Rooted Decisions: Childhood Exposure to Labor Markets and Women's Work*

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Abstract

This paper argues that women's birthplace strongly affects their labor force participation in adulthood. I use rich data from Indonesia and leverage variation from women moving across local labor markets as children to estimate the effect on women's labor force participation of spending more time in their birthplace. My strategy compares the labor supply choices of women who currently live in the same location but who emigrated from their birthplace at different ages. I find that birthplace has strong and persistent effects on adult women's labor supply. Moreover, these effects are concentrated during the formative period between 6 and 14 years old. By the time they turn sixteen, women born in a location at the 75th of female employment will be 5 percentage points more likely to work than those born in a 25th percentile location. Birthplace effects are quantitatively important. Approximately 23 percent of the current spatial inequality in women's labor force participation is transmitted to the next generation of women.

Keywords: gender inequality, local labor markets, place effects

JEL Codes: J16, R19, O18

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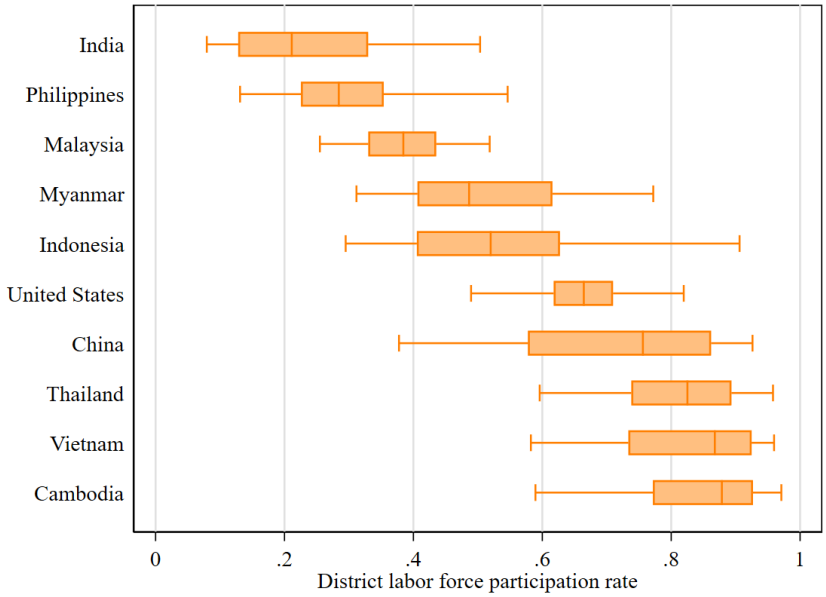
1 Introduction

There are surprisingly large and persistent differences in female labor force participation (FLFP) rates within multiple countries at different levels of development. I show this in figure 1, where I illustrate the high dispersion in subnational FLFP rates within several developing countries and the United States. The FLFP rate gap between two localities within these countries is as large as 15 percentage points (p.p.) for most of them.[1] This large within-country dispersion in FLFP has generally gone unnoticed in the literature (Charles et al., 2023), and, as a consequence, we know very little about its causes and implications for women's outcomes. Particularly, there is scarce evidence of whether being exposed in localities with high or low participation of women in the labor market affects women's labor choices in adulthood. Consequently, we have limited insight into the extent to which current disparities are a constant feature of these localities or whether they can be transmitted across generations.

Figure 1: Female labor force participation rates at the district level for selected countries



Note: The figure shows the distribution of female labor force participation rates for a large subset of Asian countries with geographic data available in IPUMS International and the United States. Countries are ordered by the median rate. I use the latest available sample from IPUMS International for each country. Data is aggregated at the smallest geographical unit available, which often corresponds to a district, county, or municipality, except in the United States where I aggregate data into Commuting Zones as in Autor and Dorn (2013). Data for India comes from the 2010 Indian Census. See appendix table A.1 for data on a larger cross-section of countries, and appendix section C.1 for further details about the cross-country data.

In this paper, I use rich data from Indonesian internal female migrants to show that subnational dispersion in FLFP has strong effects on the labor market outcomes of women born across different

[1] Using the interquartile range as a benchmark, the gap between the localities at the 75th and the 25th percentiles of FLFP rates is over 15 p.p. for 7 out of the 10 countries in the figure. It is 28 p.p. for China, 22 p.p. for Indonesia, and 10 p.p. in the United States.

localities within the same country.[2] I identify the causal effect of the birthplace by leveraging variation from women who live in the same labor market as adults but who left their birthplace at different ages. This approach boils down to comparing the labor supply women who migrated in early childhood versus those who left in their early teens. If women born in places with FLFP are more likely to work the longer they stay there, I infer that this is driven by the effect of exposure to their birth location. Under the assumption that the omitted variable bias is constant for women migrating at different ages, this strategy allows me to distinguish the causal effect of the origin labor market from differences in women's characteristics. In addition, by focusing on the effect of the origin rather than the destination labor market, I uncover variation that is more likely to be driven by women's labor supply choices rather than variation in the structure of labor demand across locations.

Indonesia is an ideal setting to study place effects in women's labor supply because it is a large nation with within-country variation in FLFP similar to other developing countries. Additionally, Indonesia features rich representative datasets that track people's birthplace and current location at a detailed geographic level. My main analyses source data from the 1985, 1995, and 2005 Intercensal Surveys and all waves of the Indonesian Family Life Survey (IFLS) (Central Bureau of Statistics, 2021; Minnesota Population Center, 2023). These datasets track respondents' birthplace, current location, and migration history at a geographic level not available in traditional sources from other countries (Bryan and Morten, 2019). Throughout the paper, I identify localities as Indonesian "regencies," which are administrative geographies akin to counties in the United States. The average regency in my dataset is approximately twice the size of the US state of Rhode Island and houses eight hundred thousand people.

I find that spending late childhood and early teen years in high-FLFP areas makes women more likely to work as adults. Moreover, the longer they stay these locations, the more likely they are to enter the labor force later in life. Under my preferred specification, residing in a place at the 75th percentile of FLFP between the ages of 6 and 14 years old makes women five percentage points more likely to work than those born in a place at the 25th percentile. These magnitudes are quantitatively important as they imply that approximately 23% of the current spatial inequality in women's labor force participation is transmitted to the next generation of women through birthplace effects. In contrast, I do not find similar effects for men. Depending on the specification, staying longer in high-FLFP locations has either no effect or a negative effect on men's employment in adulthood.

These findings highlight the importance of early exposure to the local environment in determining gender disparities in the labor market, even within the same country. They mirror the persistence in fertility decisions found by Fernández and Fogli (2006) and Fernandez and Fogli (2009) for second generation immigrants to the United States, and they highlight that women's labor supply decisions can be influenced by factors present long before they reach working age.

My results are consistent with a setting where birthplace effects act through women adopting

[2]Migration is relatively common in Indonesia, with approximately one in five Indonesians residing outside their birth locality.

or internalizing the norms around women's work from their birthplace. Using data from the Ethnographic Atlas (Murdock, 1967), I show that a regency's FLFP captures variation in pre-modern gender norms within Indonesia. Moreover, the birthplace effects are concentrated during the formative period of late childhood and early adolescence, a time when children's views are settling while still being malleable (Markus and Nurius, 1986). This aligns with evidence that children's views about women's standing in society are susceptible to change during this period (Dhar et al., 2022; Olivetti et al., 2020).

I do not find support for alternative mechanisms highlighted by previous literature: (i) higher investment in schooling, (ii) marriage and household formation, and (iii) changes in parental investment (Molina and Usui, 2022; Fernández et al., 2004; Blau et al., 2011). There is little evidence indicating that women more exposed to high-FLFP locations stay longer in school or that they choose husbands with different characteristics. Moreover, high-FLFP locations have worse schooling outcomes across the board, suggesting that they have lower-quality schooling. In addition, if parental investments were the primary driver behind these outcomes, they would have to occur at a very specific time in the child's life to account for my results. While this is possible, it does not seem very likely.

My estimates assume that omitted variable bias is constant across different ages of migration; that is, the correlation between birthplace FLFP and other unobserved determinants of women's labor supply is the same regardless of the age at which they left their birth location. Note that differences in factors I do not control for between women born in different locations are not sufficient to violate this assumption. For example, women from high-FLFP locations may be more likely to work because their parents had higher resources to invest in their education compared to those born in locations with low female employment. This would create differences between women from different origins that are not driven by birthplace effects. However, such differences do not necessarily violate the constant bias assumption. A violation would require the resource gap to become larger (or smaller) for cohorts of women who migrated at older ages. In the paper, I provide evidence showing that the gap in resources and other covariates remains fairly constant across different ages of emigration, thereby supporting the assumption of my identification strategy.

This paper first lies at the intersection of the culture, and the place effects literatures. Research on culture and gender shows how FLFP and cultural proxies from the countries of ancestry can predict the work and fertility decisions of immigrants in what has been called the "epidemiological approach" to culture (Fernández et al., 2004; Fernandez and Fogli, 2009; Fernández, 2013; Nollenberger et al., 2016). I contribute to this literature by adapting it to study the determinants of within-country variation in women's work choices in a large developing country. Additionally, I extend it using techniques inspired by the place effects literature (Chetty and Hendren, 2018a,b; Milsom, 2023) to show that exposure to one's place of origin during a critical formative period can have a long-lasting effect on women's choices even after the exposure ceased. This complements existing evidence showing that *current* exposure to labor markets can affect women's expectations, labor supply, and educational investment (Molina and Usui, 2022; Boelmann et al., 2021; Milsom,

2023; Moreno-Maldonado, 2019), while also highlighting the rich within-country variation in the determinants of women's choices recently noted in the literature (Charles et al., 2023; Boelmann et al., 2021).

More broadly, this also contributes to the literature showing that where people grow up and live has important implications for intergenerational mobility (Chetty and Hendren, 2018a,b), racial inequality (Chetty et al., 2020), human capital accumulation (Molina and Usui, 2022), criminal activity (Damm and Dustmann, 2014), and political behavior (Brown et al., 2023). I add to this literature by providing new empirical evidence linking women's birthplace to their outcomes as adults in a large developing country. In this way, my findings complement existing work showing that spatial inequality is particularly important for women's human capital investment in West Africa and Japan (Milsom, 2023; Molina and Usui, 2022).

Finally, my paper contributes to the vast literature on the determinants of women's labor supply. This literature has primarily exploited cross-country differences in female labor supply to study its determinants and implications (Olivetti and Petrongolo, 2008, 2014; Blau et al., 2020; Blau and Kahn, 2015). In this paper, I document the existence of large and persistent differences in female labor supply within multiple developing countries and explore some of its implications. In this way, my approach aligns more closely with recent literature documenting that factors such as commuting and sexism can explain geographic differences in women's labor supply within the United States and France (Black et al., 2014; Moreno-Maldonado, 2019; Le Barbanchon et al., 2021; Charles et al., 2023).

2 Data

2.1 Data sources

My main analyses use data from the Indonesian Intercensal Survey (SUPAS) and the Indonesian Family Survey (IFLS). These two datasets record detailed data on people's birthplace, their migration histories, and their labor supply. I supplement it with place characteristics coming from the Indonesian Census, the National Socioeconomic Survey (SUSENAS), and data on traditional practices from the Ethnographic Atlas.

My primary results come from the Intercensal Survey (Central Bureau of Statistics, 1985, 1995, 2005; Minnesota Population Center, 2023). This is a decennial survey containing social and demographic information for approximately 0.5% of the Indonesian population. This dataset has two advantages that make it uniquely suitable to study place effects on female labor supply. First, it records people's birthplace, previous location, and location of birth in midsized geographic units. The survey tracks this information at the level of the "regency", which are administrative units similar to counties in the US. Research on Indonesia typically uses them to identify local labor markets (Magruder, 2013; Bazzi et al., 2023), and their size allows me to study differences in women's employment across smaller geographic units than what could observed in alternative datasets.[3]

[3]Datasets available for other countries track geographic information only for states or provinces, which in most

The typical regency is home to approximately eight hundred thousand people and covers an area roughly twice size of the US state of Rhode Island.[4]

Second, rich data on historical migration patterns allows me to recover the age at which people left their birthplace. Specifically, the survey records the length of time each person has lived in their current location. With this data, I can determine the age at which individuals *who have only migrated once in their lifetime* left their birthplace. These are people whose previous place of residence is the same as their birthplace. This is the key variation that I exploit in my identification strategy.

In addition to these two advantages, the Intercensal Survey also has a sizable sample size of approximately two and a half million people. Its main limitation, however, is that it contains limited demographic information. Therefore I supplement my main results with information coming from the Indonesian Family Life Survey (IFLS). Unlike the Intercensal Survey, the IFLS is a panel that contains rich socioeconomic information, such as childhood conditions and proxy measures of parents' wealth, that allow for the study of potential confounders. However, this comes at the cost of a smaller sample size. The panel tracks approximately 34,000 Indonesians across five survey years: 1993, 1997, 2000, 2007, and 2014. Overall, the IFLS is representative of 83% of the Indonesian population.[5]

I source data on the prevalence of cultural practices by regency from the Ethnographic Atlas (Murdock, 1967). The atlas records data on traditional and pre-modernization practices at the ethnic group level. Following Bau (2021), I match the practices of 45 ethnic groups to individual data from the 2010 Indonesian Census using the language spoken at home. I then aggregate the data at the regency level. I focus on practices closely related to gender or marriage: location after marriage, emphasis on female chastity, bride price, use of plow agriculture, and polygamy. For more details about the definition of these variables please refer to Appendix Section C.3.

