



Full length article

The aggregate gains of eliminating gender and ethnic gaps in the Malaysian labor market[☆]

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ABSTRACT

We use microdata to calculate the gains of eliminating gender and ethnic labor market gaps in Malaysia for the period 2010–2017. We document significant gaps in terms of participation in the labor market and entrepreneurship, distinguishing between employers and self-employed. Female-male ratios are 64% for labor market participation, 82% for self-employment, and 32% for being employers. Across different age and ethnic groups, gender gaps in labor force participation are particularly pronounced for older workers and in entrepreneurship for Chinese workers. Our results indicate substantial income gains if gender and ethnic gaps were eliminated. Eliminating the entrepreneurship gender gaps increases income per capita by 6.54% in the long run. When we also include the employment gender gap, the long-run gains are 26.18%. The elimination of ethnic gaps could in the long run result in a smaller but still sizeable increase in income per capita of 11.5%.

1. Introduction

In recent years, several papers have calculated the macroeconomic costs associated with gender gaps in the labor market (see, for example, [Cavalcanti and Tavares \(2015\)](#) and [Cuberes and Teignier \(2016\)](#)). On the other hand, some other works have also used the concept of misallocation of inputs to calculate the costs of ethnic labor market gaps ([Hsieh, Hurst, Jones, & Klenow, 2019](#)).

In this paper we calculate the economic gains of eliminating gender and ethnic labor market gaps in Malaysia for the period 2010–2017. More specifically, we focus on gaps in terms of employment, in general, as well as entrepreneurship. The calculations of gender gaps are also carried out for different age groups and different ethnic groups using the same methodology as [Cuberes and Teignier \(2016, 2019\)](#).

Malaysia is a particularly interesting case for the investigation of gender and ethnic labor market gaps. Over the last decades, profound structural changes and sustained labor productivity growth have transformed Malaysia from a low-income rural and agrarian society to a largely urban and industry- and service-based economy at the cusp of high-income status ([Abdur Rahman & Schmillen, 2023](#)). At the same time, gender and ethnic labor market gaps continue to be observed and knowledge with regard

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to the extent, drivers and consequences of these gaps remains incomplete, partly due to limited availability of relevant micro-data (Lee, 2012).

As documented by Lim (2019) and World Bank (2019), women in Malaysia have traditionally faced significant labor market challenges, partly due to gender norms and attitudes but also due to a legal environment that is not fully aligned with international best practices. In addition, World Bank (2019) argues that there have been practical hurdles to women's labor market success such as a lack of good-quality and affordable childcare facilities. In spite of notable progress and a set of proactive government policies also highlighted by Lim (2019) and World Bank (2021), significant gender gaps in labor force participation persist. As gaps in unemployment rates between men and women have been relatively small (according to the Department of Statistics Malaysia, in 2020, the unemployment rate was 4.7% among women and 4.4% among men), the gaps in labor force participation rates have translated almost directly into gaps in employment rates.

Schafgans (2000) surveys the early literature on men's and women's wages in Malaysia covering the period from 1957 to 1987 and adds relatively more recent findings using semiparametric estimation techniques. She finds significant gender wage gaps which – at least for Malaysia as a whole – cannot entirely be attributed to observable differences in productive characteristics between men and women. Milanovic (2006), Seshan (2013), and Ismael, Farhadi, and Wye (2017) confirm the presence of significant gender wage gaps. Ismael et al. (2017) also show a high degree of occupational segregation between genders. Relatedly, Ming and Siong (2014) demonstrate that women in Malaysia face specific challenges in becoming entrepreneurs — such as cultural barriers, relatively weak networks and a lack of spousal support.¹

The literature has also documented a number of ethnic gaps in Malaysia's labor market. Ravallion (2020), p. 1) explains that at Malaysia's independence in 1957 the country's "colonial legacy had left large, unaddressed, ethnic disparities and an especially high incidence of poverty among the ethnic majority, the Malay people and other (non-Malay) 'Bumiputera.'" In addition to the Bumiputera, Malaysia's other main ethnic groups are those with "Chinese" and "Indian" origins. Both Ravallion (2020) and World Bank (2021) chronicle how relative between-group inequality has declined dramatically in recent decades. At the same time, some noteworthy ethnic gaps in average incomes and also poverty rates still persist. For instance, according to World Bank (2021), in 2004, the poverty rate for Bumiputera households stood at 26.3%, for Indians at 12.7%, and for Chinese at 4.6%. By 2016, these rates were 3.2%, 1.2% and 0.4%, respectively.

Malaysia's ethnic labor gaps have been the target of public policies in areas such as higher education, public sector recruitment or entrepreneurship development ((Lee, 2012) and (World Bank, 2021)). Both Schafgans (1998) and Milanovic (2006) document that average wages among Chinese workers are significantly higher than among Malay workers. However, whereas according to Schafgans (1998) the wage gap can entirely be attributed to observable differences in productive characteristics between the two groups of workers, based on Milanovic's (2006) approach this is not entirely the case. Nevertheless, Milanovic (2006), p. 210) cautions that "it would be rash to conclude that the premium enjoyed by the Chinese necessarily denotes some 'pro-Chinese' discrimination". Instead, he conjectures that this premium might plausibly be attributable to the lack of data to control for all relevant productive characteristics of workers — such as in particular the quality of education. In fact, Lee (2012) argues that the comparatively low quality of some public higher education institutions with a largely Bumiputera student body might constrain the labor market prospects of Bumiputera graduates from such institutes.

With regard to public sector recruitment, Fang and Norman (2006) theoretically and empirically investigate the impacts of giving certain ethnic groups preferential access to public sector jobs, as practiced during Malaysia's New Economic Policy (NEP) in the 1970s and 1980s. The authors show that the NEP might have had the unintended consequence of cementing ethnic labor market gaps by incentivizing Chinese who faced difficulties in accessing public sector jobs to invest in skills that the private sector rewarded with higher wages.²

Gomez (2012), Chin and Teh (2017), and World Bank (2021) discuss the topic of ethnicity and entrepreneurship. These papers document how at the outset of Malaysia's independence Bumiputera were underrepresented among owners of private businesses of all sizes, how this underrepresentation has declined but not disappeared in recent decades, and how public policies have promoted entrepreneurship among Malays and other Bumiputera. Whereas Chin and Teh (2017) argue that these policies have significantly contributed to the emergence and consolidation of Bumiputera entrepreneurs, Gomez (2012) and World Bank (2021) contend that while policies might have been well-formulated and achieved social objectives, they might not have always promoted productive and accountable entrepreneurship.

