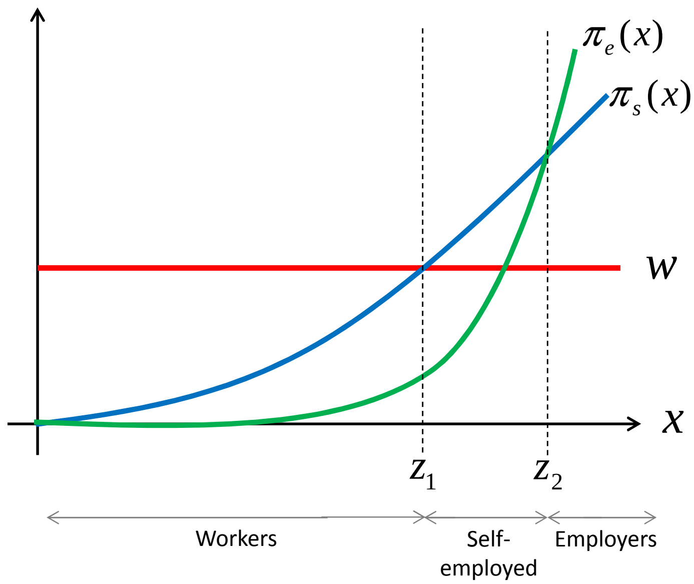
3.2.3 Occupational choice

The relevant cutoffs for men and women are displayed in Figure (2). Here we present the equations that define these thresholds. Men's occupational choices are determined by two cutoffs. The first one, z_1^m, defines the earnings such that a man is indifferent between being a worker and a self-employed, and is given by

$$w = z_1^m \tilde{k}\left(z_1^m\right)^{\alpha\eta} - r\tilde{k}\left(z_1^m\right). \tag{10}$$

[13] In order to construct this figure we are implicitly using values for the parameters τ, α, and η, such that the three occupations are chosen in equilibrium.

Figure 2: The occupational map



If $x \leq z_1^m$ men choose to become workers, and if $x > z_1^m$ they become self-employed or employers. If they become workers they obviously do not hire any capital or labor input. Women, on the other hand, face a fixed cost $\psi > 0$ if they choose to be workers and so their first threshold z_1^f is given by

$$w - \psi = z_1^f \tilde{k}\left(z_1^f\right)^{\alpha\eta} - r\tilde{k}\left(z_1^f\right). \tag{11}$$

If $x \leq z_1^f$ women choose to become workers, and if $x > z_1^f$ they (potentially) become self-employed or employers.[14] As before, both the labor and capital demand for female workers is zero. The second cutoff, z_2, determines the choice between being a self-employed or an employer. This threshold is the same for men and women and it is given by

$$\tau z_2 \tilde{k}(z_2)^{\alpha\eta} - r\tilde{k}(z_2) = z_2 x \left(k(z_2)^{\alpha} n(z_2)^{1-\alpha}\right)^{\eta} - rk\left(z_2\right) - wn(z_2) \tag{12}$$

so that if $x > z_2$ every man becomes an employer and every woman attempts to do so

3.3 Competitive Equilibrium

In equilibrium, the total demand of capital by employers and self-employed must be equal to the exogenously given aggregate capital endowment K. Assuming an upper bound $\bar{z}$ on

[14] We say "potentially" because, as stated above, only a fraction $\mu_0(\mu)$ of women who want to be self-employed (employers) are allowed to be so, respectively.

talent,[15] this condition is given by

$$\lambda\left[\int_{z_2}^{\bar{z}} k(x)d\Gamma(x) + \int_{z_1^m}^{z_2} \tilde{k}(x)d\Gamma(x)\right] \quad + $$
$$(1-\lambda)\left[\mu\int_{z_2}^{\bar{z}} k(x)d\Gamma(x) + (1-\mu)\mu_0\int_{z_2}^{\bar{z}} \tilde{k}(x)d\Gamma(x) + \mu_0\int_{z_1^f}^{z_2} \tilde{k}(x)d\Gamma(x)\right] \quad = \quad K/N. \quad (13)$$

The first bracket represents the demand for capital by male employers and male self-employed. Females' demand for capital is calculated in the second bracket and it has three components. The first one represents women with enough ability to be employers who are allowed to be so. The second term shows the fraction of women who, after being banned from employership, they become self-employed. Finally, the third term denotes the demand for capital from women with enough ability to be self-employed and that are allowed to do so.

In the labor market, the total demand of workers must also be equal to its total supply:

$$\lambda\left[\int_{z_2}^{\bar{z}} n(x)d\Gamma(x)\right] + (1-\lambda)\left[\mu\int_{z_2}^{\bar{z}} n(x)d\Gamma(x)\right] \quad =$$
$$\lambda\Gamma(z_1^m) + (1-\lambda)\left[\Gamma(z_1^f) + (1-\mu)(1-\mu_0)(1-\Gamma(z_2)) + (1-\mu_0)(\Gamma(z_2)-\Gamma(z_1^f))\right]. \quad (14)$$

The left-hand-side of this expression represents the labor demand for men with ability above z_2 and women with ability above this same cut-off that are allowed to be employers. The right-hand-side is the labor supply. The first term is the fraction of men with ability less or equal to z_1^m. The term in brackets has three components: the first one is the fraction of least able women, those with ability below the threshold z_1^f. The second term is the fraction of women with enough ability to be employers but that are excluded from both being employers (a fraction $1-\mu$) and self-employed (a fraction $1-\mu_0$). Finally, the last term is the fraction of women with ability just enough to be self-employed but not to be employers that are not allowed to work as self-employed.

[15] In the next section we discuss how, without this bound, the integrals in the equations (13) and (14) are not well-defined.

In this economy, aggregate income per capita is equal to total production per capita,

$$y \equiv \frac{Y}{N} = \lambda \left[\int_{z_2}^{\bar{z}} y(x) d\Gamma(x) + \int_{z_1^m}^{z_2} \tilde{y}(x) d\Gamma(x) \right] \quad +$$

$$(1-\lambda) \left[\mu \int_{z_2}^{\bar{z}} y(x) d\Gamma(x) + (1-\mu)\mu_0 \int_{z_2}^{\bar{z}} \tilde{y}(x) d\Gamma(x) + \mu_0 \int_{z_1^f}^{z_2} \tilde{y}(x) d\Gamma(x) \right] \tag{15}$$

where $y(x)$ and $\tilde{y}(x)$ are defined in equations (1) and (2), respectively.