I extract place characteristics from the 1980-2010 Indonesian Decennial Censuses available in IPUMS International (Minnesota Population Center, 2023; Central Bureau of Statistics, 1980, 1990, 2000, 2010) and the 2012, 2013, and 2014 National Socieconomic Surveys (SUSENAS) (Central Bureau of Statistics, 2019, 2020). The Censuses and SUSENAS are very similar to each other but the Census has larger sample sizes. I compute all regency characteristics by restricting the sample to people aged 18 to 64 and aggregating these datasets at the regency level. Whenever possible, I compute these aggregates from the Census.

cases are either too big or too few to be interesting (Bryan and Morten, 2019).

[4] As Appendix Figure B.1 shows, regencies are smaller in the denser islands of Java and Sulawesi.

[5] The IFLS originally sampled households from 13 of the 27 provinces that existed in 1993. These provinces account for 83% of the Indonesian population. I use retrospective work and migration history questions to construct a panel tracking the respondents' location history since birth and their yearly employment history from 1988 to 2014. Additional details on the sample and manipulations of the IFLS data are available in section C.2 in the Appendix.

2.2 Measurement

My main measure of women's labor supply is a dummy equal to one if she was employed during the year.[6] This is the variable I can most consistently track across years and across datasets. However, as a robustness check, I also examine alternative measures such as being a paid worker, total weekly hours worked, and being a full-time worker.

In this analysis, I link women's labor supply choices to the characteristics of their birthplace. This requires having geographic units with boundaries that remain fixed over time. Unfortunately, regency boundaries in Indonesia underwent significant changes from decade to decade between 1980 and 2010, with the creation of new regencies being a common occurrence. For example, just between 2000 and 2010, 154 new regencies were established. To address this issue, I use regency aggregates that had fixed boundaries between 1970 and 2010. These regency aggregates were constructed by IPUMS International and consist of 268 geographic units that are slightly larger than the "original" regencies in the data (Minnesota Population Center, 2023). Additional details are found in section C.4 of the appendix. Moving forward, I will refer to these regency aggregates as regencies.

I proxy for moving distances by calculating the distance between the centroids of the regency of residency and the regency of birth. While there is a risk of overestimating migration distances between neighboring regencies if, for example, most of the moves are happening just around the borders, this method is generally a reliable proxy for moves between regencies that are not contiguous.

For my main analysis, I restrict my sample to one-time internal migrants. These are the people for whom I can distinguish the effect of the current place of residence from the birthplace only for migrants, and for whom I can correctly infer the age of migration. I define migration as living outside the regency of birth. Additionally, whenever I link women's employment to birthplace characteristics, such as FLFP or urbanicity, I source these from the 2010 Indonesian Census.

2.3 Summary statistics

In this section, I provide an overview of my data using the pooled 1985, 1995, and 2005 Intercensal Surveys. Table 1 provides a general description of the entire dataset, as well as statistics disaggregated by gender. This table highlights three critical features of the Indonesian labor market. Firstly, internal migration is common, with approximately one-fifth of Indonesians residing outside their birthplace. These internal migrants are the primary focus of my analysis and, as the table shows, they represent a large cross-section of the Indonesian population. Secondly, the labor market in Indonesia is predominantly informal and agrarian, with 49% of workers being self-employed and working in agriculture. Additionally, there are large gender gaps in employment, worker type, and industry of work. Women are 38 percentage points less likely to work than men, which, while a large gap, is consistent with patterns observed in Southeast Asia. Furthermore, women are five times more likely than men to be unpaid or family workers. Unpaid workers are

[6] This definition classifies unpaid and family workers as employed. The patterns I discuss look similar when I focus on paid workers only.

people that work or help to earn an income but are not paid a wage or salary (Central Bureau of Statistics, 2018). Most unpaid workers work in agriculture (82%) and the retail industry (10%). Lastly, women are more likely than men to work in service and manufacturing industries.

Table 1: Indonesia: summary statistics by gender

	All	**Women**	**Men**
	(1)	(2)	(3)
Migrant	0.21	0.20	0.22
Age	35.54	35.36	35.72
Married	0.71	0.72	0.71
Attended at least high school	0.23	0.20	0.27
Urban	0.37	0.37	0.38
Muslim	0.81	0.81	0.81
Employed	0.66	0.47	0.85
Type of worker			
Self-employed	0.49	0.38	0.56
Salaried	0.34	0.27	0.37
Unpaid / family worker	0.17	0.35	0.07
Industry of employment			
Agriculture	0.49	0.51	0.48
Services	0.36	0.37	0.36
Manufacturing	0.09	0.11	0.08
Construction	0.05	0.01	0.07
Observations	1,317,825	667,691	650,134

Notes: data from the pooled 1985, 1995 and 2005 Intecensal Surveys. Sample restricted to people aged 18 to 64 years old. Migration is defined as residing outside of one's birthplace.

Table 2: Indonesia: women's characteristics by migration status and age of migration

		Migrants	
	Non-migrants	**All**	**Left at 17 or younger**
	(1)	(2)	(3)
Age	35.50	35.43	30.51
Married	0.71	0.75	0.66
Attended at least high school	0.16	0.31	0.25
Urban	0.30	0.65	0.61
Muslim	0.81	0.83	0.85
Children in household	0.71	0.72	0.63
Children ever born[1]	0.92	0.91	0.91
Employed	0.48	0.42	0.40
Type of worker			
Self-employed	0.39	0.34	0.33
Salaried	0.24	0.42	0.40
Unpaid / family worker	0.37	0.24	0.27
Industry of employment			
Agriculture	0.56	0.30	0.35
Services	0.32	0.59	0.52
Manufacturing	0.11	0.11	0.12
Construction	0.01	0.01	0.01
Reason for migrating[2]			
Work		0.14	0.10
Education		0.06	0.07
Other		0.81	0.83
Migration distance (km)		687	447
Observations	518,018	134,031	40,366

Notes: Data from the pooled 1985, 1995 and 2005 Intercensal Surveys. Column (1) shows data from women who have never migrated. Column (2) shows data for women living outside their birthplace, while column (3) does it for those who left their birthplace at 17 or younger. [1]Number of children ever born is available on the 1995 Intercensal Survey only. [2]Uses data from the 1985 Intercensal Survey only. The 1995 and 2005 surveys have data on reason for migrating for only a very restricted set of migration episodes.

In table 2 I zoom in on the female migrants. I present statistics for non-migrants, all migrants, and women who migrated at 17 or younger. The table highlights some large differences between

migrants and non-migrants: female migrants are more educated but less likely to be employed than non-migrants. Moreover, migrants are more likely to hold salaried jobs and live in urban areas. This suggests that they are moving to areas with more formal labor markets and less rural environments. Lastly, column (3) shows that other than the marriage rates, the rate with children, and the level of education, women who left migrated at young ages are generally very similar to the typical female migrant.

In the final rows of table 2, I provide additional details on the characteristics of the move. Women's migration is largely motivated by reasons other than work. Specifically, over 85% of female migrations are associated with either education or "other reasons". Unfortunately, the survey does not provide a breakdown for the latter category. However, data from the IFLS suggests that the great majority of these moves are due to family-related reasons. In addition, the last row summarizes migration distances in kilometers. On average, migrants undertake long-distance moves covering 687 kilometers (426 miles). Even in the case of early migrants who travel shorter distances, their moves still span 438 kilometers (272 miles).

The fact that migrant women are more likely to work in the service sector could suggest that migration in Indonesia is predominantly from rural to urban areas. However, table 3 shows this is not case. There are substantial rural-to-rural and urban-to-urban flows. In this table, I follow Bryan and Morten (2019) and classify regencies into urban or rural according to the share of the regency's population that lives in areas that Statistics Indonesia labels as urban in the Indonesian Census. Urban regencies are those whose urban population is above 43.3%. I chose this cutoff so that the share of people living in regencies I classify as urban matches the aggregate urban share reported by the Indonesian Census. Next, I compute migration statistics for women born in urban and rural regencies. The table shows three salient features. First, migration is not exclusive to rural regencies: 18% of women born in rural regencies migrate, versus the 23% of urban-born women. Second, migration is not just rural-to-urban. Panel A breaks down the migration flows by origin and destination. The urban-to-rural, rural-to-rural and urban-to-urban flows are sizable. Finally, panel B shows that there is considerable heterogeneity in employment rates within each regency classification. Thus, the dispersion in female employment rates I discuss in the next section is not driven only by differences between urban and rural areas.

Table 3: Indonesia: women's migration patterns and regency characteristics by urbanicity of regency of origin

	Birth regency		
	Rural	**Urban**	**Total**
	(1)	(2)	(3)
Number of regencies	168	100	268
Share of women born in these regencies	0.39	0.61	100
Migration rate	0.18	0.23	0.20
A. Share of emigres living in:			
Rural regencies	0.44	0.31	0.38
Urban regencies	0.56	0.69	0.62
B. Characteristics of origin regency			
Women's employment rate			
Average	0.57	0.46	0.53
SD	0.14	0.11	0.14

Notes: I define migration as living outside the regency of birth. Following Bryan and Morten (2019) I classify regencies as urban if the share of population living in an urban area is above a 43.3%. I choose the cutoff to match the urban share at the national level. Data from the Intercensal Survey.

3 Four facts about women's labor supply

In this section, I use data from IPUMS International and the 1980-2010 Indonesian Censuses to present four empirical facts on female labor supply. First, I use data from several countries to show that large geographic differences in women's employment rates within countries are pervasive across the world. Next, I zoom in on Indonesia and (i) characterize the large dispersion in female employment across regencies, (ii) document that it is highly persistent over time, and (iii) show that it is not accounted for by variation in women's demographics or labor market characteristics across regencies. Taken together, these four facts suggest that structural differences could be driving the dispersion in women's labor supply within Indonesia.

3.1 Fact 1: within-country dispersion in women's labor supply is pervasive across countries

In table 4, I provide a snapshot of the within-country variation in men's and women's employment rates for several countries, including Indonesia. These countries are selected from a larger set

with regional employment data available below the province or state level in IPUMS International.[7] For all countries, I restrict the sample to people aged 18 to 64 and compute the employment rates at the smallest geographical unit available. This often corresponds to an administrative unit similar to a county or a municipality. The table orders countries from highest to lowest dispersion in female employment rates, as measured by the interquartile range (IQR) in employment.

This table highlights three insights on women's employment. First, columns (1) to (3) show that, despite the significant differences at the mean, all countries exhibit a large variation in women's employment rates *within* their borders.[8] For most countries, the gap between the localities at the 75th and 25th percentiles shown in column (1) is above 15 percentage points (p.p.). A gap of 15 p.p. is fairly large even for high female employment countries such as Vietnam, Cambodia, and Thailand. Even the smaller IQR of 9 p.p. in the United States is notable, as it is equal to the change in the national US female employment rate during the last *thirty-eight years* (1984-2022).[9]

Second, the dispersion of female employment rates is a widespread phenomenon across countries at different levels of development and different geographic regions. Table 4 includes countries from Asia, the Americas, Africa, and Europe. It also includes middle income countries like Indonesia and Mexico, and high income countries such as USA and Spain. These findings suggest that the factors driving the dispersion in female employment rates are not limited to specific regions or income levels.

Third, columns (4) to (6) reveal that the large within-country dispersion in employment is primarily concentrated among women. With the exception of Brazil, the United States, and Spain, the dispersion in women's employment rates is substantially larger than that of men's. In fact, in ten out of the seventeen countries, the dispersion in women's employment *more than doubles* that of men's. Therefore, while men work at high rates across all regions within these countries, women's rates vary depending on the locality they live in.[10]

[7] Data for the full set of countries is available in table A.1 All the insights discussed in this section generalize to this larger set of countries. Further details about the cross-country data are available in appendix C.1

[8] Appendix table A.2 shows that the large within-country dispersion in women's employment is not the result of regional variation in the rates of unpaid employment. For the specific case of Indonesia, 55% (IQR 12 p.p.) of the total dispersion still remains when I focus on paid employment only. This –reduced– IQR of 12 p.p. is still more than twice that of men's.

[9] This benchmark is not affected by the Covid-19 drop in women's employment. By 2022, women's employment had recovered to pre-Covid levels.

[10] While the district employment rates are measured with error, I find unlikely that this is the primary driver of the dispersion of female employment. The variation in women's employment is much larger than that of men's across most countries. Even if measurement error were greater for women than for men, this difference would have to be substantial to account for the gender differences shown in table 4.