Building on the relevant literature, this paper's contributions include a relatively more in-depth investigation of ethnic and gender gaps in Malaysia made possible by the use of detailed micro data, a quantitative estimation of the impacts that would result from eliminating these gaps based on the methodology of Cuberes and Teignier (2016, 2019), and the analysis of the interplay of ethnic and gender gaps. With a few notable exceptions such as Schafgans (1998, 2000), Amin (2004), Lee and Choong (2019), and Clark, Ogawa, Mansor, Abe, and Mahidin (2021) this interplay has received scant attention in the literature.

¹ There is a vast literature documenting the presence of gender gaps in the labor market in both developing and developed countries. Women are often underrepresented in the labor force in general, but especially in entrepreneurial occupations. See the World Development Report 2012 (World Bank, 2012) for a comprehensive review of these and other gender gaps.

² Importantly, in Fang and Norman (2006) model it is possible that the group with preferential access to public sector jobs is, on average, economically less successful even when the public sector offers the highest average wage rate as long as the probability of obtaining a public sector job for this group is sufficiently small. See also Gang and Schmillen (2017) who similarly suggest that Kazakhstan's policy of "Kazakhization" meant to favor the economically disadvantaged ethnic Kazakh majority might have had the unintended consequence to have induced the ethnic Russian minority to move into private sector jobs that turned out to be superior to the public sector jobs often held by Kazakhs.

Table 1
Average female-male ratios in 2000–2017.

Employers	Self-employed	Labor force part.
0.32	0.82	0.64

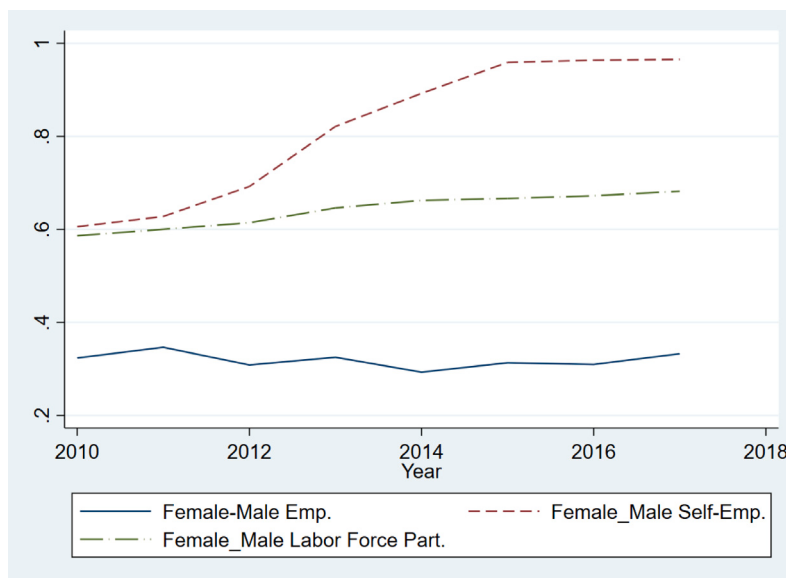


Fig. 1. Female-male ratios over time.

The paper is organized as follows. In Section 2 we report descriptive statistics and trends on the female-to-male ratios in Malaysia, both in the aggregate and by age and ethnic groups. The theoretical model is sketched in Section 3 and Section 4 discusses the model simulation. The calculations of the income gains associated with eliminating gender and ethnic gaps are discussed in Section 5. Section 6 considers robustness checks such as including only Malaysian citizens and using alternative values for the theoretical model's parameters. Section 7 concludes.

2. Data description

The data used in the paper are from the Labour Force Survey 2010–2017, Department of Statistics Malaysia.

2.1. Aggregate gender ratios

Among those employed in the Malaysian labor market, the share of employers is 3.73% and the corresponding share of the self-employed is 16.91%. Table 1 displays the average gender ratios for employers, the self-employed, and the entire labor market during the 2010–2017 period. We can see from the table that these ratios are clearly below one for employers (0.32) and much closer to parity (0.82) for the self-employment. The ratio of women to men in employment is between these two (0.64).

Fig. 1 shows the time series of the female-male shares (or ratios) for every year for employers and the self-employed, and for employment overall. Interestingly, the time series for the labor force participation ratios and the ratio of employers show a very constant evolution. On the other hand, we observe a marked increase in the ratio for the self-employed since 2011 (as also documented in World Bank (2019)).

2.2. Gender ratios by age group

In this section we divide our observations into four age groups. The first group corresponds to individuals with ages between 15 and 25 (31.8% of the sample), both included. The second group comprises ages between 26 and 35 (25.8%). The third bracket is for individuals with ages between 36 and 50 (26.5%). Finally, the last group includes individuals aged 51 or older (15.8%).