A competitive equilibrium in this economy is a triplet of cutoff levels (z_1^m, z_1^f, z_2), a set of quantities $\left[n(x), k(x), \tilde{k}(x)\right], \forall x$, and prices (w, r) such that equations (6) -(14) are satisfied; that is agents choose their occupation optimally, entrepreneurs choose the amount of capital and labor to maximize their profits, and all markets clear.

3.4 Gender Gaps in Labor Force Participation

As discussed in Section 3.1., another type of gender gap that we introduce in the model is the exclusion of women from the work force, both as entrepreneurs and employees. If we keep the capital stock fixed, when a fraction of women does not supply labor to the market, output per worker in our model mechanically increases due to the presence of diminishing returns to labor. Income per capita, however, decreases. Formally, recalling that N denotes the total labor force and defining P as total population, we have $\frac{Y}{P} = \frac{N}{P} y$. With this formulation, it is then possible to study the impact of reducing the employment-to-population ratio N/P below 1. Under the assumptions that men represent 50% of the population and that all male participate in the labor force, $L^m = 0.5P$. Thus, given that we defined λ as the fraction of men in the labor force, $\lambda \equiv \frac{L^m}{N}$, the fraction of females in the labor force over the fraction of males in the labor force is equal to $\frac{1-\lambda}{\lambda}$ and so $1 - \frac{1-\lambda}{\lambda}$ represents the fraction of females excluded from the labor force.

3.5 Comparative Statics

In this subsection we show qualitatively how the model 's occupational choice is affected by exogenous changes in three of the friction parameters, namely the fraction of women who can work as employers (μ), the fraction of women who can work as self-employed (μ_0), and the wage loss for women (ψ). Figure (3) shows the qualitative effects of a decline in μ and μ_0, while the effect of an increase in the wage gap ψ is displayed in Figure (4).

3.5.1 An increase in managerial gender gaps ($\downarrow \mu$)

A decrease in μ initially generates a decline in the number of employers and hence a decrease

Figure 3: Effects of $\mu - gap$ and $\mu_o - gap$

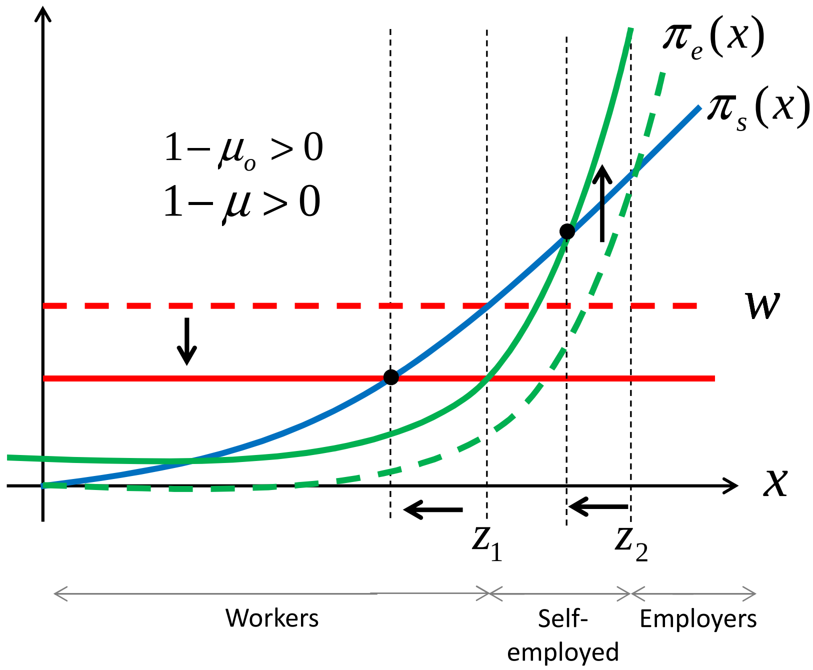
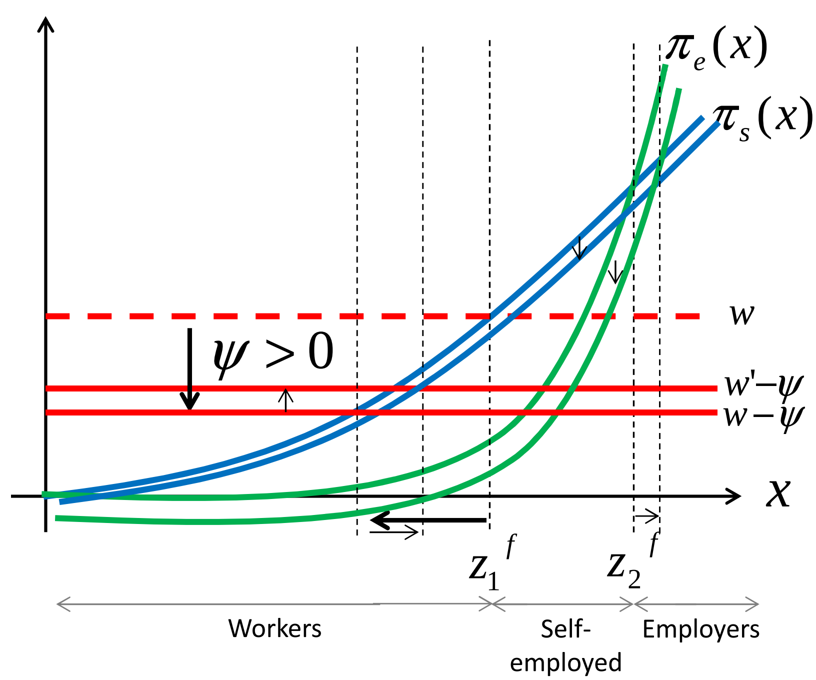


Figure 4: Effects of $\psi - gap$



in the labor demand and the equilibrium wage, which decreases the cutoff z_1. Everything else equal, this results in an increase in profits for the remaining employers, which reduces the cutoff z_2. The effect on the demand for capital is ambiguous since the demand from employers declines but that of the self-employed increases.

3.5.2 An increase in self-employment gender gaps ($\downarrow \mu_0$)

A decrease in μ_0 generates a decline in the number of self-employed and hence an increase in the labor supply, which in turn drives wages down. As in the previous case, this has a direct negative effect on the cutoff z_1 as well as an indirect negative effect on the cutoff z_2, through its effect on the employers' profit function. As before, whether the demand for capital increases or decreases is a quantitative question since there is a negative effect from the drop in self-employed and a positive one from the rise in employers. If it actually decreases, the cost of renting capital goes down, so both self-employed and employers' profits increase, so both cutoffs z_1 and z_2 further decrease.