Table 4: Dispersion in regional employment rates for selected countries

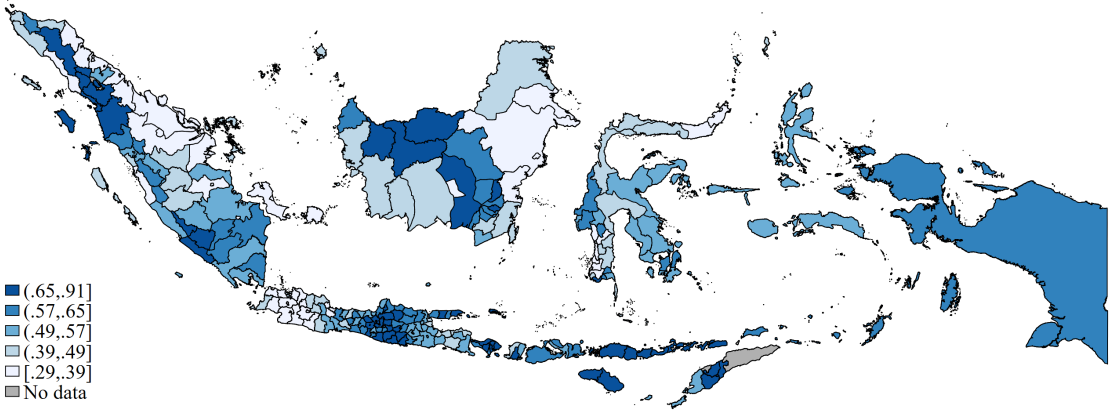
	Women			Men			Average unit population	N. geographic units
	IQR	SD	Mean	IQR	SD	Mean		
Country	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
China	0.28	0.17	0.71	0.14	0.10	0.85	266,748	2,845
Indonesia	0.22	0.14	0.53	0.05	0.04	0.87	533,867	268
Myanmar	0.21	0.13	0.51	0.07	0.05	0.86	83,531	362
Panama	0.20	0.12	0.33	0.04	0.08	0.80	56,049	35
Vietnam	0.19	0.12	0.82	0.06	0.06	0.90	79,146	674
Brazil	0.19	0.11	0.48	0.19	0.11	0.73	59,010	2,040
Mexico	0.17	0.11	0.30	0.09	0.08	0.80	27,853	2,330
Cambodia	0.16	0.11	0.84	0.08	0.05	0.90	50,186	174
Thailand	0.16	0.11	0.81	0.08	0.06	0.88	58,290	670
South Africa	0.16	0.11	0.30	0.06	0.06	0.53	138,127	224
Argentina	0.15	0.10	0.53	0.08	0.06	0.83	75,022	312
Philippines	0.13	0.10	0.30	0.08	0.06	0.82	40,423	1,274
Chile	0.12	0.08	0.51	0.05	0.04	0.79	57,826	192
Bolivia	0.12	0.06	0.58	0.05	0.03	0.86	70,323	80
Spain	0.11	0.08	0.51	0.09	0.06	0.61	105,902	286
Malaysia	0.11	0.07	0.38	0.06	0.04	0.84	91,509	133
USA	0.09	0.07	0.67	0.10	0.07	0.77	202,635	722

Notes: SD and IQR stand for Standard Deviation and Interquartile Range. The table shows statistics from a cross-section of countries in IPUMS International with data available at a small geographic level. For all countries I use census sample from 2010 or the closest available year. Rows are ordered from highest to lowest dispersion in women's labor supply. I aggregate data at the smallest geographical unit available, except for the USA where I use Commuting Zones as in Autor and Dorn (2013). Column (7) shows the total population for the average geographic unit in each country. These are unweighted cross-locality means which –might– differ from the national-level means. See table A.1 and section C.1 in the appendix for additional details on the cross-country data.

3.2 Fact 2: there is large within-country dispersion in women's employment rates in Indonesia

Figure 2 provides a detailed view of the variation in female employment rates within Indonesia. The map shows women's employment rates in all 268 regencies in my dataset, grouped by color into quintiles. Darker blues indicate higher employment rates. The map reveals that women work at vastly different rates across the country. For instance, the top quintile of regencies has employment rates above 65%. In contrast, the bottom quintile of regencies has rates below 29%. This last group includes significant population centers such as the Bogor regency and the city of Medan.[11] More importantly, the map reveals that the dispersion in women's employment extends across the whole country and is not driven by any particular province, island, or group of regencies.

Figure 2: Indonesia: women's employment rate by regency, 2010



Notes: The figure shows regency-level employment rates for women aged 18-64. It shows all the 268 regencies with consistent boundaries between 1970 and 2010. Each color groups a fifth of the regencies. The figure uses data from the 2010 Indonesian census from IPUMS international.

3.3 Fact 3: women's employment rates are highly persistent

The large dispersion in women's employment rates could be the result of (i) temporary economic shocks that depress women's employment in some parts of Indonesia, (ii) measurement error in the employment rates, or (iii) structural differences across regencies that are correlated with female employment. To understand the primary cause of the variation in employment rates, we can examine the persistence of these rates across years. If the dispersion arises mainly due to temporary shocks or measurement error, we should expect very low persistence in the regencies' employment rates across years. This is because temporary shocks should dissipate after several years, and I expect measurement error to be independent across decades. In contrast, high cross-year persistence indicates that the variation in women's employment likely reflects structural differences across regencies.

[11] Medan, the capital and largest city in the province of North Sumatra, is the third most populous city in Indonesia as of 2020 (Brinkhoff, 2022) Bogor, with over five million people, borders the Jakarta metropolitan area. Refer to their locations in appendix figure B.1.

Table 5: Indonesia: autocorrelation in regency-level women's employment rate, 1980-2010

Regressor	(1)	(2)	(3)	(4)
Female employment 10 years ago	0.80			
	(0.02)			
Female employment 20 years ago		0.72		
		(0.03)		
Female employment 30 years ago			0.70	
			(0.04)	
Same-year male employment				0.51
				(0.04)
Observations	800	534	268	1,071

Notes: The table shows the autocorrelation of regency-level employment rates across different time horizons. It also shows the simultaneous correlation between the employment of both genders. Data from 1980-2010 Indonesian Census taken from IPUMS international. Robust standard errors are in parenthesis.

In columns (1) to (3) of table 5, I show estimates of the autocorrelation of the regency-level employment rates across different time horizons. For this table, I standardized the regency employment rates separately by year and run regressions of the form:

$$e_{rt} = \gamma_{t-j} e_{rt-j} + \varepsilon_{rt} \tag{1}$$

where e_{rt} is the standardized employment rate in regency r at time t.

The autocorrelation estimates suggest that the variation in women's employment rates is primarily driven by structural differences across regencies, and not by temporary shocks or measurement error. The autocorrelations are considerably high, starting at 80% for the ten-year horizon and staying as high as 70% for the thirty-year horizon. As a benchmark, I report the estimate of the simultaneous correlation with men's employment rates in column (4). Notably, women's employment rates are more correlated with themselves 30 years apart than with men's employment rates in the same year.[12]

[12]The large persistence of female employment rates is not exclusive to Indonesia. Appendix figure B.2 shows that large 10-year auto-correlations also arise in other countries. For most countries, this auto-correlation is over 67%.

3.4 Fact 4: dispersion in women's employment rates cannot be accounted by differences in women's characteristics alone

The highly persistent variation in female employment is likely driven by structural differences across regencies. These could be, for example, differences in the family structure or the industry mix of employment across these labor markets. Motherhood is associated with lower female attachment to the labor market (Angelov et al., 2016; Kleven et al., 2019). Moreover, differences in the industry mix account for up to 80% of the variation in women's labor supply in developed countries (Olivetti and Petrongolo, 2016). Therefore, it is possible that the observed dispersion in female employment rates reflects underlying differences in family structure and industry mix across regencies.

In table 6, I test whether permanent differences in the industry mix or women's demographics could account for most of the dispersion in female employment across regencies. This table shows the R^2 from regressions of employment rates on a series of regency-level controls. They include the share of people married, the share with small children, along with measures of the age structure, the education level by gender, and the industry mix of employment. I run the regressions separately by gender and stack data from all the 1980-2010 censuses. Additionally, I include year fixed effects to absorb national time trends in employment. If these factors accounted for most of the variation in female employment, we should expect very high R^2 values for these regressions.

Table 6: Indonesia: share of employment rate dispersion accounted for observed regency characteristics, 1980-2010

	Women					**Men**				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
R^2	0.13	0.26	0.30	0.31	0.47	0.01	0.41	0.60	0.69	0.79
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Age structure		✓	✓	✓	✓		✓	✓	✓	✓
Women's education			✓	✓	✓					
Men's education								✓	✓	✓
Share married				✓	✓				✓	✓
With child under 5				✓	✓				✓	✓
Industry shares					✓					✓
N	804	804	804	804	804	804	804	804	804	804

Notes: The table reports the R^2 of a regression of regency employment rates on regency-level aggregates. Age structure controls are the shares of people aged 30-49 and 50-64. Education measures are the shares of people who attended at most middle school, high school, and college. When indicated, the regressions include 1-digit industry shares. Data from the 1980, 1990, 2000, and 2010 Indonesian Census samples from IPUMS International.

Table 6 reveals that differences in women's demographics or the industry mix account for only a

moderate share of the dispersion in female employment across regencies. In column (4), controlling for women's education level and the regency's family and age structure accounts for only a third of the dispersion in employment rates. Adding a complete set of 1-digit industry shares takes the R^2 to 47%. Although these factors account for a portion of the employment rate dispersion, collectively, they still leave 53% unaccounted for. In contrast, column (10) shows these same variables can account for 80% of the variation in men's employment rates. Therefore, the dispersion in female employment rates reflects variation in *other* factors that are *specific* to women. This means that the variation in female employment is likely driven by structural differences across regencies that are not captured by the variables included in these regressions. These could be differences in the social norms, cultural values, or institutional arrangements that shape gender roles and expectations in different contexts.

4 Empirical strategy and results

I start this section by showing that, conditional on the current place of residence, birthplace is highly predictive of women's labor supply in adulthood even for those who migrated at 17 or younger. This persistence can reflect the causal effect of birthplace or a spurious correlation driven by women's unobserved characteristics. I then use data of age at migration to separate these two sources of variation, and show evidence that the longer female migrants stay in their birthplace, the stronger the predictive power of birthplace. I interpret this as evidence that longer stay in birthplace has a causal effect on women's labor supply decisions.

4.1 Birthplace is highly predictive of women's labor supply

I start by comparing the labor supply of women who *live in the same location* but were born in different regencies using an specification inspired by the epidemiological approach from Fernandez and Fogli (2009). I regress a dummy equal to one if the person is employed at year t (e_{it}) on year by current-regency fixed-effects ($\omega_{c(i)t}$),[13] FLFP rate in the regency of birth ($p_{b(i)}$), and a set of individual and regency-level controls X_{it}. These controls might include age, religion, education, etc.

$$e_{it} = \omega_{c(i)t} + \boldsymbol{b}p_{b(i)} + X_{it}\kappa + \varepsilon_{it} \tag{2}$$

The rationale for including the birthplace FLFP rate as a regressor, is that it captures all the factors that help determining the aggregate labor supply in the regency (Fernandez and Fogli, 2009). I compute these rates using the sample of all women aged 18 to 64 living in regency b in the census of 2010.[14] I obtain similar results when using data from previous census years.

[13] The $c(i)$ notation emphasizes that this refers to the current place of residence of individual i.

[14] The results are robust to changes in the age range used to compute FLFP rates. The participation rates of women aged 18-64 are almost perfectly correlated with those of women aged 18-50.

The parameter of interest in this regression is denoted by $\boldsymbol{b}$, which measures the relationship between women's labor supply and the prevailing FLFP in their birthplace. I will refer to $\boldsymbol{b}$ as the birthplace persistence coefficient. Because the model includes regency-by-year fixed effects, $\boldsymbol{b}$ is primarily identified out of differences in labor supply between women who live in the same regency, in the same year, but who were born in different localities. This approach controls for permanent differences between the places of current residency, such as variations in average wages, industry mix, healthcare availability, and other factors, which are absorbed by the parameter $\omega_{c(i)t}$.

A positive value of $\boldsymbol{b}$ may not necessarily indicate a causal relationship between birthplace FLFP rates and women's labor supply. Instead, it could capture differences in factors that are unrelated to birthplace characteristics, such as unobserved individual traits or preferences that make women from high-FLFP locations more likely to work than their counterparts from low-FLFP areas. For example, parents from high-FLFP areas could have invested more in their daughter's career.

Table 7: Indonesia: estimates birthplace persistence on female labor supply

	Women			**Men**		
	(1)	(2)	(3)	(4)	(5)	(6)
Female LFP rate at birthplace ($p_{b(i)}$)	0.33***	0.32***	0.33***	0.10***	0.08**	0.08***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)
Mean employment rate	0.423	0.423	0.423	0.862	0.862	0.862
Implied IQR gap	0.073	0.072	0.074	0.022	0.019	0.017
Regency-year FE	✓	✓	✓	✓	✓	✓
Age		✓	✓		✓	✓
Education			✓			✓
Observations	110,872	110,872	110,872	115,772	115,772	115,772
R^2	0.07	0.07	0.09	0.06	0.22	0.23

Notes: This table uses data from the pooled 1985, 1995 and 2005 Intercensal Surveys and restricts the sample to people who reside outside their birthplace. The implied IQR gap shows the implied employment gap between someone born at a regency at the 75th percentile of FLFP and someone born at the 25th percentile. The IQR of FLFP rates across regencies is 22 percentage points. Standard errors are clustered by regency of birth. When applicable, regressions control for a quadratic polynomial in age and fixed effects for four education categories.