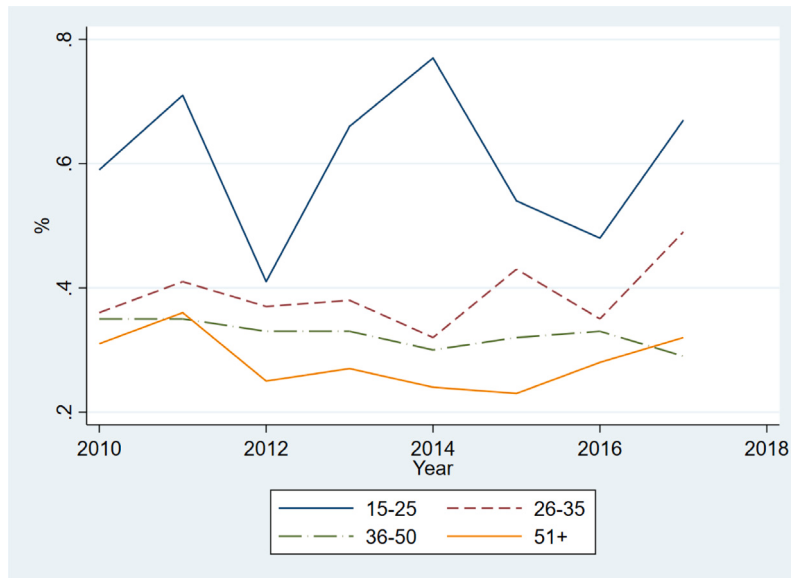
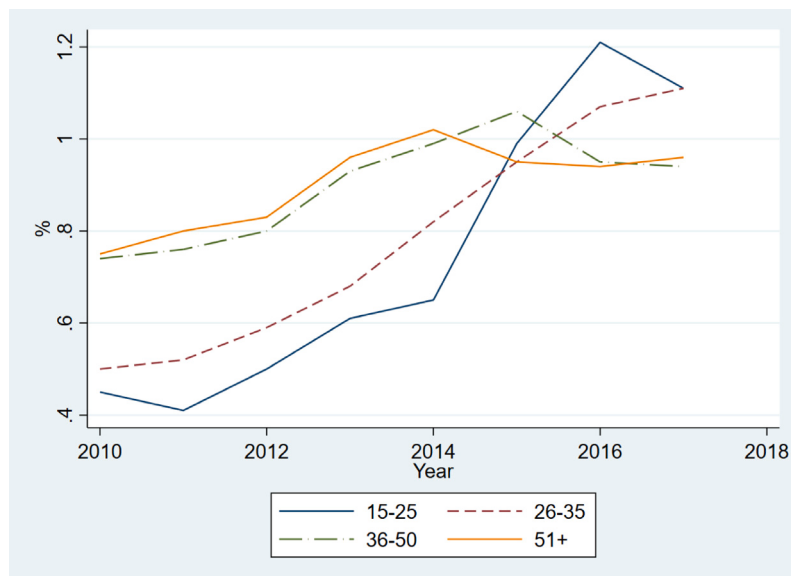
Table 2 shows the female-male ratios in these three age groups as an average for the 2000–2017 period and Figs. 2 and 3 display the evolution of these gaps over time. For employers and labor force participation overall, the lowest ratios are for age 51 and above (0.28 and 0.48). Interestingly, for self-employment, the lowest ratio (0.74) is for the youngest age group.

Fig. 2 reveals that all the employer ratios are quite constant over time, with the youngest group experiencing high volatility, probably because a large fraction of these individuals are full-time students. For self-employment (Fig. 3) we observe a clear increase for all age groups over time. A positive but milder trend is also observed for the labor force participation ratios (Fig. 4).

Table 2

Average female-male ratios by age.

	Employers	Self-employed	Labor force part.
Age 15–25	0.60	0.74	0.68
Age 26–35	0.39	0.78	0.71
Age 36–50	0.32	0.90	0.63
Age 51 and above	0.28	0.90	0.48

**Fig. 2.** Employers gender ratios over time by age.**Fig. 3.** Self-employment gender ratios over time by age.

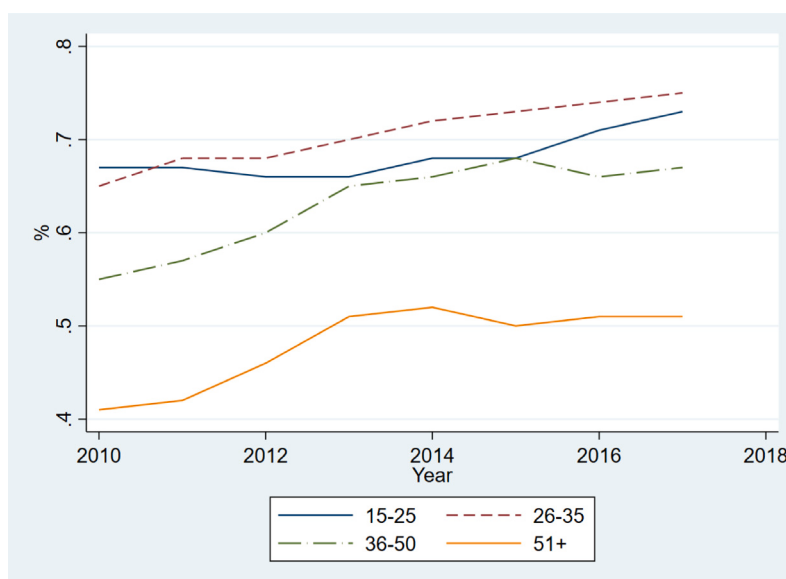


Fig. 4. Labor force participation ratios over time by age.

Table 3

Average gender female-male ratios by ethnic group.

	Employers	Self-employed	Labor force part.
Bumiputera	0.43	0.81	0.64
Chinese	0.21	0.60	0.67
Indian	0.27	0.78	0.59
Others	0.51	1.33	0.66

2.3. Gender ratios by ethnic groups

This section reports the female-male ratios for the different Malaysian ethnic groups: Malays and other Bumiputera (58.6% of the sample), Chinese (22.4%), Indians (7.1%), and *Others* (11.9%).³

Table 3 displays the occupational gender ratios by ethnic group and Figs. 5–7 show their evolution over time. Consistent with our previous findings, the gender ratios are smallest for employers for all ethnic groups. In addition, the ratios for employers and self-employment are smallest for the Chinese. This implies that Chinese men are relatively more likely to become entrepreneurs or self-employed than Chinese women, as compared to what is observed for Bumiputera or Indians. In terms of labor force participation ratios, differences across ethnic groups are relatively muted; the relatively largest gap between men and women is observed for Indians.

The time series of the employer ratios are quite constant over time and they display a very volatile pattern for the group *Others*. For the self-employed there is a mild positive trend in the ratios for all ethnic groups, especially *Others*, although this group experienced a drop in the ratio in 2016. Finally, the labor force participation ratios are increasing over time for all groups. This suggests that for all four ethnic groups the gaps in labor force participation between men and women have been declining.