3.5.3 An increase in wage discrimination ($\uparrow \psi$)

An increase in the wage cost ψ shifts female workers' earnings down and, everything else equal, this makes self-employment a more attractive occupation for women. This decreases the cutoff z_1^f and the associated drop in the labor supply pushes wages up, reducing employers' profits. At the same time, the demand for capital increases, which pushes the rental price upwards, reducing profits for both employers and self-employed, and hence increasing the cutoffs z_1 and z_2.

4 Model Simulation

4.1 Skill Distribution

To simulate the model, we use a Pareto function for the talent distribution, as in Lucas (1978) and Buera et al. (2011). As a consequence, the firm size distribution is also Pareto, which is consistent with papers showing that the U.S firm size distribution fits remarkably well a Pareto distribution with parameter equal to one, known as Zipf's Law.[16]

The cumulative distribution of talent is

$$\Gamma(x) = \frac{1 - B^\rho x^{-\rho}}{1 - B^\rho \bar{z}^{-\rho}},\ 0 \leq x \leq \bar{z}, \tag{16}$$

where we assumed an upper bound $\bar{z}$ on talent, and $\rho,\ B > 0$. The density function of talent is then

$$\gamma(x) = \frac{\rho B^\rho x^{-\rho-1}}{1 - B^\rho \bar{z}^{-\rho}},\ 0 \leq x \leq \bar{z}. \tag{17}$$

[16] See Axtell (2001) and Gabaix (2012).

Using equations (6) and (17), we can derive the density function of the firms' size, n:

$$s(n) = \gamma\left(n^{-1}(x)\right) = \gamma\left(\frac{n^{1-\eta}}{\eta(1-\alpha)}\left(\frac{\alpha}{1-\alpha}\right)^{-\alpha\eta}\frac{w^{-\alpha\eta+1}}{r^{-\alpha\eta}}\right)$$
$$= \frac{\rho B^{\rho}}{1-B^{\rho}\bar{z}^{-\rho}} n^{-(1-\eta)(1+\rho)}\left(\eta(1-\alpha)\left(\frac{\alpha}{1-\alpha}\right)^{\alpha\eta}\frac{w^{\alpha\eta-1}}{r^{\alpha\eta}}\right)^{1+\rho}. \quad (18)$$

This shows that the distribution of firms size is also Pareto and, if $(1-\eta)(1+\rho) = 1$, it satisfies Zipf's law.[17]

4.2 Model Parametrization

Table 1: Parameter values

Parameter	Value	Explanation
B	1	Normalization
η	0.79	From Buera and Shin (2011)
ρ	3.76	To satisfy Zipf's Law for distribution of firms' size: $-(1-\eta)(-1-\rho) \approx 1$
α	0.378	To match capital share: $\alpha\eta = 0.3$
$\bar{z}$	4.96	To match average fraction entrepreneurs in data: 2.8%
τ	0.94	To match fraction own-account workers in data: 26.6%, on average

Table (1) shows the parameter values used in the simulations. The parameter B of the Pareto distribution is normalized to 1, while the parameter η is taken from the literature. On the other hand, the parameters ρ and α are chosen to match some stylized facts. Finally, the parameters $\bar{z}$ and τ are calibrated to minimize the distance between some moments of our data and the predictions of the model.

Specifically, the span-of-control parameter η is set equal to 0.79, following Buera and Shin (2011).[18] The value used for the parameter ρ is set equal to 3.76 so that the talent distribution satisfies Zipf's Law.[19] The capital exponent parameter α is set to 0.38 in order to make $\alpha\eta$ equal to 30%, as in Buera and Shin (2011), since 30% is the value typically used for the

[17] If we use an unbounded Pareto distribution, i.e. $\bar{z} \to \infty$, we need to assume that $\rho > \frac{1}{1-\eta}$ so that the integral $\int_{z}^{\bar{z}} x^{\frac{1}{1-\eta}} d\Gamma(x)$ is defined. This, however, implies $1+\rho > \frac{1}{1-\eta}$, which contradicts Zipf's Law for the distribution of firms' size. See Appendix A.

[18] Buera and Shin (2011) choose η to match the fraction of total income of the top five per cent of earners in the U.S. population, which is 30%, given that top earners are are always entrepreneurs in the model and in most cases in their data.

[19] This value is not very different than the one used by Buera, Kaboski and Shin (2011), 4.84, which they choose to match the employment share of the largest 10 percent of establishments in the U.S.

aggregate income share of capital and we are considering the entrepreneurs' earnings as labor income.

The talent upper bound $\bar{z}$ is set equal to 4.96 to make the world-average share of employers predicted by the model match the one observed in our data set, which is equal to 2.81%.[20] Finally, the self-employed productivity parameter, τ, is assumed to be country-specific and it is estimated in a country-by-country basis to match the fraction of own-account workers in the data. To derive the results of this section, τ is set equal to 0.94, which is the cross-country average of the values estimated in Section 5.

4.3 Potential income losses from gender gaps

Table 2 shows the income per worker losses caused by the introduction of the different gender gaps considered in this paper. As stated above, women are assumed to be identical to men in all dimensions, so in the absence of gender gaps, their occupational choices are the same as those of males. When the four gender gaps $(\mu, \mu_0, \psi, \lambda)$ are introduced, however, the efficient allocation is distorted and, as a result, there is a decline in aggregate income per worker and/or per capita.[21]

The first row shows that the income decline is almost 7% when we exclude all women from the possibility of being employers, while the second row shows that income falls by about 2% when all females are excluded from self-employment. When we reduce the wage earned by females by 50%, on the other hand, income decreases by more than 4%, and when we exclude all women from the labor market income per capita falls by almost 40%.

When the highest possible μ*-gap* is introduced, i.e. when no female works as an employer, our model predicts a 10% fall in the wage rate, a 6.8% fall in the capital rental rate and output per worker, as well as an increase of about 45% in the fraction of male employers and 42% in the fraction of male self-employed and an increase of 63% in the fraction of female self-employed. Similarly, when the highest μ_o*-gap* is introduced, the fraction of males choosing to be employers or self-employed increases by about 10%, while the fraction of female workers increases by 31%. The final decrease on the wage rate is about 2.5%, while the fall in the

[20] The cross-country weighted average of the entrepreneurs' share in the data is computed using data on the variable *Employers* from the International Labor Organization, Table 3 - Status in Employment (by sex), as described in the next section. The weights of each country are equal to the country's employment over total employment in our sample.

[21] As explained before, we refer to the gaps generated by μ and μ_0 as the percentage of women *excluded* from entrepreneurship and to the one generated by λ as the percentage of women excluded from the labor force. However, we do not make any claim on whether this *exclusion* is voluntary or not since there may be reasons other than discrimination that explain these gaps.