Table 7 shows estimates of the birthplace persistence coefficient $\boldsymbol{b}$. Column (1) shows results from a baseline specification that includes regency-by-year fixed effects only. The coefficient of 0.33 indicates that birthplace is highly predictive of women's employment. To make the magnitude more concrete, let us consider two women: Putri and Amanda. They both live in Jakarta, but Putri was born in the city of Probolinggo in East Java, which has a female employment rate of 40%. In contrast, Amanda was born in the regency of Sukoharjo in Central Java, which has a female employment rate of 62%. These rates place these regencies at approximately the 25th and the 75th percentiles of the distribution of FLFP. The 0.33 coefficient implies that Putri is 7.3 percentage points less likely to work than Amanda. This is a difference of 17% relative to the employment rate

of the average woman in my data.

The additional estimates in table 7 also allow me to rule out several potential drivers of the birthplace persistence. Columns (2) and (3) show that controlling for women's age and education barely modifies the estimate. Thus, this persistence is not explained by geographic differences in these factors. Recent research suggests that exposure to low-FLFP places can affect women's labor supply through the expectations and education channel (Molina and Usui, 2022). In areas with low FLFP rates, women set low labor market expectations and thus invest less in education. However, column (3) indicates that the birthplace persistence is not driven by differences in educational investment.

Table 7 also shows that the strong birthplace persistence in labor supply is essentially exclusive to women. In columns (4) to (6) I display estimates from regressions where I relate men's employment in adulthood to their birthplace's *FLFP* rate. Note that all these estimates are below 0.10 (about 30% the estimates in women) and imply little variation in men's employment rates across regencies. For example, the estimate in column (6) implies an IQR gap of only 1.7 p.p.

The persistence in women's employment choices could still be driven by variation across regencies in, for example socioeconomic or demographic factors. Unfortunately, the Intercensal Survey has limited demographic and socioeconomic information. Therefore, in Table 8 I take advantage of the rich data available in the IFLS to rule out additional potential drivers of the birthplace persistence.[15]

First, in columns (1) to (3) of table 8 I reproduce the birthplace persistence estimates for the female migrants in the IFLS using the same specifications as in table 7. Reassuringly, these results confirm the Intercensal survey estimates, with a similarly large implied IQR of 8 p.p.[16]

[15] See appendix section C.2 for further details about the IFLS data

[16] Moreover, Table A.4 in the appendix shows very small persistence estimates in the male sample.

Table 8: Indonesia: estimates birthplace persistence on women's labor supply

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female LFP rate at birthplace ($p_{b(i)}$)	0.38***	0.39***	0.35***	0.37***	0.34***	0.34***	0.29***	0.24**
	(0.04)	(0.04)	(0.05)	(0.04)	(0.04)	(0.04)	(0.08)	(0.08)
Mother's work history								0.08**
								(0.03)
Mean employment rate	0.54	0.54	0.54	0.54	0.54	0.54	0.51	0.51
Implied IQR gap	0.08	0.09	0.08	0.08	0.08	0.08	0.06	0.05
Sample	Full	Full	Full	Full	Full	Full	Known mother	Known mother
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Regency FE	✓	✓	✓	✓	✓	✓	✓	✓
Age		✓	✓	✓	✓	✓	✓	✓
Religion			✓	✓	✓	✓	✓	✓
Education				✓	✓	✓	✓	✓
Childhood SES					✓	✓		
Siblings						✓		
Mother worked								✓
Observations	64,501	64,501	64,501	64,501	64,501	64,501	18,135	18,135
N individuals	6,115	6,115	6,115	6,115	6,115	6,115	2,640	2,640
R^2	0.10	0.12	0.13	0.14	0.14	0.14	0.14	0.14

Notes: Uses data from the IFLS. Sample restricted to people residing outside their birthplace. The implied IQR gap shows the implied employment gap between someone born at a regency at the 75th percentile of FLFP and someone born at the 25th percentile. The IQR of the FLFP rates across regencies is of 22 percentage points. Standard errors clustered by regency of birth. When indicated, the regressions control for a quadratic polynomial in age, and fixed effects for seven religion and four education categories. Mother's work history measured as the share of years I observe the mother working.

Moreover, columns (5) to (8) of table 8 rule out childhood socioeconomic status and maternal labor supply as main drivers of these results. In columns (5) and (6), I study the role of childhood socioeconomic conditions. These variables come from a battery of questions where respondents reported information on their household when they were 12 years old. These include wealth and education proxies such as the number of books, the number of people per room, and whether their father was in formal employment, among others. Remarkably, adding these additional controls has little effect on the childhood persistence estimate. In addition, in columns (7) and (8), I rule out the possibility that the birthplace persistence is driven by differences in maternal labor supply across regencies. Previous literature shows that connection to working mothers has an effect on women's labor supply (Fernández et al., 2004; Morrill and Morrill, 2013; Olivetti et al., 2020). Therefore, the birthplace persistence might just be reflecting the fact that in places where more women work, there are higher shares of working mothers. Because of the panel nature of the IFLS, I can identify the maternal labor supply for a subset of women in my sample. For each female migrant in this subset, I compute the share of years their mother reported having worked and included this as a control in the regression. Column (7) re-estimates the birthplace persistence for this smaller sample, while column (8) shows the persistence estimate when I control for the mother's work history. In line with the literature, the presence of a working mother is positively associated with the daughter's labor supply. For the average woman in the sample, the coefficient in column (8) implies a 4.7 percentage point higher probability of working when the mother worked. Nevertheless, the birthplace persistence is not explained away by maternal labor supply. Although the persistence estimate in column (8) is slightly smaller, it is still large and of the same order of magnitude.

4.2 There is large persistence even for those who migrated young

The birthplace persistence could be reflecting complex endogenous relationships between women's origin, their migration decision and their labor supply. Migration is a voluntary decision where the potential job opportunities at the destination are likely influence where women move to. In table 9, I focus my analysis on women who left their birthplace at 17 or younger. Thirty eight percent of female migrants left their birthplace before this age. For these women, the migration decision is more plausibly driven by their parents' decisions.[17] Reassuringly, I obtain similar persistence estimates for these sample.[18] Moreover, these estimates are robust choosing an alternative age cutoff (see appendix figure B.3).

[17] I cut at 17 years old because there is a large uptick in the number of people migrating at 18, which suggests that at this age migrants are likely to move by their own accord.

[18] Appendix table A.5 shows that the men migrating at 17 or younger display birthplace persistence estimates similar to those of women. However, as we will see in the next section, they are mostly driven by unobserved differences between men of different origins.

Table 9: Indonesia: estimates birthplace persistence on labor supply for women who migrated young

	(1)	(2)	(3)
Women's employment rate at birthplace (p_b)	0.33***	0.33***	0.34***
	(0.03)	(0.03)	(0.03)
Mean employment rate	0.42	0.42	0.42
Implied IQR gap	0.07	0.07	0.08
Regency-year FE	✓	✓	✓
Age		✓	✓
Education			✓
Observations	36,738	36,738	36,738
R^2	0.08	0.08	0.09

Notes: This table uses data from the pooled 1985, 1995, and 2005 Intercensal Surveys and restricts the sample to women migrated at 17 or younger. The implied IQR gap shows the implied employment gap between someone born at a regency at the 75th percentile of FLFP and someone born at the 25th percentile. The IQR of FLFP across regencies is 22 percentage points. Standard errors are clustered by regency of birth. When applicable, regressions control for a quadratic polynomial in age and fixed effects for four education categories.

4.3 The birthplace persistence is stronger the longer you stay

The strong birthplace persistence in women's labor supply could still reflect unobservable differences between women born at different regencies. In this section, I address this concern by exploiting differences in the timing of migration to argue that this persistence reflects the causal effect of women's birthplace. I first illustrate how I use data on age of migration to identify the birthplace effects and the identification assumptions I need. Next, I show that the birthplace persistence is indeed stronger the longer women stay in their origin labor market, and that this stronger persistence is driven by access to *paid employment*. The section concludes by showing evidence that support my identification assumptions.

4.3.1 Exploiting data on length of stay

I exploit data on length of stay and augment expression (2) by (i) allowing the coefficient on FLFP to vary by migration age ($\boldsymbol{b_a}$), and (ii) allowing the regency fixed effects to vary by year and age of migration ($\omega_{c(i)at}$):

$$e_{it} = \omega_{c(i)at} + \boldsymbol{b}_a p_{b(i)} + X_{it}\kappa + \varepsilon_{it} \tag{3}$$

This specification augments Fernandez and Fogli (2009)'s approach by using a strategy inspired

by Chetty and Hendren (2018a). The age-specific persistence coefficients b_a are identified from variation within regency-year-age cells. In other words, they stem from comparing the labor supply choices of women who have been in the same destination regency but who were initially exposed to different FLFP rates for different lengths of time. Therefore, differences in the b_a across ages are driven *only* by differences in the length of exposure to the origin FLFP.[19]

In specification (3), I focus on the effect of the origin labor market. Two reasons support this choice. Firstly, persistent effects from the origin location even after the exposure has ceased are interesting in their own right. Secondly, by considering the origin rather than the destination, I can more effectively argue that any observed effects stem from women's labor supply choices rather than differences in labor demand structures across locations.

As I discuss in appendix section D, I can decompose the OLS estimates of age specific-slopes into a cumulative causal effect up age a ($\boldsymbol{\sigma}_a$), and a selection term $\boldsymbol{\gamma}$:

$$\boldsymbol{b}_a \quad = \quad \boldsymbol{\sigma}_a + \boldsymbol{\gamma}$$

the selection term γ reflects omitted variable bias. This parameter captures the fact that women from the same origin are likely to share characteristics that make them more (or less) likely to work, but which are not driven by a place effect. For example, parents in areas with high female employment might be richer and more likely to invest in their daughters education. Under the key assumption that this omitted variable bias is constant across migration age cohorts (i.e. γ is age-independent), I can identify the causal effect of place at any given age (π_a) by subtracting the persistence coefficients across migration ages:[20]

$$\boldsymbol{\pi}_a \quad = \quad \boldsymbol{b}_{a+1} - \boldsymbol{b}_a$$

Moreover, the coefficient for the least exposed cohort gives an estimate of the omitted variable bias: $\boldsymbol{\gamma} = \boldsymbol{b}_0$.

To estimate this model, I leverage data about the age of migration from the Intercensal Survey. However, adding current-regency fixed effects that vary by survey year and by migration age imposes considerable data requirements. To identify the birthplace coefficients, the regency-year-age cells should be big enough to contain women from different birthplace regencies. However, because the number of people migrating at any given age is small relative to the number of regencies, I am forced to bin migration ages into multi-age cells: (i) 0 to 3, (ii) 4 to 8, (iii) 12 to 14 years old, and one-year cells thereafter. Appendix table A.3 shows that this grouping creates cells of reasonable sizes.

[19] Note that the regency fixed effects also vary by survey year to allow flexibility on the effect of the current labor market. My dataset includes data from 1985 to 2005, and Indonesia experienced important structural changes during this time. For example, there was a 15% decline in the share agricultural employment, which went from 52% in 1991 to 44% in 2005 (World Bank, 2024).

[20] Chetty and Hendren (2018a) identify the place effects by exploiting variation in the age of migration across siblings within the same family. I cannot apply this strategy with my data because neither the Intercensal Survey nor IFLS does not contain sibling information.

Adding regency-age-year fixed effects places considerable demands on the data. Therefore, when sample size becomes a concern, I also adopt a less demanding specification that uses regency-by-year ($\omega_{c(i)t}$), and year-by-migration age fixed effects (λ_{at}):

$$e_{it} = \omega_{c(i)t} + \lambda_{at} + \boldsymbol{b}_a p_{b(i)} + \boldsymbol{d}_a p_{c(i)} + X_{it}\kappa + \varepsilon_{it} \quad (4)$$

where I included the FLFP at the current regency ($p_{c(i)}$) to capture the effect of longer exposure to the current location. While this specification offers the advantage of being less demanding relative (3), it comes with the limitation of being much less flexible in terms of how the destination regency affects women's choices. Note that the model in (4) roughly identifies the age-specific persistence coefficients b_a by comparing women living in the same regency adulthood, but who migrated from regencies with different FLFP at different ages. In practice, however, the results under (3) and (4) are quite similar.

4.3.2 Longer stay does make you more likely to work

Figure 3 displays estimates of birthplace persistence ($\boldsymbol{b_a}$) by age of migration for both men and women. My sample remains restricted to people who left their birthplace at 17 or younger. The regressions control for a quadratic polynomial in age, as well as regency-year-age, and education-level fixed effects. The coefficients were rescaled to allow direct interpretation as the implied gap between women born in regencies at 75th percentile versus the 25th percentile of FLFP.