3. Summary of the theoretical model

In this section, we present a brief summary of the framework developed in Cuberes and Teignier (2016). The paper presents 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 firm workers. Agents choosing to become firm workers earn the equilibrium wage rate w – which is assumed to be independent of their entrepreneurial talent – while entrepreneurs earn the profits generated by the firm they manage. An agent with entrepreneurial talent or productivity level x who chooses to become an employer hires $n(x)$ units of labor and $k(x)$ units of capital. She then 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

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

³ The group *Others* refers to a small and diverse category comprising Thais, Eurasians and various other ethnicities (Ravallion, 2020).

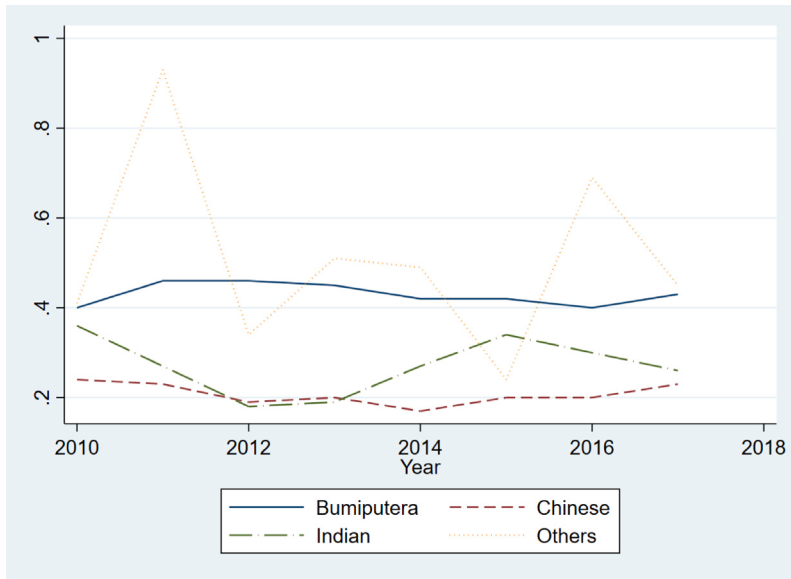


Fig. 5. Employer gender ratios by ethnic groups over time.

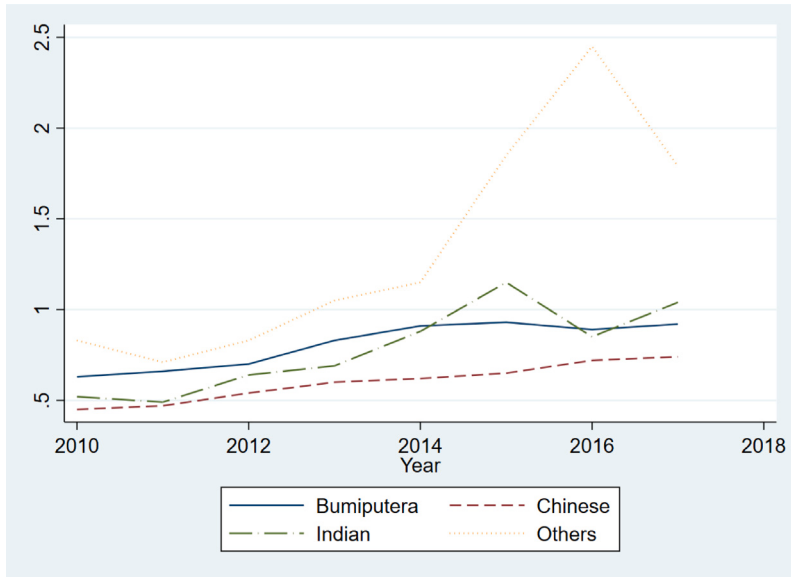


Fig. 6. Self-employed gender ratios by ethnic groups over time.

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, an agent with talent x who chooses to become self-employed uses the amount of capital $\bar{k}(x)$, produces $\bar{y}(x)$ units of output, and earns profits $\bar{y}(x) - r\bar{k}(x)$. The technology she operates is $\bar{y}(x) = \tau x (k(x))^{\alpha\eta}$, where τ is the self-employed productivity parameter. One interpretation of this parameter is that self-employed workers have to spend a fraction of their time on management tasks, which would imply that τ is equal to the fraction of time available for work to the power $(1 - \alpha)\eta$. As explained below, we estimate this parameter to match the average fraction of self-employed in the data.

Fig. 8 plots the payoff of the three occupations at each talent level. For the employers and self-employed, the profit functions, π , use the subscripts e and s , respectively. This figure shows that in this model agents with the highest entrepreneurship skill (those with a talent equal or larger than z_2) optimally choose to become employers, whereas those with the least skill become workers (with a talent lower than z_1), leaving the self-employed occupation to agents with intermediate skill levels.

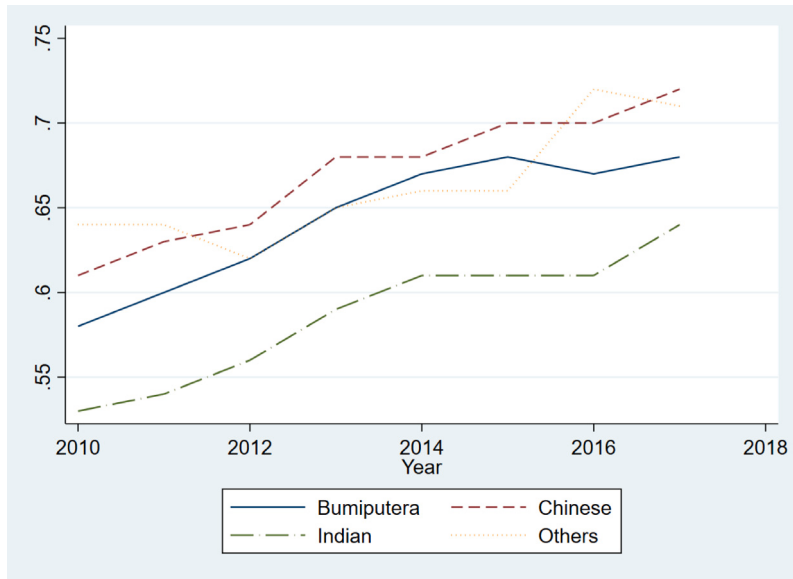


Fig. 7. Labor force participation gender ratios by ethnic groups over time.