Table 2: Potential effects of gender gaps

	Income loss
Due to highest possible μ-gap ($\mu = 1 \;\to\; \mu = 0$)	6.85%
Due to highest possible μ_o-gap ($\mu_o = 1 \;\to\; \mu_o = 0$)	1.96%
Due to highest possible ψ-gap ($\psi = 0 \;\to\; \psi = 0.5w$)	4.25%
Due to highest possible λ-gap ($\lambda = 0.5 \;\to\; \lambda = 1$)	38.4%

capital rental rate and output per worker is about 2%.

On the other hand, when a wage gap equal to half of the frictionless wage is introduced, the fraction of self-employed females rises from 23% to 83%, while the fraction of male employers and self-employed decreases by about 25%. The equilibrium wage rate, in turn, increases by 13.6% while the capital rental rate and output per worker decrease by 4.25%. Finally, the exclusion of all females from the labor force affects income per capita negatively because fewer people work, even if output per worker increases. In particular, when only men supply their labor force and the capital stock is constant, the wage rate and output per worker increases by more than 23% because there are decreasing returns to scale to labor. When taking into account that only half of the population work, income per capita falls by about 38.4%.

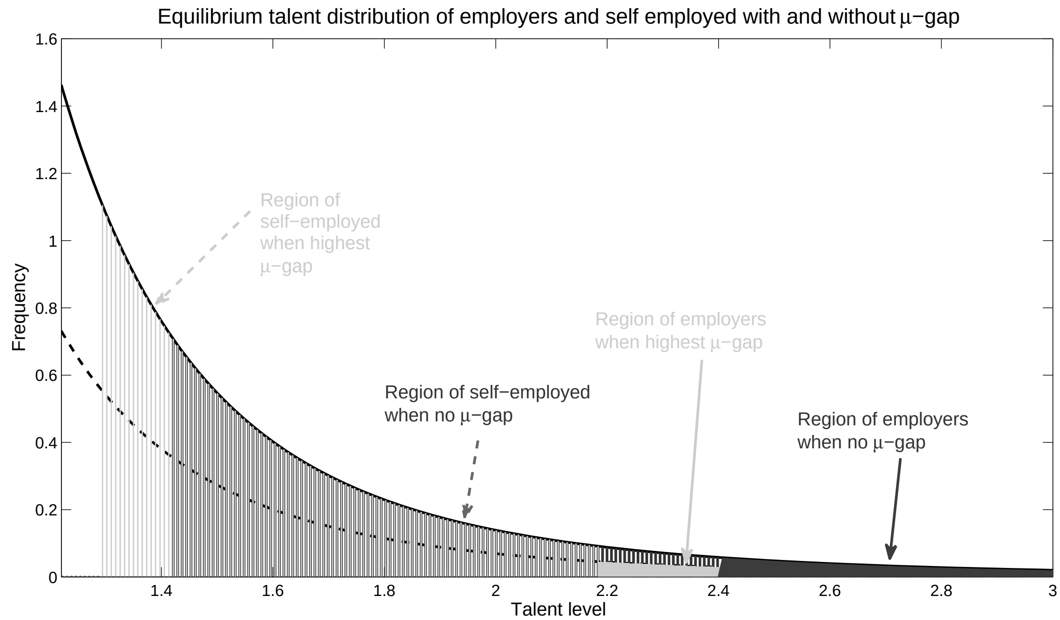
The effects of the highest possible $\mu - gap$ on the talent distribution and the talent thresholds are presented graphically in Figure 5. Specifically, this figure shows that when women are not eligible as employers, the density function of employer candidates shifts downwards while both the employer and self-employed thresholds fall.[22]

4.4 Interactions between gender gaps

The values in Table 2 correspond to a situation where each gender gap is introduced and there is no other gap present. The values in Table 3, on the other hand, show that the effect of each gender gap is different depending on the value of the other gaps. As one can see in column 2, when there are no other gaps, the effect of the highest possible μ-*gap* is an income loss of almost 7%, but when the μ_o-*gap* is as high as possible, the effect becomes higher than 10% because women do not use their entrepreneurial talent neither as employers nor as self-

[22]Note that this figure is consistent with the illustrative Figure 3.

Figure 5: Graphical effects of $\mu - gap$



employed. When there is also a ψ-*gap* equal to one third of the frictionless wage, the effect of the μ-*gap* increases only slightly to 7.5%. However, when a λ-*gap* corresponding to $\lambda = 0.75$ (i.e. when 2/3 of females are excluded from the labor force), the effect of the μ-*gap* falls to 3%, the reason being that the aggregate effect of excluding females from being employers is smaller the lower is the fraction of females in total labor force.

Similarly, as shown in column 3, the effect of the μ_o-*gap* rises from 1.96% to 5.6% when it is interacted with the μ-*gap* because no female takes advantage of the wage fall by becoming employer. However, the effect of the μ_o-*gap* shrinks to 1% when interacted with the λ-*gap* and to 0.25% when interacted with the ψ-*gap* because it almost offsets all the distortion caused by the μ_o-*gap* in the decision between being a worker or a self-employed. To obtain the total income loss due to gender gaps in entrepreneurship, one has to compute the effect of excluding all women from both employership and self-employment. This corresponds to adding up the 6.85% in column 1 of Table 2 and the 5.6% in column 2 (or, equivalently, adding up the 10.3% in column 1 and the 1.96% in column 2) which gives an income loss of 12.3% approximately.

Finally, the effect of the ψ-*gap* (a reduction in female wages by one third) goes from 4.25% to 5.4% if the μ-*gap* is also present, but it does not change at all if the μ_o-*gap* is present. The reason for this last result is that ψ does not inefficiently increase the fraction of self-employed females because all women are already excluded from self-employment. When we add the λ-*gap*, the cost of the ψ-*gap* becomes 2.2% since there are less women in the labor force and,

Table 3: Income losses due to each gender gap when other gaps are present

	Effects μ-gap	**Effects μ_o-gap**	**Effects ψ-gap**
No other gaps	6.85%	1.96%	4.25%
μ-gap also present ($\mu = 1 \;\rightarrow\; \mu = 0$)		5.6%	5.4%
μ_o -gap also present ($\mu_o = 1 \;\rightarrow\; \mu_o = 0$)	10.3%		0%
ψ-gap also present (ψ=**0** $\rightarrow \psi$=$\frac{1}{3}w$)	7.5%	0.25%	
λ-gap also present (λ=**0.5** $\rightarrow \lambda$=**0.75**)	3%	1%	2.2%

therefore, the aggregate effects are smaller.