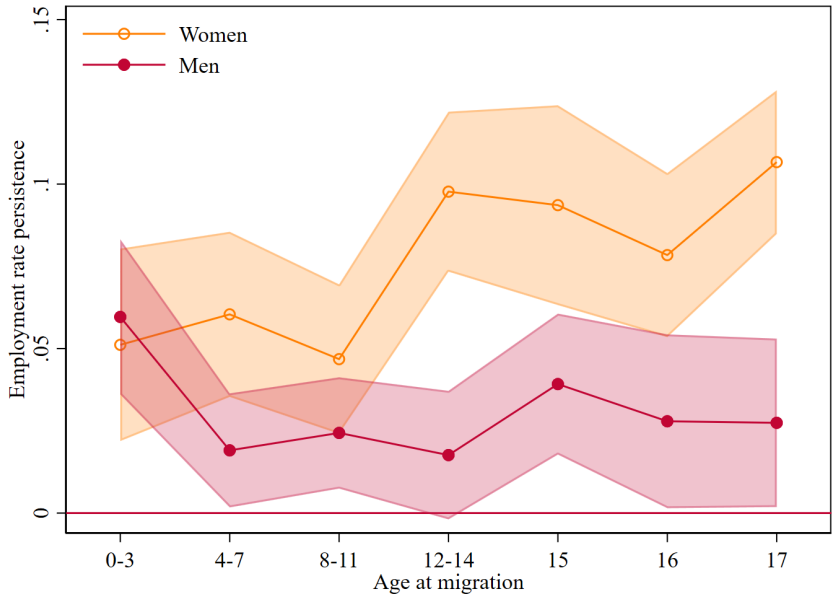
Figure 3 shows a striking pattern in the birthplace coefficients: women with longer exposure to high-employment locations are more likely to work. Women's slopes increase from 5.1 p.p. for the least exposed women (those leaving at the age of four or younger), to 10.7 p.p. for the those with the most exposure. Women leaving a high-FLFP regency before the age of four have minimal exposure to their birthplace, and yet these results imply that they are more likely to work than women who left low-FLFP regencies at that same age. Following the discussion in section 4.1, I interpret the 5.1 p.p. slope as reflecting unobservable differences that make women from high-FLFP more likely to work from the outset. In contrast, I interpret the 5.6 p.p. increase in the slopes as stemming from the effect of longer exposure to high-FLFP regencies.

These results suggest that place effects play a crucial role in driving geographic differences in women's labor supply. The 5.6 p.p. increase is fairly large when compared to multiple benchmarks: it is approximately one fourth of the gap in FLFP between the 75th and 25th regencies, and it is 14% of overall employment rate for migrant women in the sample (40%).[21]

Figure 3 also suggests that birthplace effects take effect before late adolescence. The slopes after 14 years old are roughly constant. This suggests that additional exposure during late in adolescence has little effect over women's labor supply choices later in life. Although figure 3 shows a sharp increase at 12-14 years old, I want to emphasize that these slopes are noisy and it is possible that

[21] The employment rate for the women in the early migrant sample has changed remarkably little since 1985. It was 36% in 1985, 40% in 1995 and 42% in 2005.

Figure 3: Indonesia: length of stay and likelihood of employment



Notes: The figure shows estimates of the birthplace persistence coefficients by age of migration $\boldsymbol{b_a}$. The coefficients are rescaled so that they can be interpreted as the implied gap between women from 75th and 25th percentile regencies. The regression controls for regency-by-year-by-migration age fixed-effects, a quadratic polynomial on age, and education level fixed-effects. Standard errors are clustered by regency of birth. The figure shows 90% confidence intervals. It uses data from 1985, 1995 and 2005 Intercensal surveys.

the birthplace effects cab be more gradual than what figure 3 suggests.[22] In fact, in appendix figure B.5 I estimate specification (4) which allows me to disaggregate more the age bins. Although the point estimates are very similar, the estimates at early ages are more unstable with slight increases at 3-5 and after 6 years old, which could be consistent with a more gradual effect from longer exposure to the origin labor market.

In addition, figure 3 presents birthplace persistence estimates for men. Similar to women, men from high-FLFP locations possess traits that make them more likely to work. However, all the slopes from age 4 onwards are smaller than those for ages 0-3. Although a decline in the slopes suggests that very early exposure to these locations makes men less likely to work, the patterns for men are much less clear. Overall, there is a decline of 3.3 p.p. between the first and last slope. If were to take this decline seriously and combine it with women's results, they imply a decline of 8.9 p.p. in the gender gap in employment because of longer exposure to high-FLFP regencies.

The clear contrast across genders in the birthplace coefficients also arises when using alternative datasets. In appendix figure B.6 I show the results of estimating a variation of equation 4 that replaces the regency-year fixed effects with regency and year fixed effects using data from the IFLS. The figure reproduces closely the increasing persistence for women, coupled with little overall

[22] I can reject the hypothesis that all slopes are the same at the 1% significance level. Moreover, the 12-14 slope is significantly greater than the 0-3 slope at the 1% level.

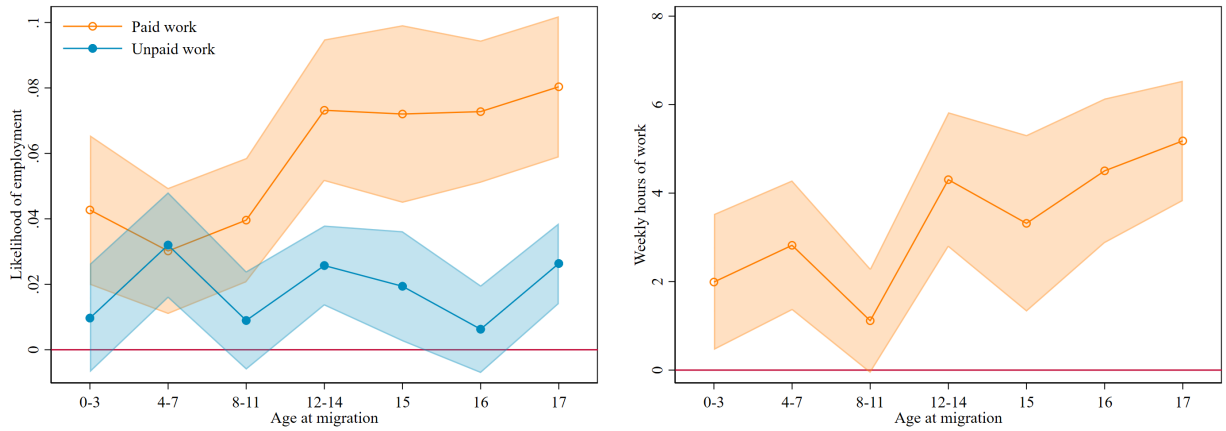
movement for men. Although qualitatively similar, the IFLS estimates imply an increase of 9.4 p.p. in the IQR stemming from longer exposure to high-FLFP locations, this is about twice the size of my main Intercensal Survey estimates. Moreover, the persistence tapers off later: at 15-16 rather than 12-14.

4.3.3 Longer stay translates into similar patters for other outcomes

In figure 4 I show that longer exposure to high-FLFP labor markets also translates into higher paid employment and higher working hours. Panel (a) breaks down the employment into paid and unpaid work. Unpaid work accounts for about a 35% of all female employment. The increase in employment from figure 3 is unlikely to represent more economic independence for women if it were entirely driven by unpaid work. However, panel (a) shows that increase in the birthplace persistence is driven by *paid employment*. The rise in the coefficients between 0 to 17 years old translates into an increase of 3.8 p.p. in the likelihood of paid employment for women exposed longer to high-FLFP regencies. This is 68% of the effect on any employment from figure 3. This contrasts with results on unpaid work where there is little evidence of a clear and meaningful effect.

Figure 4: Results on alternative labor market outcomes

(a) **Type of employment** (b) **Weekly hours and full time employment**



Notes: The figure shows estimates of the birthplace persistence coefficients by age of emigration $\boldsymbol{b_a}$. The coefficients are rescaled so that they can be interpreted as the implied gap between women from 75th and 25th percentile regencies. Uses data from the 1985, 1995 and 2005 Intercensal Surveys. The figure shows 90% confidence intervals.

Panel (b) of figure 4 shows additional results on weekly hours of work. Data on weekly hours of work is not available in the 2005 Intercensal Survey, thus, these results use data from the 1985 and 1995 surveys only. Although the estimates are noisier, the plot shows a picture in line with the previous results: staying in high female employment places raises women's labor supply. The overall increase in the slopes up to 17 years old translate into an increase of 3 weekly hours of work for women exposed longer to high-FLFP regencies. This an increase of 33% in work hours relative to the mean of 15 hours for the sample.

So far, all the evidence presents a consistent picture: longer stay in high-FLFP labor markets translates into higher attachment to the labor market in adulthood. Women with more exposure to these labor markets are more likely to be paid workers, and work longer hours. A natural question is whether they also have higher earnings. I explore this question in figure B.8 in the appendix where I show birthplace persistence coefficients in regressions with total earnings and hourly wages as dependent variables. These regressions restrict the sample to the much smaller group of migrant women with non-zero earnings. Moreover, earnings information is only available in the 1995 survey, which further reduces the sample. Because this is a much smaller sample, I am forced to use wider bins for the emigration age. These results are noisy, but they give some suggestion that longer exposure to high female employment locations could lead to higher wages for women.

Finally, in figure 5 I present results for marriage and fertility outcomes. Marriage and fertility decisions are often intertwined with local norms and women's labor supply decisions (Fernandez and Fogli, 2009; Jayachandran, 2021). For all the panels, birthplace FLFP remains as the main regressor. Panel (a) shows results for the number of children in the household, panel (b) shows the probability of ever being married, while panel (c) shows the age of first marriage (for those already married). All waves from the Intercensal Survey include data on the number of children present in the household and marital status, but information about age at first marriage is only available for the 1995 and 2005 surveys. Consequently, the estimates in panel (c) are based on a smaller sample and are noisier. Nevertheless, both panels present a picture consistent with small but significant reductions in fertility and delays in marriage. The decline in the slopes from ages 0 to 15 in panel (a) for the number of children of all ages implies a reduction in fertility of 0.14 children (8.7% relative to a mean of 1.59 children) for those born in a 75th percentile location relative to those at the 25th percentile. Appendix figure B.7 shows that there are no such effects on for men. Similarly, panels (b) and (c), albeit noisily, show patterns consistent with small delays in marriage. The change in the slopes from ages 4 to 16 in panel (b) implies a reduction of 3 p.p. in the probability of marrying (4% relative to a mean of 73%), while the change in panel (c) implies a delay of the first marriage by 5 months (2.8% relative to a mean age of marriage of 18).[23]

4.3.4 The data supports the constant selection assumption

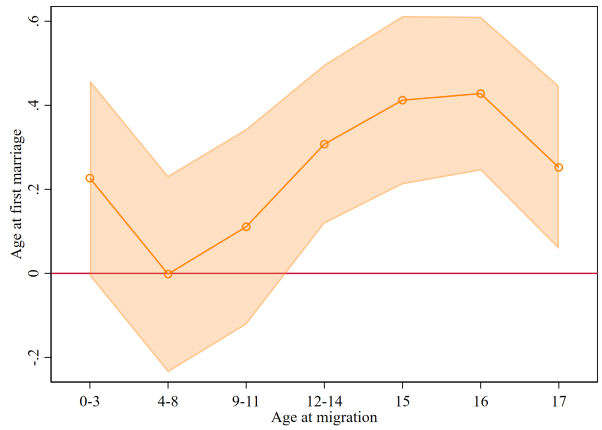
The causal interpretation of the birthplace persistence coefficients hinges on the assumption that selection is independent of the age of migration. More precisely, conditioning on the current location and other controls, I require the relationship between unobserved characteristics of women and the birthplace FLFP to be the constant across different ages of migration. Below, I present results showing that selection along various observable dimensions is fairly constant across emigration age, suggesting the likely validity of this identification assumption in my dataset.

Consider the identification assumption as analogous to parallel trends in Difference-in-Differences. While I anticipate that there are unobservable differences between women from high and low FLFP

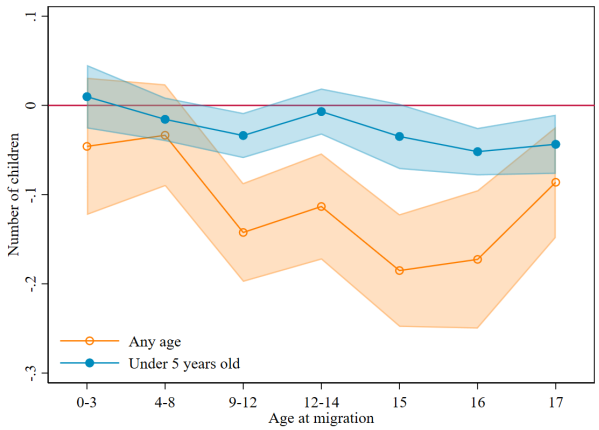
[23]Note that the average woman in my sample is 31 years old. The apparent decline in the probability of marriage in panel (b) likely indicates a postponement rather than a rejection of marriage.

Figure 5: Indonesia: length of stay and marriage and fertility

(a) Age at first marriage



(b) Number of children



Note: The figure shows estimates of the birthplace persistence coefficients by age of emigration $\boldsymbol{b_a}$. It uses data data from 1995 and 2005 Intercensal surveys. Panel (b) uses information from the 1995 survey only, as fertility data is not available for 2005. The regression controls for current regency by year fixed-effects, a quadratic polynomial on age, and education level fixed-effects. The figure shows 90% confidence intervals Figure generated on 2 Aug 2024 at 14:53:54.

regions, this does not pose an issue for my approach. However, if factors correlated with female employment change differently across migration ages for these two groups, I might incorrectly attribute this variation to the causal effect. Thus, the absence of parallel trends could lead to finding a causal effect where none exists.