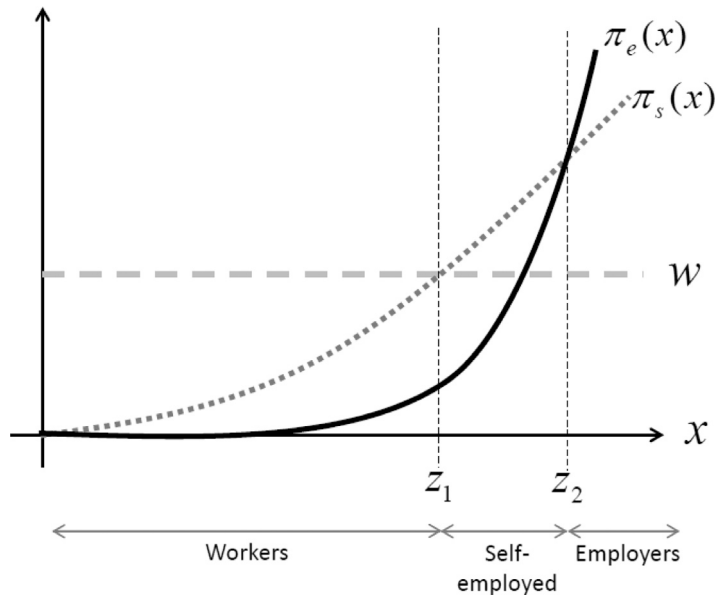


Fig. 8. Occupational map.

We also allow for the possibility of the so-called out-of-necessity entrepreneurs, who choose this occupation because they had no other choice. To capture this phenomenon, in the model, a fraction $1 - \theta$ of both males and females are not allowed to become workers and become self-employed instead.

The model assumes that men and women are identical in terms of their managerial skills. However, women are subject to several exogenous constraints in the labor market. First, a fraction $1 - \lambda$ of women are entirely excluded from participating in the labor market. On top of that, among the participants, a fraction $1 - \mu$ of women who would like to be employers are excluded from this occupation, while a fraction $(1 - \mu)(1 - \mu_0)$ of women are also excluded from self-employment. Importantly, in our framework all women have the same probability of facing these constraints, implying that there is no positive or negative selection into participation or entrepreneurship. Admittedly, the effects of the gender gaps on income would be smaller if excluded women had, on average, lower talent, while they would be larger if they had higher talent.

The restriction on the female employment mechanically results in a reduction in output per capita because the amount of productive inputs falls. The restrictions altering the occupational choice, on the other hand, reduce the average talent of

entrepreneurs, which leads to a fall in productivity and income per capita. The intuition behind the reduction in productivity is as follows. Assume a woman with very good management skills happens to be excluded from becoming an employer. The model then implies that a less skilled man will take her position and become the manager of a firm. Notice that, if this man has a lower managerial skill than the woman who is not allowed to become a manager, he will run a smaller firm — due to the nature of the span-of-control technology. This would then have general equilibrium implications in terms of the amount of output produced, wages and firms' profits. It is easy to show that output/income per worker and per capita would be lower in this economy as a result of this restriction. We measure this loss by taking the ratio between output per capita with no gender gaps and the corresponding output per capita given the observed gender gaps.⁴

4. Model simulation

To simulate the model, we use a Pareto function for the entrepreneurial talent distribution, as in Lucas (1978) and Buera, Kaboski, and Shin (2011). In particular, the cumulative distribution of talent is given by

$$\Gamma(x) = 1 - B^\rho x^\rho, x \geq 0$$

where $\rho > 0$, and $B > 0$.

In terms of parameter values, B is normalized to 1, η is set to 0.79 from Buera and Shin (2011), the capital–output elasticity parameter α is set to 0.114 in order to get a capital income share of 30%, ρ is set to 6.5 to match the fraction of employers in the OECD countries (which is 4.5% on average), and, finally, τ is chosen to match the fraction of self-employed workers in the OECD countries (which is 10.8% on average). All these parameter values are the same parameters as those used in Cuberes and Teignier (2016). The value of the parameter θ is set to 0.96, implying that about 4% of those who want to be workers end up working as self-employed. This gives a share of necessity entrepreneurs (in the total of entrepreneurs) of 14.17%, which is the average in Malaysia for the period 2010–2016 according to the Global Entrepreneurship Monitor.

When computing the long run numerical results in the next section, we let the capital stock adjust to its steady-state value, which we compute using a gross interest rate of 0.125. This is consistent with a depreciation rate of 0.075 and an intertemporal discount factor of 0.05 in a continuous-time model.

5. Numerical results: Income gains from removing gender and ethnic gaps

In this section we calculate the gains in terms of income per worker and income per capita that would be associated with reducing or removing the gender and ethnic labor market gaps. We first look at gender gaps for the aggregate economy and we then decompose the aggregate gain from removing gender gaps by age and ethnic groups. Subsequently, we look at the income gains from eliminating ethnic gaps.

As we explain above, we use the female-to-male ratios described in Section 2 to calibrate the corresponding barriers for women to become employers or self-employed. Our calculations give us, on average over the 2010–2017 period, $\mu = 0.31$, $\mu_0 = 0.51$, and $\lambda = 0.66$. We also find that there is about 5% of the workforce who cannot find a job as workers and try to become self-employed. This, together with the increase in the parameter λ and the increase in the parameter μ_0 , imply that the number of self-employed women has increased significantly relative to men during the sample period.

5.1. Aggregate gains from reducing gender gaps to the lowest-gap group

In our first numerical exercise, we compute the gain in aggregate income of reducing the gender gaps for all ethnic groups to the lowest one observed in the data. As we can see in Table 3, the ethnic group Bumiputera have the lowest gender gaps in entrepreneurship, while the ethnic group Chinese have the lowest gender gap in terms of employment.⁵ The differences among groups are not very large, especially for the gender gaps in labor force participation, which implies that the aggregate gains will be small compared to other numerical exercises we perform.