5 Cross-country analysis

In this section, we use labor market data for 126 countries from the International Labor Organization (KILM, 7th Edition Table 3 - Status in Employment, by sex) for the latest available year. The variables used are the labor force participation, the number of employers, and the number of own-account workers (which we identify as self-employed in our paper), all of them by gender. Specifically, the variable *Employers* is defined in KILM as "*those who, working on their own or with a few partners, hold the type of jobs defined as self-employment jobs, and, in this capacity, have engaged, on a continuous basis, one or more persons to work for them as employee(s)*", while the variable *Own-account workers* are "*those workers who, working on their own account or with one or more partners, hold the type of job defined as self-employment jobs, and have not engaged on a continuous basis any employees to work for them.*"[23]

5.1 Country-specific parameters

For each country, we compute the parameter τ_i, which represents the relative productivity of the self-employed as well as the gender gap parameters, μ_i, μ_{oi}, ψ_i, and λ_i. Table 4 gives, for each parameter, the range of values we obtained and the data moments used in the calculation, while the values for each specific country can be found in Appendix B.[24]

The parameter λ_i determines the labor force participation gender gap, which is equal to

[23]In KILM, the category "self-employed" is subdivided in four groups: employers, own-account workers, members of producers' cooperatives, and contributing family workers. Given the definition of each of these groups, we have decided that the most sensible choice was to use own-account workers to represent the self-

Table 4: Country specific parameters

Parameter	Value	
λ_i	$\in [50\%,\ 88.8\%]$	Equal to fraction of males in labor force, for each country
μ_i	$\in [17\%,\ 100\%]$	Equal to female-male ratio employers, for each country
μ_{oi}	$\in [0\%,\ 100\%]$	To match female-male ratio self-employed, for each country
ψ_i	$\in [0,\ 24\%]$ as a fraction of the wage rate	To match female-male ratio self-employed (if $\mu_i^o = 1$)
τ_i	$\in [65.5\%,\ 148.4\%]$	To match % self-employed in labor force, for each country

$1 - \frac{1-\lambda_i}{\lambda_i}$, as explained in section 3.4. λ_i is computed directly from the data and it is equal to the fraction of males in the country's labor force. It ranges from 0.5 to 0.88, which implies that the fraction of females excluded from the labor market is between 0% and 86%. Similarly, the parameter μ_i, which determines the employers' gender gap $1 - \mu_i$, is also computed directly from the data as the ratio of female to male employers. The smallest value found is 0.17 while the largest is 1, meaning that the fraction of females excluded from employership ranges from 0% to 83%.

The rest of the country-specific parameters, μ_{oi}, ψ_i and τ_i, are inferred from the data to simultaneously match some data moments related to the observed occupational choices, taking into account that these choices are in turn affected by other parameters of the model. In particular, the parameter μ_o is computed to match the female-to-male ratio of self-employed, since it determines the self-employed gender gap $1 - \mu_o$. The estimated values range from 0 to 1, meaning that the inferred self-employed gap is 0 in some countries and 100% in some other countries. It turns out that our model does not generate enough female self-employed to match the data in about 20% of the countries. When this happens, we introduce the wage gap parameter ψ to match the female-to-male ratio of self-employed perfectly. The largest wage gap inferred is equal to 24% of the country's equilibrium wage, while for 80% of the countries - those for which the model predicted enough self-employed to match the data, we infer a wage gap equal to zero.

Finally, the self-employed relative productivity parameter, τ, is computed to match the

employed in our model, and assume that the rest of the categories are workers.

[24] Appendix D shows the results of our simulations for every country included in the sample. Notable omissions are the United States, Canada, and China for which the latest version of KILM does not provide the necessary data.

fraction of self-employed to employers in each country. It determines the productivity ratio between a self-employed and an employer with the same entrepreneurial talent renting the same amount of capital and hiring only one worker. We find that it takes values between 0.65 and 1.48, and that it is below one in almost 70% of the countries in our sample, indicating that for the model to match the data, working as a self-employed must create some kind of productivity disadvantage.[25]

5.2 Cross-country results

The cross-country results obtainedare summarized in Table 5 and Figure 6. In Table 5 we split our sample of countries in 7 geographic regions, *Central Asia* (6), *East Asia and the Pacific* (14), *Europe (29), Latin America and the Caribbean* (27), *Middle East and North Africa* (14), *South Asia* (8), and *Sub-Saharan Africa* (28).[26] For each region, column (2) shows the average labor force participation gender gap whereas columns (3) and (4) show the average gender gaps for employers and self-employed, respectively. The wage gap is displayed in column (5). The last two columns of the table show how these frictions translate into average losses in income per capita. The total average income loss is shown in column (6), and column (7) shows the fraction of this loss generated by the occupational restrictions (including the wage gap). The difference between columns (6) and (7), not shown in the table, would be the income loss generated by the exclusion of women from the labor market.

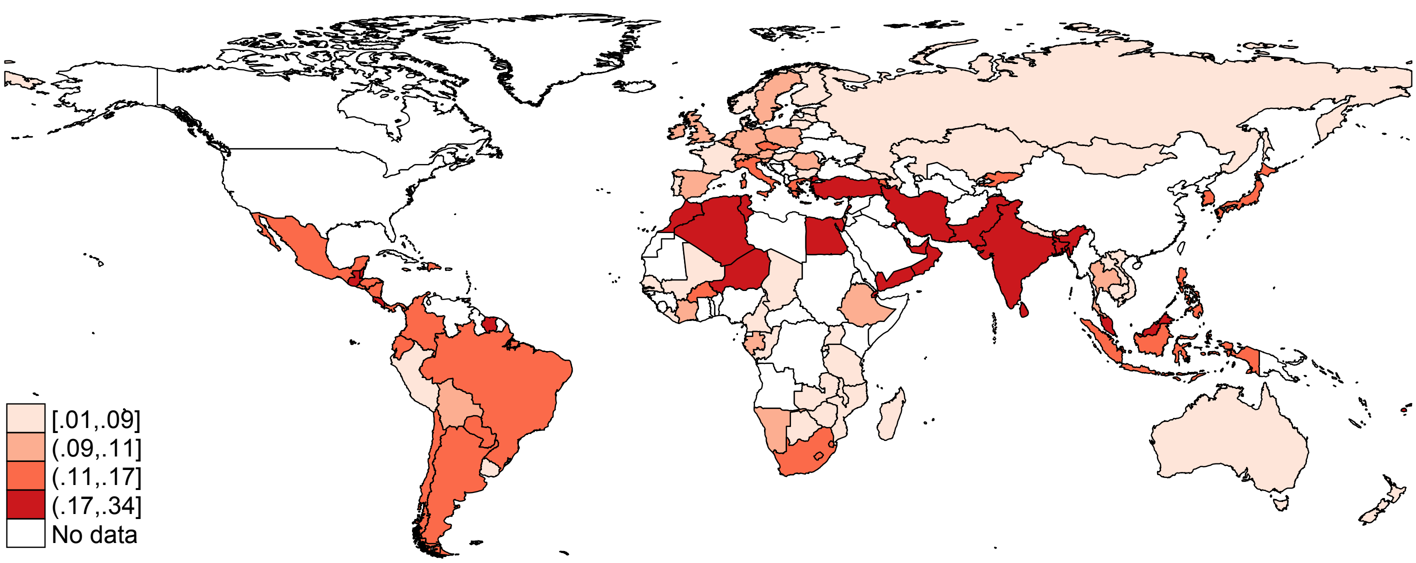
Our results suggest the existence of remarkable differences in gender gaps across regions, which lead to significant variation in the implied income losses. The region with the largest income loss is *Middle East and North Africa* (MENA) where, according to our estimates, the total income loss is 27% and the income loss due to occupational choice gaps is 6.9%. *South Asia* (SA) has the second largest income losses due to gender gaps, 19.2%, a fourth of which is due to occupational gaps. *Sub-Saharan Africa* (SSA), on the other hand, is the region with the lowest total income loss due to gender gaps, 8.5%, and also with the lowest entrepreneurship gender gaps, while *Europe* (EU) is the region with the lowest labor participation gender gap, 15.1%, and the second lowest total income loss, 10.4%.