I cannot test the constant selection assumption. However, I can test whether the correlation between the birthplace FLFP and several observable characteristics is the same no matter the age women migrated. To do this, I use a slight modification of my main specification in (3) and regress women's characteristics y_i on regency-year-age fixed effects (when possible), FLFP at birthplace $p_{b(i)}$, and interactions between age of migration and birthplace FLFP:[24]

$$y_i = \omega_{c(i)at} + \beta p_{b(i)} + \sum_{a=3}^{a=18} \beta_a 1_a \times p_{b(i)} + X_i\kappa + \varepsilon_{it} \tag{5}$$

as in previous sections, I normalized the FLFP rates so that the slopes can be interpreted as the IQR gap.

In model 5, I set 0 to 4 as the base category. This means that the β_a slopes represent the difference between the slope at age a relative to the slope at age 0-4. This specification facilitates visual comparison across different outcomes, as all estimates are centered around zero when the constant selection assumption holds. Under constant selection across all the ages, *all the interaction terms β_a should be jointly zero.*[25]

[24] When regency-year-age fixed effects cannot be included because, for example, the outcome is a destination regency characteristic, I add year and age of migration fixed effects.

[25] Even if all the slopes are not jointly zero, identification is sill possible within the subset of ages where constant

In figure 6, I present estimates of the β_a interactions for three sets of outcomes: characteristics of the destination in panels (a) and (b), reasons for migrating in panel (c), and socioeconomic characteristics in panel (d).

In panel (a) of figure 6 the FLFP in the destination regency is the outcome variable. If parents from high-FLFP regions were increasingly selecting locations where more women work, the correlation between birthplace and destination FLFP should increase for older migration cohorts. However, panel (a) shows that this correlation remains constant regardless of migration age, with all β_a being close zero.

Panel (b) conducts a similar exercise using the share of women with at least middle school education in the destination regency as the outcome variable. This tests whether older migrants increasingly select locations with better education outcomes for women. Panel (b) shows no evidence of this, as all the interactions are close to zero.

In panel (c), I test whether older migrants from high-FLFP regencies exhibit differential changes in their migration motives. The increase in the birthplace persistence can be consistent with a shift in the nature of the move as girls grow older. Fortunately, the 1985 Intercensal Survey includes information on the self-reported motive of migration, distinguishing between work, education, and other reasons.[26] In panel (c), I narrow the sample to observations from the 1985 survey and use migration motives as outcomes. Due to the smaller sample size, I categorize migration ages into five-year bins for episodes before 15 years old.[27]

Panel (c) reveals little evidence of changing selection patterns in migration due to education (filled circles), as I cannot reject that all coefficients are jointly zero at the 95% confidence level. However, the figure suggests that women from regions with high FLFP seem to become more likely to move for work as they grow older (hollow circles). This is indeed a concern for my results. However, in appendix table A.11, I show that this change in migration motive is unlikely to drive the increase in birthplace persistence. If the birthplace persistence were driven by work-related migration, then the increase in the persistence should go away once I control for the work move dummy (or its interaction with age of migration dummies). Column (1) of table A.11 shows that, at baseline, staying up to 16 is associated with an increase of 4.9 percentage points in employment. Moreover, columns (2) and (3) indicate that three-quarters of the increase in birthplace persistence still remains after controlling for a work-migration dummy and interactions between migration age and the work-migration dummy.[28]

Finally, in panel (d), I show evidence on the economic background of early migrants using data

selection assumption holds. For instance, let's consider a scenario where constant selection holds during the ages from 6 to 14 but not outside of this range. In this case, I can still identify the exposure effects between 6 and 14 years old.

[26] It is worth noting that the survey does not specify whose job initiated the move, although they presumably refer to the respondent's own job. Moreover, although the Intercensal Survey bundles family-related reasons into "other", data from IFLS suggest that the great majority of moves for the "other" category are driven by family-related reasons.

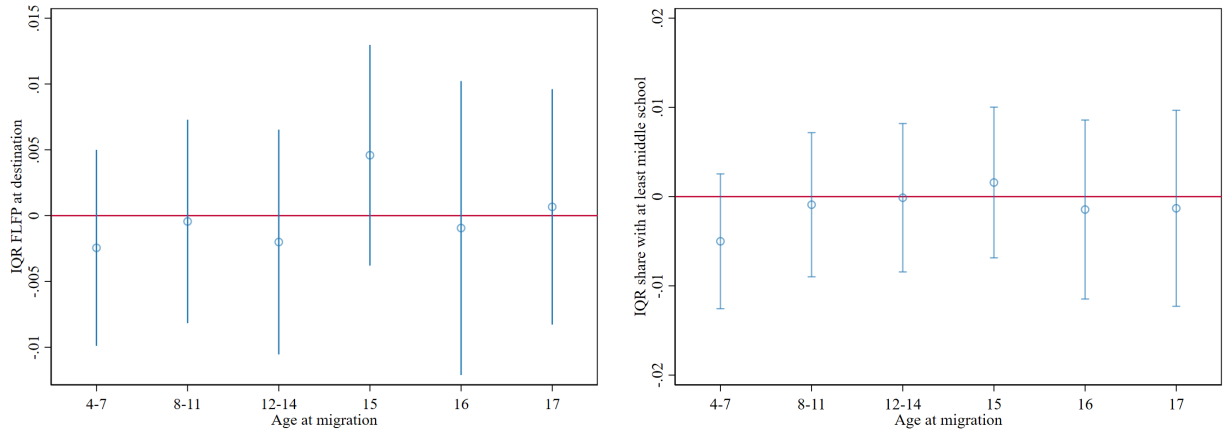
[27] Figure B.4 in the appendix confirms that the increase in birthplace persistence of employment also holds in this smaller sample.

[28] Although this increase is no longer statistically significant, the sample in Table A.11 is just one sixth of the sample in my baseline results.

Figure 6: Indonesia: women and selection by age of emigration

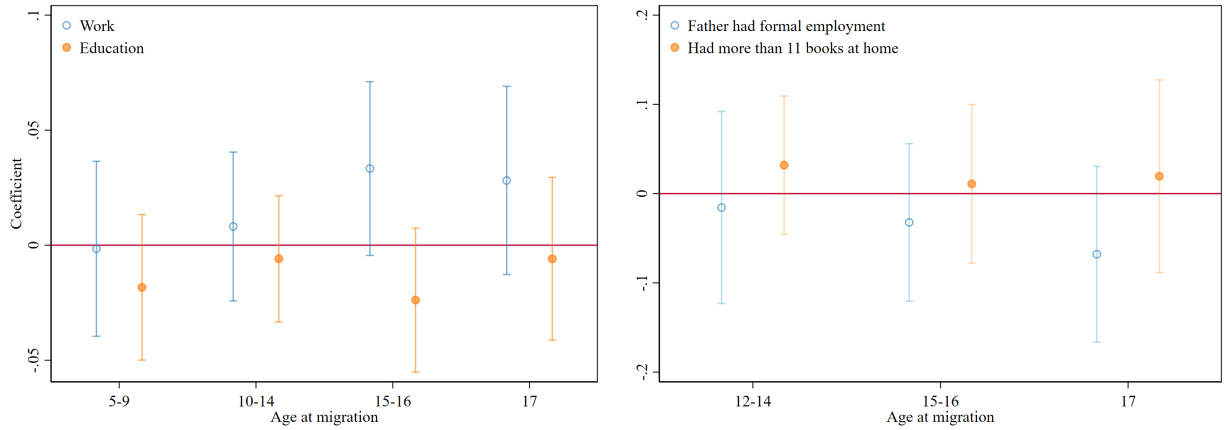
(a) FLFP at destination

(b) Share of women with at least middle school at destination



(c) Reason of migration

(d) Socioeconomic background



Notes: The figure displays the coefficients on the interactions between the age of emigration and FLFP at birthplace (β_a) from regression (5) for various outcomes. All coefficients can be interpreted as the change in the birthplace persistence coefficients relative to the slopes for the least exposed women. Each panel controls for the primary birthplace FLFP slope, age of migration, religion, education-level fixed effects, and a quadratic polynomial in age. In addition, panel (c) and (d) control for current regency fixed effects. Data on migration motive is available only on the 1985 Intercensal Survey, therefore panel (c) limits the sample to people in the 1985 survey. Due to the much smaller sample, panel (c) groups migration ages into 5 year cells for the earlier cohorts. Panels (a) to (c) use data from the Intercensal Survey, while panel (d) uses data from the IFLS. The smaller sample in the IFLS requires a different age binning in panel (d). Standard errors are clustered by the regency of birth. The figure shows 95% confidence intervals.

from the IFLS. The IFLS provides richer demographic information than the Intercensal Survey, but at the cost of a smaller sample and somewhat limited information on migration episodes at early ages. The IFLS lacks information on the exact age of migration for any move before 12 years old. Therefore, all slopes in panel (d) represent the difference in the FLFP slope relative to

those migrating before turning 12. The panel shows slopes of regressions where the outcomes are dummies of whether the father had formal employment, and whether she had more than 11 books at home growing up. In developing countries, formal jobs often offer better pay and benefits, while the number of books at home is used as a proxy for parental education level. If the birthplace effects were driven by selection in parental background, then I would expect a clear upward trend in the slopes for both outcomes. This would reflect that richer and more educated parents from high-FLFP regencies became more likely to migrate as their child grew older. However, there is little evidence of this, and I cannot reject that the slopes are jointly zero at the 95% confidence level.

5 Discussion: why does birthplace matter?

Having established that childhood exposure to birthplace has a strong effect on women's choices, the next task is establishing how. Here I examine the evidence supporting four mechanisms: (i) culture, norms, and learning, (ii) human capital, (iii) marriage and household formation, and (iv) changes in parental investments.

5.1 Culture, norms, and learning

The birthplace effects could reflect the internalization or learning of local norms and practices around women's work. The main rationale put forward by epidemiological approach research for using country of ancestry FLFP (or female employment) rates as the main regressor is that these rates capture variation in preferences, beliefs, and culture that help determine aggregate female employment and that can be transmitted across generations (Fernandez and Fogli, 2009).

In table 10 I use data from the Ethnographic Atlas (Murdock, 1967) to show that the regency FLFP capture variation in ancestral cultural practices and gender norms *within Indonesia*. In columns (1) to (3) I show results from regressing the regency FLFP rate on the prevalence of several traditional/pre-modern norms or practices and other regency characteristics. I include as regressors the prevalence of practices related to gender or marriage, namely: matrilocality, emphasis on female chastity, bride price, use of plow agriculture, polygamy, male agriculture. Column (1) shows that these variables are highly significant and they alone account for 30% in the variation of FLFP rates. Moreover, columns (2) and (3) show that these variables remain jointly significant when including additional controls such as the regency's industrial and age structure, and overall levels of education. In addition, appendix table A.6 shows that these practice are predictive of other female outcomes such as age at first marriage and their number of children, while columns (4) to (6) in table 10 show that they have little bite when using the regency's male FLP rate as the outcome.

Table 10: Indonesia: regency's ancestral norms and women's employment

	Women			Men		
Dep. var.: employment rate	(1)	(2)	(3)	(4)	(5)	(6)
Matrilocal	-0.16***	-0.13***	-0.12***	-0.01	0.02	0.01
	(0.04)	(0.03)	(0.03)	(0.02)	(0.01)	(0.01)
Emphasis on female chastity	-0.20***	-0.12***	-0.07*	-0.02	0.02	0.00
	(0.05)	(0.04)	(0.03)	(0.01)	(0.01)	(0.01)
Practices bride price	-0.11***	-0.05**	-0.05*	-0.01	0.01	0.00
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)
Plow agriculture	-0.14*	-0.08	-0.04	-0.02	0.01	0.01
	(0.06)	(0.05)	(0.04)	(0.01)	(0.01)	(0.01)
Polygamy	0.18***	0.15***	0.12***	0.03	0.01	0.02
	(0.05)	(0.04)	(0.04)	(0.02)	(0.01)	(0.01)
Agriculture is male only	0.03	0.10*	0.06	0.02	0.05***	0.01
	(0.05)	(0.04)	(0.04)	(0.01)	(0.01)	(0.01)
Share in agriculture		0.70***	0.98***		0.19***	0.15***
		(0.10)	(0.12)		(0.04)	(0.04)
Share in manufacture		0.66***	0.92***		0.21***	0.17***
		(0.13)	(0.12)		(0.05)	(0.05)
Share in services		0.77***	0.26		0.02	0.09
		(0.20)	(0.20)		(0.09)	(0.07)
Share urban			0.13			0.02
			(0.07)			(0.02)
In java			-0.05			-0.02*
			(0.02)			(0.01)
Age structure			✓			✓
Male's education			✓			✓
Joint significance of norms variables	15.52	9.32	9.40	2.01	3.42	2.23
Observations	258	258	258	258	258	258
R^2	0.29	0.52	0.69	0.04	0.58	0.73

Notes: Uses data from the 2010 Indonesian Census and the Ethnographic Atlas. Sample restricted to people aged 18-64 and aggregated to the regency level. Robust standard errors in parenthesis.