In particular, for each year, we set the entrepreneurship gender gaps parameters for the Chinese and Indian ethnic groups to the level of the Bumiputera group and the labor force participation gender gap parameter of the Bumiputera and Indian to the level of the Chinese group. When doing that, we find an average increase in income per capita of 2.15% in the short run and 2.4% in the long run, and an average increase in income per worker of 0.8% in the short run and 1% in the long run.

⁴ Indeed in what follows we report the *gains* associated with removing these gaps.

⁵ The group *Others* has the lowest gender gaps for some years, but since the data for this group are very noisy, we prefer not to use the numbers observed for this group as a reference for the other groups.

Table 4
Aggregate income gains from eliminating the gender gaps (in %).

	Short run		Long run	
	Entrep. gaps (%)	All gaps (%)	Entrep. gaps (%)	All gaps (%)
Y/P	5.94	23.66	6.54	26.18
Y/N	5.31	2.22	5.92	4.38



Fig. 9. Long run gains over time.

5.2. Aggregate gains from eliminating all gender gaps

In this second numerical exercise, we compute the gain of eliminating the barriers we estimate using our theoretical framework. Table 4 shows the gains in income per capita and income per workers. In terms of income per capita (Y/P), the gain of eliminating the entrepreneurship gaps (which includes both the employer and the self-employed gaps) is 5.94% in the short run and 6.54% in the long run. When we also include the labor force participation gap, the gain is obviously much larger, 23.66% in the short run and 26.18% in the long run. These figures are quite similar if we consider output per worker instead (Y/N), in the case of entrepreneurship gaps, but they are smaller when all the gaps are considered.⁶

Fig. 9 displays the evolution of the short run and long run gains in income per capita (Y/P).⁷ It is apparent that these gains are significant throughout the investigation period but that they also decline over time. This is due to the gradual decline in the relevant gaps, especially those associated with differences in men's and women's employment rates as more and more women have been entering the labor force (World Bank, 2019).

5.3. Decomposing the income gains from eliminating gender gaps

5.3.1. Age decomposition

In this section we calculate the gains associated with removing the labor market barriers that women face in each age group (Table 5) and show their evolution over time.⁸ The lowest gains are those that correspond to the youngest age group (15–25). This is mostly a result of the fact that this age group represents a small share of the employed population. The largest gains are for individuals between 36 and 50 years of age. These gains for different age groups are quite stable over time, as is apparent from Fig. 10.

⁶ When computing the gains of removing the entrepreneurship gaps, we compare output per worker when there are only entrepreneurship gaps with output per worker when there are no gender gaps, i.e. we are computing the gains of removing the entrepreneurship gaps as if we had first removed the labor force participation gaps. Since output per worker when all the gaps are present is larger than output per worker when only the entrepreneurship gaps are present we obtain larger productivity gains when only removing the entrepreneurship gaps than when removing all the gender gaps.

⁷ In all our calculations, the level and the evolution of the short run and long run gains are very similar, so we only display the evolution over time of the long run gains for the sake of brevity.

⁸ To save space in this subsection we only show the income per capita gains and not the income per worker gains.

Table 5
Decomposition of income gains by age group (in %).

	Short run	Long run
Age 15–25	15.17	15.14
Age 26–35	23.82	23.81
Age 36–50	37.89	37.93
Age 51 and older	23.12	23.11

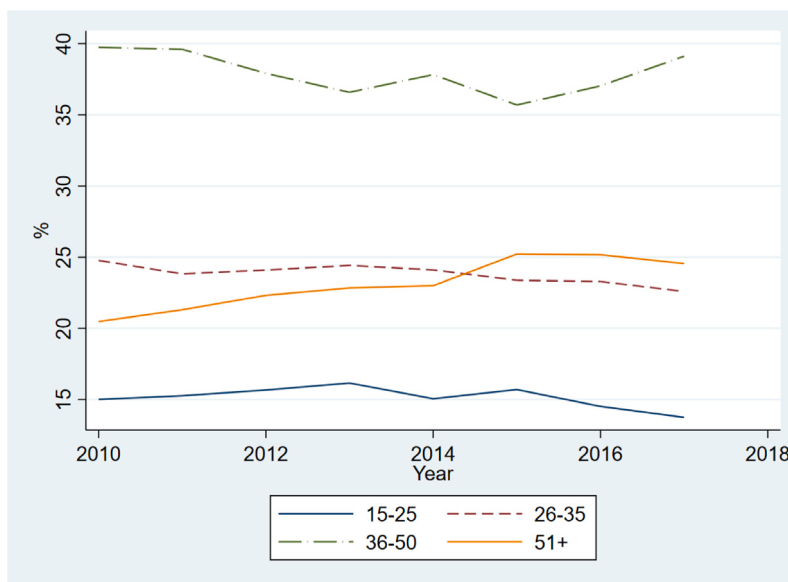


Fig. 10. Decomposition of long-run income gains from eliminating gender gaps by age group (in %).

Table 6
Decomposition of income gains by ethnic group (in %).

	Short run	Long run
Bumiputera	52.47	52.56
Chinese	29.31	29.29
Indian	8.70	8.67
Others	9.51	9.48

The importance of each group in explaining the overall gains from removing gender gaps depends not only on the magnitude of the gender gaps within that group but also on the size of the group. To illustrate this point, we repeat the exercise in [Table 5](#) under the counterfactual assumption that each group had the same size (i.e. that male employment in each group was 25% of the total). We find that in this counterfactual scenario the age group 15–25 would be responsible for 16% of the gains, the age group 26–35 for 15%, the age group 36–50 for 29%, and the age group 51+ for 39%. These findings suggest that a policy approach to reduce gender gaps in the labor market would need to address the constraints faced by women of all age groups, especially relatively older women.