The total income loss caused by these gender gaps for each country in our sample is shown in the map of Figure 6. As it is apparent, the countries with the highest costs associated with gender gaps are located in the Middle East and North Africa, South Asia, and to a lesser extent, Latin America and the Caribbean.

Table 5: Income loss due to gender gaps, by region

	LFP GG, avg $\lambda - gap$ %	**Empl. GG, avg** $\mu - gap$ %	**Self GG, avg,** $\mu_o - gap$ %	**Wage GG, avg** $\psi - gap$ %	**Total income loss from Gender Gaps** (%)	**Income loss due to Entrepr. Gap** (%)
CA	21.1	65.9	25.4	1.8	11.3	4.9
EAP	21.6	53.6	48	0	11.8	5
EU	15.1	619	54.4	0	10.4	5.8
LAC	31	53.3	24.3	1.4	14	4.1
MENA	67.6	74.5	53	2.2	27.4	6.9
SA	46.7	54.9	28.6	2.9	19.2	4.9
SSA	15.9	52.7	17.3	3.4	8.5	3.3

Figure 6: World map of total income loss due to gender gaps



6 Conclusion

This paper uses an occupational choice model to quantify the effects of gender gaps in the labor market on aggregate productivity and income per capita. Our numerical results show that gender gaps in entrepreneurship have significant effects on the allocation of resources and so on aggregate productivity, while the gap from labor force participation has a large effect on income per capita. Specifically, if no women worked as an employer or a self-employed, our model predicts that income per worker would drop by around 12%, while if the labor force participation of women was zero, income per capita would decrease by almost 40%.

When we carry out the country-by-country analysis, we find that there are important differences across countries and geographical regions. To sum up our results, gender inequality creates an average income loss of 13.5%, which can be decomposed in losses due to gaps in occupational choices of about 5% and losses due labor force participation gaps of about 8.5%. The region with the largest income loss due to gender inequality is Middle East and North Africa, with an average income loss of 27%, followed by South Asia and Latin America and the Caribbean, with average income losses of 19% and 14%, respectively.

In terms of future research, we are considering to extend this framework in several different directions. First, introducing a fourth occupational choice, namely subsistence or out-of-necessity self-employed, in order to capture the fact that in many developing countries some of the own-account workers may have a lower talent than workers.[27] Second, it may be sensible to relax the assumption that the goods produced by employers and self-employed are the same ones. For instance, it seems reasonable to think that, in the real world, most of the goods produced by self-employed belong to the service sector, while employers mostly produce manufacturing goods. Provided we could find data on the the sectoral composition of countries and the range of different goods produced by employers and self-employed, we would then be able to recalibrate our model and presumably find much larger efficiency costs associated to gender gaps in the labor market. A third possible extension would be to introduce a household production sector in the model leading to a division of labor between husbands and wives, as in Becker (1981). This could explain some of the observed differences in labor participation and access to entrepreneurship between males and females and help identifying what fraction of these gaps can be considered gender discrimination. Finally, it would be interesting to develop a dynamic version of the span-of-control model presented in this paper

[25] A value of τ above one in country i implies that being a self-employed instead of an employer has a productivity advantage in country i. This could be due to regulation or other policy-related variables that treat self-employed and employers differently.

[26] We follow the World Bank to assign each country to a region, with the exception of countries that belong in the Europe and Central Asia group, which we have decided to split in two geographical regions, Europe and Central Asia, since we believe the labor markets in these two regions are very different. The numbers in parentheses indicate the number of countries assigned to each region.

[27] See, for instance, Poschke (2013).

(see, for instance, Caselli and Gennaioli 2012), which would allow us to quantify the effects of gender gaps on fertility as well as physical and human capital accumulation.

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A Results for Pareto talent distribution

As explained in Section 4, we assume that the entrepreneurial talent of agents is distributed according to the bounded Pareto distribution

$$\Gamma(x) = \frac{1 - B^\rho x^{-\rho}}{1 - B^\rho \bar{z}^{-\rho}}, \text{ for } 0 \leq x \leq \bar{z}.$$

where $\bar{z}$ denotes the upper bound of the distribution. Using this functional form, we get that

$$\int_{z}^{\bar{z}} x^{\frac{1}{1-\eta}} d\Gamma(x) = \int_{z}^{\bar{z}} x^{\frac{1}{1-\eta}} \frac{\rho B^\rho x^{-\rho-1}}{1 - B^\rho \bar{z}^{-\rho}} dx = \int_{z}^{\bar{z}} \rho B^\rho \frac{x^{\frac{1}{1-\eta}-\rho-1}}{1 - B^\rho \bar{z}^{-\rho}} dx = \frac{\rho B^\rho}{\frac{1}{1-\eta} - \rho} \left[\frac{\bar{z}^{\frac{1}{1-\eta}-\rho} - z^{\frac{1}{1-\eta}-\rho}}{1 - B^\rho \bar{z}^{-\rho}} \right].$$

B Country-by-country results[28]