The evidence in appendix table 10 suggests that women born in high-FLFP locations are exposed to a distinct set of norms and cultural practices that could influence their choices and preference formation. In addition, my main results indicate that this exposure matters most during late childhood and early adolescence. This timing aligns well with evidence from psychology and economics which emphasizes that this is key period for preference formation when children are mature enough

to form their own opinions while remaining receptive to external influences (Markus and Nurius, 1986). For instance, Dhar et al. (2022) find long lasting effects from interventions targeting gender views of Indian teenagers and Olivetti et al. (2020) show that exposure to classmates' working mothers during secondary has long-term effects on women's work decisions in the US.

5.2 Human capital

Exposure to birthplace could affect women's labor supply via their career expectations and their educational investment. Being exposed to an environment where women are actively participating in economic activities could alter their career expectations and make them more likely to invest in further education. For example, Molina and Usui (2022) show that in Japanese municipalities with higher female participation rates, teenagers exhibit greater educational aspirations, leading to increased investment in schooling.

However, this channel is an unlikely driver for my results because high-FLFP regencies have worse educational outcomes for women (see appendix table A.7). Moreover, there is little evidence that women who stay longer in these regencies invest more in education. If schooling drove the patterns observed in figure 3, I should observe increasing persistence in regressions that use schooling measures as the outcome. However, appendix figure B.9 shows no evidence of this when the outcome is the likelihood of completing secondary school. Although the figure suggests an apparent increase in the likelihood of completing primary school, these slopes are imprecise, and I cannot reject the hypothesis that all of them are equal (i.e., null birthplace effects).[29]

5.3 Marriage and household formation

Previous research emphasizes the interaction between the husbands' background and women's labor market choices (Fernández et al., 2004; Blau et al., 2011). The patterns I document could be explained by high-exposure women selecting partners of different characteristics. In appendix figure B.10 I restrict the sample to women with identified husbands in the Intercensal Survey and use dummies indicating whether their husband possesses a certain characteristic as outcomes. I focus on five main traits: being an internal migrant, born in above-mean-FLFP regency, high-school graduate, employed, and salaried. Migrant and high-FLFP try to proxy for the husbands' background, while education, employment and salaried are intended to capture income. If high-exposure women were selecting husbands of different backgrounds, there should be a clear pattern in the slope estimates. The lack of such pattern in both panels of figure B.10 indicates that women with low and high exposure select partners with similar traits.

Appendix figure B.11 also tests whether women's choices are affected by husbands' exposure to high-FLFP regencies. Fernández et al. (2004) shows that the wives of men brought up by

[29] I also cannot reject that all slopes from 8 to 17 are the same. Additionally, the *employment* persistence coefficients remain fairly unchanged when I control for interactions between birthplace FLFP, age of migration, and completed primary dummies. If higher employment were mainly due to higher completion rates of primary school, the coefficients in figure 3 should flatten once I control for this triple interaction.

working mothers are more likely to work. If longer exposure to high-FLFP regencies also affects men's preferences, we should expected higher labor supply by their wives. In appendix figure B.11 I restrict the sample to couples where the husband is a migrant and use an specification similar to (4), but using interactions between husbands' migration age and his birthplace FLFP as main regressors. Although the the slope estimates are positive, suggesting that men's background is important for determining women's labor supply, there is little evidence that longer exposure translates into higher women's employment. In fact, the decline in the slopes from 0-5 to 6-11 would suggest the opposite, but the estimates are imprecise and I cannot reject the hypothesis that all the slopes are equal at the 95% confidence level.

5.4 Changes in parental investment

Molina and Usui (2022) suggests that exposure to local labor market opportunities influences parental investment in girls' education. There are two main ways through which parental investment could explain my results. Although I cannot fully discard these explanations, they do not seem very plausible in my context.

The first explanation is pure selection. The increasing persistence could reflect that parents who stayed longer in high-FLFP regencies happened to invest more in their children. However, this requires a complex pattern of selection that does not seem to be supported by the data. If parents who stayed longer in high-FLFP regencies invested more in their daughters' education, one would expect that girls from these locations came from families with higher socioeconomic backgrounds. However, panel (d) of figure 6 shows little evidence of selection based on parental socioeconomic background. Moreover, since high-FLFP regencies have worse outcomes, it is more likely that high-investment parents would leave these locations earlier rather than later.

Another possibility is that staying longer in these locations affected parental investment. However, there is little evidence that staying longer in these locations is associated with higher levels of education. Admittedly, investment could act through channels other than the level of schooling, but changes in investment would need to occur at a very specific time in the children's development.

6 Robustness

My results are robust to multiple variations in the estimation strategy. My main estimates limit the sample to women migrating up to 17 years old and source the birthplace FLFP rate from the 2010 Indonesian Census. Section 6.1 shows that I obtain similar results if I restrict the sample to women migrating up to 16, or up to 18 years old. Moreover, section 6.2 shows I get similar estimates when using the FLFP from the census prior to the Intercensal Survey year. In section 6.3, I address the possibility that my results are driven by early entry to the labor market. Finally, in section 6.4 I show evidence against marriage as a potential driver of my results.

6.1 Maximum age at migration in the sample

The sample in my main results includes all women who migrated at 17 years old or younger. One concern regarding this sample selection is that women migrating at the ages of 17 or 18 may have been more inclined to consider their job prospects when making their location choices.

To evaluate whether this is a concern, appendix table A.8 displays results where I limit the sample to various maximum ages of migration. The table displays estimates of the employment effect of longer stays for two women: one born in a regency at the 75th percentile of the FLFP distribution and another born at the 25th percentile under the assumption that they stayed at their regency of birth until they were 16. That is, these estimates are the difference between the gaps at 16 and 0 years old.

Varying the maximum age of migration within my sample has minimal overall effects on my birthplace effect estimates. Further restricting the sample to people who migrated at 16 or younger in column (1), or relaxing it to people migrating at 18 or younger in column (3) generates results close to those of my baseline sample in column (2). Furthermore, the birthplace persistence coefficients (b_a) from the three samples exhibit similar behavior and are quite similar in magnitude, with the bulk of the increase happening between the ages of 6 to 14 years old. I interpret this as evidence that my results are not driven by different selection patterns for the oldest migrants

6.2 Year of reference for the birthplace FLFP

My main results source the female labor force participation rates for the regency of birth from the 2010 Indonesian Census. Although FLFP rates are very persistent (see section 3.3), the rates in the 2010 census could be a poor proxy for the FLFP rates "experienced" by the women in the 1985 and 1995 Intercensal Surveys.

Appendix figure B.12 shows that my results are robust changes in the reference year I use for the FLFP rates. The dark red (filled) circles show estimates when I source the birthplace FLFP rates from the first census prior to the Intercensal Survey year,[30] while the orange (hollow) circles use the 2010 rates from my baseline specification. The results for both women in panel (a) and men in panel (b) are fairly similar under both strategies.

6.3 Child labor

A potential concern regarding the birthplace effects is that they might be driven by child labor. While contemporary rates of child labor in Indonesia are generally low, this was not the case in the 1980s. The rates of children aged 10-14 working declined from 11% in 1980 to approximately 3% in 2010.[31]

Moreover, the strong positive correlation between FLFP and female child labor rates (FCLR) raises the possibility that birthplace effects could be indicative of early entry into the labor market.

[30] That is: 1980 census for the 1985 survey, 1990 for 1995, and 2000 for the 2005 Intercensal Survey.

[31] Information about work is available only for people aged 10 or more.

In appendix figure B.13 I show the rates of female child labor for 1980, 1990 and 2010 against FLFP by regency. In 1980 and 1990, regencies with high FLFP also exhibited high rates of child labor. Although this correlation is weaker in 2010, it remains positive.

However, the birthplace effects are not driven by the prevalence of female child labor in the regency. Appendix figure B.14 shows estimates of the birthplace persistence coefficients when including the birthplace FCLR rate as a control. The baseline estimates in orange (hollow circles) control for regency-year-age fixed effects, a quadratic polynomial on age, and education fixed effects. The estimates in red (filled circles) add as a control the birthplace FCLR rate, while the purple estimates (plus sign markers) control for interactions between the migration age and the birthplace FCLR rate. Notably, the estimates are largely unaffected by the inclusion of the child labor rates.

6.4 Marriage-related migration

Marriage could drive the birthplace persistence in employment if there is an interaction between place of origin, age of migration and marriage. Marriage at early ages is associated with worse health and economic outcomes for women (Corno and Voena, 2023). If women from low-FLFP regencies are more likely to marry and migrate around ages 12-15, this could explain why they are less likely to work later in life.

In appendix figure B.15, I use detailed marriage history data from the IFLS to explore whether marriage-related migration drives the employment patterns. First, in panel (a) I show the relationship between migration and women's marriage.[32] I classify a migration episode as marriage-related if the respondent married the year before, the year, or the year after she migrated. I then regress the marriage-related dummy on age of migration fixed effects and interactions between the age of migration and birthplace FLFP. The plotted interaction estimates in panel (a) show a clear decline in the coefficients, suggesting that women from high-FLFP regencies become less likely to migrate due to marriage the longer they stay in their origin. This could explain the employment patterns I document.

Nevertheless, panel (b) shows no evidence that selection on marriage-related migration explains the effects on employment. The panel displays the baseline birthplace effects from the IFLS (red/hollow circles) along with results that control for interactions between the age of migration and the marriage-related migration dummy, interactions between the age of migration, the marriage-related dummy, and birthplace FLFP (orange/filled circles). If the selection in migration motive drove the birthplace effects, these effects should decline once I account for the marriage motive. Nevertheless, the patterns remain virtually unchanged.

7 Conclusions

In this paper, I provide new evidence on the large and persistent geographic variation in women's labor supply within multiple countries at different levels of development. I then focus on Indonesia,

[32]The IFLS collected marriage-history information to women-only.

a large developing country home to more than 118 million women

I link childhood exposure to Indonesia's spatial inequality in FLFP to women's adult labor market outcomes. Using the traditional "epidemiological" approach from previous literature, I first document that place of birth is highly predictive of the labor supply choices of internal female migrants currently living in the same labor market. That is, women currently exposed to the same labor market make very different choices when they come from places with different rates of FLFP.

I use rich data on migration history to argue that longer exposure to these locations affects women's work choices. By using data on the age of migration, I show that women who were exposed longer to high-FLFP labor markets are more likely to work as adults compared to those exposed longer to low-FLFP locations. These effects are large and are driven by exposure during the formative years between the ages of 6 and 14 years old. In all, Staying in a location at the 75th percentile of FLFP during the period of 6 to 14 years of age makes women 5 percentage points more likely to work than those born in a location at the 25th percentile. The validity of these estimates hinges on the assumption that omitted variable bias is constant across migration age cohorts, which is supported by the data.

These results are consistent with the internalization of local gender norms. Longer exposure to high-FLFP locations is also associated with small delays in marriage and lower fertility. Moreover, the effects are concentrated in formative ages when norms are malleable. The data do not support investment in education or selection based on family background as the main drivers of these results. Nevertheless, additional research is necessary to further understand the channels through which local labor markets affect women's choices.

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A Tables

Table A.1: Dispersion in regional employment rates within countries

	Women			Men			Pop.	Obs.
Country	**IQR**	**SD**	**Mean**	**IQR**	**SD**	**Mean**		
Benin	0.35	0.19	0.44	0.08	0.06	0.76	57,764	77
Zimbabwe	0.30	0.19	0.59	0.13	0.08	0.77	70,597	88
Guinea	0.29	0.19	0.52	0.11	0.09	0.84	22,567	209
China	0.28	0.17	0.71	0.14	0.10	0.85	266,748	2,845
Nepal	0.26	0.17	0.63	0.05	0.03	0.81	191,443	72
Ecuador	0.24	0.13	0.43	0.03	0.03	0.83	104,465	78
Zambia	0.23	0.15	0.50	0.09	0.07	0.64	108,098	55
Indonesia	0.22	0.14	0.53	0.05	0.04	0.87	533,867	268
Myanmar	0.21	0.13	0.51	0.07	0.05	0.86	83,531	362
Panama	0.20	0.12	0.33	0.04	0.08	0.80	56,049	35
Tanzania	0.20	0.12	0.69	0.09	0.05	0.82	178,632	113
Vietnam	0.19	0.12	0.82	0.06	0.06	0.90	79,146	674
Brazil	0.19	0.11	0.48	0.19	0.11	0.73	59,010	2,040
Mexico	0.17	0.11	0.30	0.09	0.08	0.80	27,853	2,330
South Africa	0.16	0.11	0.30	0.06	0.06	0.53	138,127	224
Cambodia	0.16	0.11	0.84	0.08	0.05	0.90	50,186	174
Thailand	0.16	0.11	0.81	0.08	0.06	0.88	58,290	670
Costa Rica	0.16	0.08	0.37	0.05	0.04	0.73	48,673	55
Nicaragua	0.16	0.09	0.31	0.10	0.06	0.81	38,849	68
Argentina	0.15	0.10	0.53	0.08	0.06	0.83	75,022	312
Kenya	0.15	0.10	0.68	0.06	0.06	0.79	513,569	35
Sierra Leone	0.15	0.11	0.71	0.15	0.09	0.75	27,333	126
Togo	0.14	0.10	0.72	0.08	0.05	0.80	75,345	37
Philippines	0.13	0.10	0.30	0.08	0.06	0.82	40,423	1,274
Mauritius	0.13	0.20	0.53	0.03	0.06	0.83	16,626	50
Bolivia	0.12	0.06	0.58	0.05	0.03	0.86	70,323	80
Chile	0.12	0.08	0.51	0.05	0.04	0.79	57,826	192
Spain	0.11	0.08	0.51	0.09	0.06	0.61	105,902	286
Malaysia	0.11	0.07	0.38	0.06	0.04	0.84	91,509	133
Greece	0.10	0.06	0.43	0.05	0.04	0.66	42,492	156
Uganda	0.10	0.10	0.83	0.05	0.05	0.89	111,479	136
USA	0.09	0.07	0.67	0.10	0.07	0.77	202,635	722
Ghana	0.08	0.05	0.76	0.06	0.05	0.78	122,422	102
Senegal	0.06	0.05	0.19	0.09	0.06	0.58	233,811	27
Bangladesh	0.02	0.03	0.06	0.04	0.03	0.87	1,335,491	60

Notes: SD and IQR stand for Standard Deviation and Interquartile Range. The table shows statistics for all countries in IPUMS International with geographic data below the state/province level. Rows are ordered from the highest to the lowest IQR in women's employment rates. For all countries I use census sample from 2010 or the closest available year. I aggregate data at the smallest geographical unit available, except for the USA where I use Commuting Zones as in Autor and Dorn (2013). Column (7) shows the total population for the average geographic unit in each country. I show the unweighted cross-locality means which –might– differ from the national-level means.