5.3.2. Ethnic decomposition

In this section we report the income per capita gains of eliminating gender gaps in each of Malaysia's four ethnic groups. [Table 6](#) shows that the largest gains could be generated by eliminating gender gaps in the Bumiputera ethnic group, followed by the Chinese group. The macroeconomic gains of removing the barriers that Indian and *Other* women face would be much more modest. [Fig. 11](#) shows that there are no clear trends in these gains over time.

Again, the importance of each group in explaining the overall gains from removing gender gaps depends not only on the magnitude of the gaps within that group but also on the size of the group. If each group had the same size (i.e. if male employment in each group was 25% of the total), 28% of the gains would be attributable to the Bumiputera group, 35% to the Chinese group, 30% to the Indian group, and 5% to the *Others* group. This means that with the exception of the small and diverse *Others* group, conditional on group size gains from eliminating gender gaps would be quite uniform across ethnic groups.

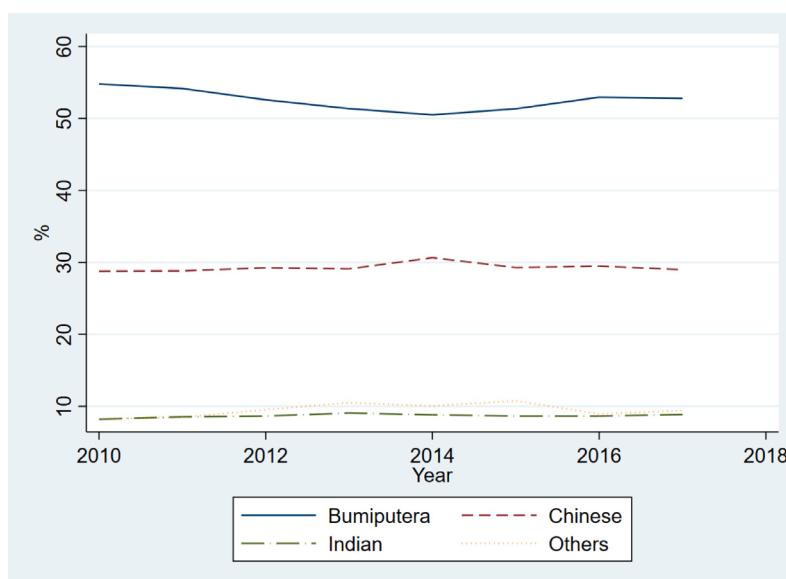


Fig. 11. Decomposition of long-run income gains from eliminating gender gaps by ethnic group (in %).

Table 7

Income gains from eliminating gaps between Chinese and non-Chinese (in %).

	Short run		Long run	
	Entrep. gaps (%)	All gaps (%)	Entrep. gaps (%)	All gaps (%)
Y/P	10.39	10.4	11.47	11.49
Y/N	9.49	9.49	10.57	10.57

5.4. Aggregate gains from eliminating ethnic gaps

Consistent with what has been documented for generally larger companies by Gomez (2012), our data show that the Chinese ethnic group is comparatively over-represented in entrepreneurship. In particular, while the share of employers among Chinese is above 8%, it is less than 2.5% for the rest of the population. While necessarily an abstraction from Malaysia's complex ethnic setup and associated policies briefly sketched in Section 1, it is nevertheless an interesting thought experiment to explore the gains that would be associated with the elimination of the gap in the share of employers and of all labor market gaps between the Chinese and non-Chinese.

Table 7 reports the findings from this thought experiment. The table shows that at least potentially the gains from eliminating ethnic labor market gaps could be substantial. On average during the 2000–2017 time period, eliminating ethnic gaps in entrepreneurship ratios would increase income per capita by about 10.4% in the short run and 11.5% in the long run. The figures are slightly smaller if one considers income per worker instead and hardly change of gaps in labor force participation ratios are considered as well. Fig. 12 shows the evolution of the gains from removing the entrepreneurship and overall gap over time. The figure reveals that these lines are quite volatile although one can observe a substantial increase in the potential gains since 2015.

6. Robustness checks

6.1. Sub-sample of Malaysian citizens only

In this section, we re-calculate the gains of removing gender barriers to employment and entrepreneurship using data only on Malaysian citizens. The percentage of Malaysian citizens in our sample is 94.3%. However, it is possible that the labor market status of the non-citizens is quite different than that of citizens. To explore this, in this section we eliminate all non-citizens from the sample. Table 8 displays the short and long run gains associated with eliminating the gender gaps in the sample that only includes citizens. The gains reported here are slightly larger than those of the entire sample (Table 4), but the differences are quite small.

Table 9 shows the results by age group. Again, the average gains associated with eliminating the gender gaps for each age group are very similar to the ones using the entire sample (Table 5).

Finally, in Table 10 we show the gains from reducing gender barriers for the different ethnic groups for the reduced sample. These gains are very similar to those using the entire sample (Table 6). The only significant difference with regard to our baseline

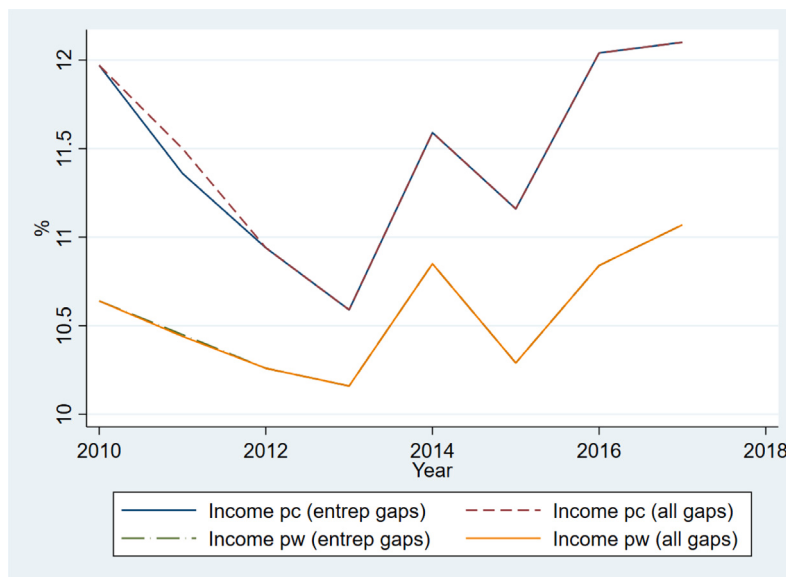


Fig. 12. Long run income gains from eliminating gaps between Chinese and non-Chinese (in %).