	Year	Region group	Empl. gg	Self gg	LFP gg	Wage gg	Tau	Total inc. loss from gender gaps	Inc. loss from occup gender gaps
Algeria	2004	MENA	0.78	0	0.79	0.06	0.94	0.31	0.05
Antigua	2001	LAC	0.49	0.45	0.01	0	0.76	0.05	0.04
Argentina	2010	LAC	0.48	0.33	0.29	0	0.89	0.13	0.04
Armenia	2008	CA	0.92	0.30	0.19	0	0.92	0.13	0.08
Australia	2008	EAP	0.37	0.48	0.17	0	0.79	0.09	0.03
Austria	2010	EU	0.60	0.46	0.14	0	0.74	0.10	0.05
Azerbaijan	2008	CA	0.81	0	0.02	0.07	1.10	0.04	0.04
Bahrain	2010	MENA	0.71	0.95	0.74	0	0.68	0.30	0.07
Bangladesh	2005	SA	0.64	0.65	0.69	0	1.33	0.28	0.08

[28]Variable 3: World Bank region (EAP: East Asia and Pacific, EU: Europe, CA: Central Asia, LAC: Latin America and the Caribbean, MENA: Middle East and North Africa, SA: South Africa, SSA: Sub-Saharan Africa); variable 4: gender gap in employership (fraction of women excluded from employership relative to men; source: own calculations from ILO data); variable 5: gender gap in self-employment (fraction of women excluded from self-employment relative to men; source: own results from ILO data); variable 6: gender gap in labor force participation (fraction of women excluded from the labor force relative to men; source: own calculations from ILO data); variable 7: wage gender gap (female wage loss relative to males; source: own results); variable 8: Relative productivity self-employment (source: own results); variable 9: total income loss due to gender gaps (source: own results); variable 10: income loss due to gender gaps in occupational choices (source: own results).

	Year	Region group	Empl. gg	Self gg	LFP gg	Wage gg	Tau	Total inc. loss from gender gaps	Inc. loss from occup gender gaps
Barbados	2004	LAC	0.75	0.57	0.07	0	0.84	0.09	0.07
Belgium	2010	EU	0.61	0.55	0.17	0	0.78	0.11	0.06
Belize	2005	LAC	0.47	0.25	0.48	0	0.90	0.19	0.04
Bhutan	2010	SA	0	0	0.07	0.02	0.98	0.02	0.00
Bolivia	2009	LAC	0.59	0.14	0.19	0	1.00	0.10	0.04
Bostwana	2006	SSA	0.48	0	0.09	0.02	0.98	0.05	0.03
Brazil	2009	LAC	0.52	0.38	0.26	0	0.91	0.13	0.04
Bulgaria	2010	EU	0.53	0.49	0.10	0	0.77	0.08	0.05
Burkina Faso	2006	SSA	0.68	0.61	0.16	0	1.15	0.12	0.07
Cambodia	2008	EAP	0.27	0.54	0	0	1.15	0.04	0.04
Cameroon	2001	SSA	0.47	0	0.03	0.03	1.20	0.03	0.01
Cape Verde	2000	SSA	0.50	0.07	0.15	0	0.97	0.08	0.03
Chad	1993	SSA	0.67	0.31	0.06	0	1.30	0.06	0.04
Chile	2008	LAC	0.47	0.17	0.41	0	0.92	0.17	0.03
Colombia	2010	LAC	0.57	0.08	0.32	0	1.09	0.13	0.03
Congo	2005	SSA	0.68	0	0	0.12	1.25	0.02	0.02
Costa Rica	2010	LAC	0.60	0.25	0.41	0	0.88	0.18	0.05
Cote d'Ivoire	2002	SSA	0.37	0.27	0.22	0	1.17	0.10	0.03
Cyprus	2010	EU	0.82	0.56	0.17	0	0.80	0.13	0.08
Czech Republic	2010	EU	0.64	0.54	0.25	0	0.84	0.14	0.06
Denmark	2010	EU	0.70	0.71	0.09	0	0.73	0.09	0.07
Djibouti	1996	MENA	0.32	0	0.45	0.23	0.99	0.18	0.03
Dominica	2001	LAC	0.47	0.38	0.35	0	0.96	0.15	0.04
Dominic Republic	2010	LAC	0.45	0.59	0.27	0	1.09	0.13	0.05
Ecuador	2010	LAC	0.55	0.02	0.36	0	0.98	0.15	0.03
Egypt	2007	MENA	0.80	0.13	0.73	0	0.82	0.29	0.07
El Salvador	2010	LAC	0.41	0	0.27	0.10	0.95	0.12	0.03
Estonia	2010	EU	0.76	0.68	0	0	0.72	0.08	0.08
Ethiopia	2005	SSA	0.75	0.57	0.14	0	1.11	0.11	0.07
Fiji	2005	EAP	0	0.27	0.56	0	0.97	0.21	0.01
Finland	2010	EU	0.65	0.58	0.06	0	0.78	0.08	0.06
France	2010	EU	0.68	0.65	0.10	0	0.75	0.09	0.07
Gabon	2005	SSA	0.45	0	0.28	0.08	1.11	0.11	0.02

	Year	Region group	Empl. gg	Self gg	LFP gg	Wage gg	Tau	Total inc. loss from gender gaps	Inc. loss from occup gender gaps
Georgia	2008	CA	0.49	0.39	0.13	0	1.06	0.08	0.04
Germany	2010	EU	0.62	0.57	0.15	0	0.74	0.10	0.06
Greece	2010	EU	0.61	0.35	0.33	0	0.92	0.15	0.05
Grenada	1998	LAC	0.38	0.09	0.32	0	0.86	0.13	0.03
Guatemala	2004	LAC	0.55	0	0.46	0.04	0.98	0.19	0.03
Honduras	2010	LAC	0.31	0	0.43	0.04	1.07	0.16	0.01
Hong Kong	2010	EAP	0.73	0.78	0.10	0	0.75	0.10	0.07
Hungary	2010	EU	0.52	0.56	0.13	0	0.75	0.09	0.05
India	2010	SA	0.67	0.26	0.65	0	1.30	0.26	0.04
Indonesia	2009	EAP	0.66	0.37	0.39	0	1.14	0.17	0.05
Iran	2008	MENA	0.85	0.40	0.80	0	1.03	0.32	0.07
Ireland	2010	EU	0.69	0.79	0.13	0	0.83	0.11	0.07
Israel	2008	MENA	0.75	0.66	0.13	0	0.75	0.11	0.07
Italy	2010	EU	0.58	0.44	0.32	0	0.87	0.15	0.05
Jamaica	2008	LAC	0.45	0.30	0.23	0	1.05	0.11	0.04
Japan	2008	EAP	0.72	0.67	0.29	0	0.75	0.15	0.07
Kazakhstan	2010	CA	0.35	0	0.05	0.02	0.97	0.04	0.02
Korea	2008	EAP	0.59	0.42	0.28	0	0.89	0.14	0.05
Kuwait	2005	MENA	0.76	0.97	0.66	0	0.69	0.27	0.08
Kyrgyzstan	2006	CA	0.56	0.31	0.27	0	1.03	0.13	0.04
Laos	2005	EAP	0.55	0.55	0	0	1.14	0.06	0.06
Latvia	2010	EU	0.49	0.49	0	0	0.74	0.04	0.04
Lebanon	2007	MENA	0.86	0.68	0.67	0	0.95	0.28	0.09
Lesotho	1999	SSA	0	0.13	0.22	0	1.38	0.09	0.01
Liberia	2010	SSA	0.23	0	0	0.06	1.25	0.01	0.01
Lithuania	2010	EU	0.67	0.54	0	0	0.75	0.06	0.06
Luxembourg	2010	EU	0.59	0.53	0.23	0	0.71	0.13	0.05
Madagascar	2003	SSA	0.30	0.32	0.04	0	1.13	0.04	0.03
Malawi	1987	SSA	0.92	0	0	0.10	1.38	0.02	0.02
Malaysia	2010	EAP	0.68	0.49	0.43	0	0.88	0.19	0.06
Maldives	2006	SA	0.76	0	0.42	0.10	0.79	0.19	0.06
Mali	2006	SSA	0.55	0.12	0.18	0	1.14	0.09	0.03
Malta	2010	EU	0.79	0.72	0.48	0	0.80	0.22	0.08