Table 8

Income gains from eliminating the gender gaps (in %) (Malaysian citizens only).

	Short run		Long run	
	Entrep. gaps (%)	All gaps (%)	Entrep. gaps (%)	All gaps (%)
Y/P	6.46	24.4	7.12	27.12
Y/N	5.79	2.57	6.45	4.81

Table 9

Age group decomposition of the income gains from removing gender gaps for Malaysian citizens (in %).

	Short run	Long run
Age 15–25	12.85	12.78
Age 26–35	23.44	23.31
Age 36–50	39.02	39.18
Age 51 and older	24.68	24.72

Table 10

Ethnic group decomposition of the income gains from removing gender gaps for Malaysian citizens (in %).

	Short run	Long run
Bumiputera	60.36	60.45
Chinese	31.22	31.17
Indian	7.75	7.72
Others	0.67	0.67

estimates is for the category *Others*, for which the average gains are now much smaller (0.67%) than when we use the entire sample – in Table 6 – in which case the average gains were around 9.5%. This is mostly due to the fact that in the data a large fraction of individuals in the ethnic group *Others* are non-citizens.

6.2. Adjusting the parameter ρ and θ to match the fraction of employers and self-employed

In our simulation, the parameter ρ , which measure the dispersion of the talent distribution, is crucial to determine the income gains associated with the removal of female-male gaps. Another important parameter is θ , which measures the fraction of women that are self-employed “out-of-necessity”. It is possible to match the exact share of employers and self-employed observed in the

Table 11
Income gains from eliminating the gender gaps (in %) (adjusting ρ and θ).

	Short run		Long run	
	Entrep. gaps (%)	All gaps (%)	Entrep. gaps (%)	All gaps (%)
Y/P	7.28	23.87	8.03	26.52
Y/N	5.49	2.47	6.23	4.66

data by setting ρ to 5.9 and θ to 0.89.⁹ Table 11 shows the income per capita gains associated with this calibration of the model for the aggregate data. The main result of doing this is that the average gains increase, especially for the entrepreneurship gender gaps, but not in a dramatic way. This can be seen by comparing Table 11 with Table 4.¹⁰

7. Conclusions

In this paper we use microdata to study the Malaysian labor market. We explore gaps between women and men in terms of participation and entrepreneurship, distinguishing between employers and the self-employed. We also explore gaps between different ethnic groups. We first document the female-male labor force participation and entrepreneurship ratios and then use the occupational model by Cuberes and Teignier (2016, 2019) to calibrate the aggregate gains that would be associated with the removal of gender gaps. We carry out our calculations for different age and ethnic groups and also investigate the interplay between gender and ethnic labor market gaps.

Overall our results indicate that there would be substantial gains in both income per capita and income per worker if gender and ethnic labor market gaps were eliminated. Gaps from removing gender gaps would be particularly sizeable: our results imply that closing gaps between men's and women's participation in employment and entrepreneurship could in the long run boost Malaysia's income per capita by 26.2%. About a fourth of this boost in income per capita could be realized by eliminating gaps in the share of employed men and women that become entrepreneurs (either as employers or self-employed), and the remainder by putting an end to gaps in employment participation between men and women. Based on our stylized thought experiment, the elimination of ethnic gaps could in the long run result in a comparatively smaller but still sizeable increase in income per capita of 11.5%.

These results are consistent with a number of findings by the existing literature. In particular, they confirm the continued importance of gender gaps in labor force participation also documented by Lim (2019) and supplement the qualitative assessment of women's barriers to entrepreneurship by Ming and Siong (2014) with quantitative data. In addition, they are also consistent with the finding by Ravallion (2020) and World Bank (2021) that in spite of dramatic progress some economic indicators still show noteworthy gaps between ethnicities. As compared to the existing literature, we also break new ground through a relatively more in-depth investigation of gender and ethnic gaps in Malaysia, through a quantitative estimation of the impacts that would result from eliminating these gaps, and through the analysis of the interplay of ethnic and gender gaps.

Our results have important implications for policy and future research. By underscoring the conclusion by World Bank (2019, 2021) that the promotion of women's participation in employment and entrepreneurship can be one of the most promising avenues for fostering Malaysia's future development, they lend support to the reform agenda recommended by World Bank (2019). Relevant recommendations include expanding child and aged care with a prioritization of public resources for families in the bottom 40 percent of the income distribution. In addition, there is room to further improve the productivity of entrepreneurs (in particular female entrepreneurs) through the strengthening, simplification and consolidation of financing and training provided to women-owned and -operated businesses (also see Ming and Siong (2014)) and to reform the legal environment so that it is even more fully aligned with international best practices. Relevant legal reforms could include mandating nondiscrimination in employment based on gender and equal remuneration for work of equal value, prohibiting the dismissal of pregnant women, and expanding parental leave entitlements.

Given Malaysia's complex ethnic setup and associated policies, it would appear premature to derive similarly tangible policy recommendations from our thought experiment regarding the impacts of eliminating ethnic labor market gaps on income per capita. Instead, it seems more appropriate to point to this topic as one that would deserve the attention of future research. In broad terms, this future research might also be guided by the observations by World Bank (2021, p. 168 and p. 170) that "the affirmative action policies that may have contributed to inclusion in the past may not be sufficient or appropriate going forward as a high-income and developed economy" and that "[a]t one time, given the nature of inequities in Malaysia and the government's more limited administrative capacity, group-based criteria, such as ethnicity [...], may have been justified when determining eligibility for [...] favored access to public services. That case is much harder to make today".

Declaration of competing interest

The authors have no conflicts of interest to declare.

⁹ With this value of θ , the share of necessity entrepreneurs among all entrepreneurs is almost 50%.

¹⁰ The same is true for any of the other decompositions that we carry out in the paper.

Data availability

Data will be made available on request.

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