	Year	Region group	Empl. gg	Self gg	LFP gg	Wage gg	Tau	Total inc. loss from gender gaps	Inc. loss from occup gender gaps
Mauritius	2010	SSA	0.66	0.51	0.45	0	0.84	0.20	0.06
Mexico	2008	LAC	0.62	0.10	0.40	0	0.90	0.17	0.04
Mongolia	2009	EAP	0.64	0.63	0.08	0	1.08	0.09	0.07
Morocco	2008	MENA	0.76	0.54	0.63	0	0.99	0.26	0.07
Mozambique	2003	SSA	0.82	0.42	0	0	1.16	0.06	0.06
Namibia	2008	SSA	0.54	0	0.22	0.03	0.78	0.11	0.04
Nepal	2001	SA	0.03	0	0.23	0.07	1.27	0.08	0.00
Netherlands	2010	EU	0.65	0.48	0.15	0	0.79	0.11	0.06
New Zealand	2008	EAP	0.54	0.52	0.12	0	0.81	0.09	0.05
Nicaragua	2010	LAC	0.72	0	0.29	0.07	0.93	0.14	0.05
Niger	2005	SSA	0.50	0	0.62	0.02	1.48	0.23	0.00
Norway	2010	EU	0.64	0.75	0.10	0	0.74	0.09	0.06
Oman	2000	MENA	0.69	0.31	0.84	0	0.79	0.33	0.06
Pakistan	2008	SA	0.98	0.70	0.74	0	1.05	0.30	0.10
Panama	2008	LAC	0.51	0.32	0.40	0	0.97	0.17	0.04
Paraguay	2010	LAC	0.55	0	0.39	0.04	0.99	0.16	0.03
Peru	2008	LAC	0.55	0	0.16	0.06	0.97	0.09	0.03
Philippines	2008	EAP	0.54	0.17	0.37	0	1.00	0.16	0.04
Poland	2010	EU	0.50	0.41	0.18	0	0.85	0.10	0.04
Portugal	2010	EU	0.59	0.22	0.12	0	0.85	0.08	0.05
Qatar	2007	MENA	0.77	1	0.86	0	0.65	0.34	0.08
Romania	2010	EU	0.60	0.56	0.19	0	0.92	0.11	0.06
Russia	2008	EU	0.39	0.36	0.04	0	0.73	0.05	0.03
Rwanda	1996	SSA	0.19	0	0	0.05	1.25	0.01	0.01
Sao Tome	1991	SSA	0.76	0	0.50	0.01	0.93	0.21	0.05
Senegal	1991	SSA	0.91	0	0.16	0.02	1.12	0.09	0.04
Seychelles	1987	SSA	0.27	0.67	0.31	0	0.82	0.13	0.03
Singapore	2010	EAP	0.56	0.60	0.23	0	0.78	0.12	0.05
Slovenia	2010	EU	0.59	0.61	0.15	0	0.78	0.10	0.06
South Africa	2010	SSA	0.63	0.17	0.23	0	0.76	0.12	0.05
Spain	2010	EU	0.51	0.49	0.21	0	0.80	0.11	0.05
Sri Lanka	2009	SA	0.75	0.39	0.47	0	0.98	0.20	0.06
St Kitts and Nevis	2001	LAC	0.64	0.56	0.13	0	0.76	0.1	0.06

	Year	Region group	Empl. gg	Self gg	LFP gg	Wage gg	Tau	Total inc. loss from gender gaps	Inc. loss from occup gender gaps
St Vincent and the Grenadines	1991	LAC	0.52	0.34	0.47	0	0.88	0.19	0.04
Suriname	1998	LAC	0.75	0.59	0.52	0	0.86	0.23	0.07
Swaziland	1997	SSA	0.21	0	0.31	0.15	0.84	0.12	0.02
Sweden	2010	EU	0.70	0.68	0.11	0	0.75	0.1	0.07
Switzerland	2010	EU	0.60	0.38	0.16	0	0.74	0.10	0.05
Tanzania	2006	SSA	0.60	0	0	0.03	1.36	0.01	0.01
Thailand	2010	SA	0.60	0.32	0.16	0	1.01	0.1	0.05
Trinidad and Tobago	2005	LAC	0.49	0.42	0.33	0	0.85	0.15	0.04
Tunisia	1994	MENA	0.73	0.47	0.70	0	0.90	0.28	0.07
Turkey	2010	CA	0.81	0.52	0.60	0	0.90	0.25	0.08
Uganda	2003	SSA	0.51	0.24	0	0	1.18	0.03	0.03
United Arab Emirates	2008	MENA	0.80	0.96	0.77	0	0.67	0.31	0.08
United Kingdom	2010	EU	0.60	0.60	0.13	0	0.82	0.1	0.06
Uruguay	2010	LAC	0.53	0.21	0.14	0	0.90	0.09	0.04
Vietnam	2004	EAP	0.57	0.40	0.04	0	1.11	0.06	0.05
Yemen	1999	MENA	0.85	0.35	0.67	0	1.00	0.27	0.07
Zambia	2000	SSA	0.67	0.42	0	0	1.11	0.05	0.05
Zimbabwe	2002	SSA	0.44	0	0.08	0.14	1.08	0.05	0.02