Table A.2: Dispersion in employment and paid employment rates for selected countries

	All employment		Paid employment		
Country	**IQR**	**Mean**	**IQR**	**Mean**	**Observations**
Benin	0.35	0.44	0.37	0.41	77
Zimbabwe	0.30	0.59	0.30	0.59	88
Guinea	0.29	0.52	0.24	0.43	209
Nepal	0.26	0.63	0.27	0.62	72
Ecuador	0.24	0.43	0.23	0.42	78
Zambia	0.23	0.50	0.06	0.27	55
Indonesia	0.22	0.53	0.12	0.34	268
Panama	0.20	0.33	0.21	0.33	35
Tanzania	0.20	0.69	0.21	0.67	113
Vietnam	0.19	0.82	0.11	0.72	674
Brazil	0.19	0.48	0.20	0.46	2,040
Mexico	0.17	0.30	0.16	0.27	2,330
Thailand	0.16	0.81	0.09	0.69	670
South Africa	0.16	0.30	0.16	0.30	224
Costa Rica	0.16	0.37	0.16	0.37	55
Nicaragua	0.16	0.31	0.16	0.31	68
Argentina	0.15	0.53	0.15	0.53	312
Kenya	0.15	0.68	0.15	0.68	35
Sierra Leone	0.15	0.71	0.16	0.66	126
Togo	0.14	0.72	0.17	0.59	37
Philippines	0.13	0.30	0.12	0.28	1,274
Mauritius	0.13	0.53	0.13	0.52	50
Bolivia	0.12	0.58	0.12	0.56	80
Chile	0.12	0.51	0.12	0.51	192
Malaysia	0.11	0.38	0.11	0.38	133
Spain	0.11	0.51	0.11	0.50	286
Greece	0.10	0.43	0.10	0.43	156
Uganda	0.10	0.83	0.12	0.76	136
Ghana	0.08	0.76	0.08	0.61	102
Senegal	0.06	0.19	0.05	0.17	27
Bangladesh	0.02	0.06	0.02	0.06	60

Notes: IQR stands for Interquartile Range. The table shows data from all countries in table A.1 with data that distinguishes unpaid and family workers from other worker types.

Table A.3: Indonesia: number of migrant women by survey year and migration age cells

	Survey year			
Age cell	**1985**	**1995**	**2005**	**Total**
0-3	1,071	1,635	1,539	4,245
4-8	1,495	1,606	1,988	5,089
8-12	1,818	2,123	2,386	6,327
12-14	1,884	2,547	2,624	7,055
15	1,258	1,341	1,501	4,100
16	1,145	1,602	1,628	4,375
17	1,317	2,038	2,195	5,550
18	1,544	2,417	2,655	6,616
Total	11,532	15,309	16,516	43,357

Notes: the table shows the number of migrant women by survey year and migration age cell. Data from the 1985, 1995 and 2005 Intercensal Surveys.

Table A.4: Indonesia: estimates birthplace persistence on men's labor supply using IFLS data

	(1)	(2)	(3)	(4)
Women's employment rate at birthplace (p_o)	0.01	0.04	0.05*	0.04
	(0.03)	(0.03)	(0.03)	(0.03)
Mean employment rate	0.90	0.90	0.90	0.90
Implied IQR gap	0.00	0.01	0.01	0.01
Year FE	✓	✓	✓	✓
Regency FE	✓	✓	✓	✓
Age		✓	✓	✓
Religion			✓	✓
Education				✓
Observations	60,126	60,126	60,126	60,126
N individuals	6,293	6,293	6,293	6,293
R^2	0.05	0.17	0.17	0.18

Notes: Uses data from IFLS. Sample restricted to men residing outside their birthplace. Implied IQR gap shows the implied employment gap between someone born at a regency at the 75th percentile of employment rate and someone born at the 25th percentile. The IQR of the FLFP rate across regencies is of 22 percentage points. Standard errors clustered by regency of origin. When indicated, the regressions control for a quadratic polynomial in age, and fixed-effects for seven religion and for education categories. Standard errors clustered by regency of origin.

Table A.5: Indonesia: estimates birthplace persistence on labor supply for men who migrated young

	(1)	(2)	(3)
Female LFP birthplace ($p_{b(i)}$)	0.20***	0.16***	0.13***
	(0.05)	(0.04)	(0.03)
Mean employment rate	0.86	0.86	0.86
Implied IQR gap	0.04	0.03	0.03
Regency-year FE	✓	✓	✓
Age		✓	✓
Education			✓
Observations	31,718	31,718	31,718
R^2	0.10	0.27	0.29

Notes: This table uses data from the pooled 1985, 1995, and 2005 Intercensal Surveys and restricts the sample to men who migrated before they turned 18. The implied IQR gap shows the implied employment gap between someone born at a regency in the regency at 75th percentile of employment rate and someone born in the regency at the 25th percentile. The IQR of FLFP rates across regencies is 22 percentage points. Standard errors are clustered by regency of birth. When applicable, regressions control for a quadratic polynomial in age and fixed effects for four education categories.

Table A.6: Indonesia: ancestral norms and women's marriage and fertility

	Age at first marriage			**Number of children born**		
	(1)	(2)	(3)	(4)	(5)	(6)
Matrilocal	-0.42	-1.04***	-0.90***	0.10	0.20	0.26*
	(0.34)	(0.29)	(0.27)	(0.12)	(0.12)	(0.12)
Emphasis on female chastity	-1.71***	-2.57***	-1.71***	-0.43**	-0.23	-0.32*
	(0.30)	(0.29)	(0.25)	(0.14)	(0.13)	(0.15)
Practices bride price	1.14***	0.91***	0.57**	0.23***	0.30***	0.33**
	(0.18)	(0.16)	(0.18)	(0.07)	(0.08)	(0.13)
Plow agriculture	0.37	-0.25	-0.38	-0.02	0.09	-0.04
	(0.54)	(0.60)	(0.54)	(0.16)	(0.15)	(0.14)
Polygamy	1.11*	1.33*	1.09*	0.34*	0.29*	0.34**
	(0.55)	(0.58)	(0.54)	(0.13)	(0.12)	(0.12)
Agriculture is male only	0.18	-0.67	-0.98*	-0.54***	-0.35*	-0.06
	(0.41)	(0.37)	(0.41)	(0.16)	(0.14)	(0.17)
Share in agriculture		-2.61**	0.20		1.15**	0.91*
		(0.89)	(1.01)		(0.37)	(0.44)
Share in manufacture		-1.22	1.43		0.48	-0.12
		(1.15)	(1.02)		(0.43)	(0.53)
Share in services		2.17	-1.52		0.90	1.79
		(2.07)	(1.84)		(0.84)	(0.91)
Share urban			1.07			-0.26
			(0.64)			(0.23)
In java			-0.66**			0.28
			(0.22)			(0.17)
Age structure			✓			✓
Male's education			✓			✓
Observations	258	258	258	258	258	258
R^2	0.32	0.60	0.76	0.22	0.36	0.45
F joint significance of norms variables	20.68	31.06	13.88	19.10	9.85	4.59

Notes: Uses data from the 2005 Intercensal Survey, the 2010 Indonesian Census and the Ethnographic Atlas. Sample restricted to women aged 18-64. Robust standard errors in parenthesis.

Table A.7: Indonesia: Women in high FLFP regencies have worse educational outcomes

Regency group	**Years of schooling** (1)	**Primary completed** (2)	**Secondary completed** (3)
Low FLFP	7.86	0.78	0.30
	(0.13)	(0.01)	(0.01)
High FLFP	6.82	0.70	0.21
	(0.13)	(0.01)	(0.01)
Observations	258	258	258

Notes: This table uses data from the 2005 Intercensal Survey. I split regencies at the median of the female employment rate.

Table A.8: Indonesia: birthplace effect estimates for different migration age samples

	Maximum age of migration		
	18	**17**	**16**
	(1)	(2)	(3)
Effect estimate 0-15 years old	0.039	0.040	0.041
	(0.025)	(0.025)	(0.025)
Regency'age-year FE	✓	✓	✓
Age	✓	✓	✓
Education	✓	✓	✓
Observations	42,394	35,874	30,423
R^2	0.16	0.16	0.16

Notes: This table shows the implied gap in the likelihood of employment for two women, one born in a regency at the 75th percentile of the FLFP distribution, and another born in a regency at the 25th percentile, under the assumption they stayed in their birthplace until they turn 15. Columns differ only in the maximum age of migration for the women in the sample. The estimation uses data from the pooled 1985, 1995 and 2005 Intercensal Surveys and restricts the sample to women who reside outside their birthplace. Standard errors are clustered by the regency of birth. All regressions regressions control for a quadratic polynomial in age and fixed effects for four education categories.

Table A.9: Female labor force participation rages by country: IPUMS vs ILOSTAT

Country	**IPUMS (ages 18-64)**	**ILOSTAT (ages 15+)**	**Difference**
Cambodia	0.82	0.81	0.01
China	0.74	0.64	0.10
Indonesia	0.50	0.51	-0.01
Malaysia	0.43	0.43	-0.00
Myanmar	0.50	0.53	-0.03
Philippines	0.33	0.48	-0.15
Thailand	0.77	0.64	0.13
United States	0.67	0.58	0.10
Vietnam	0.79	0.72	0.07

Notes: Uses data from IPUMS international and ILOSTAT. I restrict the sample in IPUMS to people aged between 18-64 years old.

Table A.10: Source IPUMS samples for cross-country data

Country	**Geographic unit**	**Years of sample**	
Argentina	Department	2010	2001
Bangladesh	Upazila	2011	2001
Benin	Commune	2013	2002
Brazil	Municipality	2010	2000
Cambodia	District	2013	2008
Chile	Department	2017	2002
China	Prefecture	2000	
Costa Rica	Cantón	2011	2000
Ecuador	Cantón	2010	2001
Ghana	District	2010	2000
Greece	Municipality	2011	2001
Guinea	Sub-prefecture	2014	
Indonesia	Regency	2010	2000
Kenya	District	2009	1999
Malaysia	District	2000	1991
Mauritius	Municipal ward	2011	2000
Mexico	Municipality	2010	2000
Myanmar	Township	2014	
Nepal	Municipality	2005	1995
Panama	District	2010	2000
Philippines	Municipality	2010	2000
Senegal	Department	2013	2002
Sierra Leone	Sierra Leone	2015	2004
South Africa	Municipality	2011	
Spain	Municipality	2011	2001
Tanzania	District	2012	2002
Thailand	District	2000	1990
Togo	Prefecture	2010	
Uganda	County	2014	2002
USA[1]	Commuting zone	2012	
Vietnam	District	2009	2001
Zambia	Constituency	2010	2000
Zimbabwe	District	2012	

Notes: the table details the source samples from the cross-country data in IPUMS International. All cross-country comparisons are based on the most recent sample. The less recent samples are used only for cross-country comparison of employment rate persistence. [1]USA data for 2010 comes from the 5-year ACS sample for 2012.

Table A.11: Indonesia: birthplace effect estimates for different migration age samples

	(1)	(2)	(3)
Effect estimate 0-16 years old	0.049*	0.037	0.037
	(0.024)	(0.024)	(0.024)
Work move		✓	✓
Work move× Migration age			✓
Migration age FE	✓	✓	✓
Regency FE	✓	✓	✓
Age	✓	✓	✓
Religion	✓	✓	✓
Education	✓	✓	✓
Observations	11,532	11,532	11,532
R^2	0.11	0.15	0.15

Notes: This table shows the implied gap in the likelihood of employment for two women, one born in a regency at the 75th percentile of the FLFP distribution, and another born in a regency at the 25th percentile, under the assumption they stayed in their birthplace until they turn 16. Columns differ only in the maximum age of migration of the women in the sample. The estimation uses data from the Intercensal Survey and restricts the sample to women who reside outside their birthplace. Standard errors are clustered by the regency of birth. All regressions regressions control for a quadratic polynomial in age and fixed effects for five religious and four education categories.

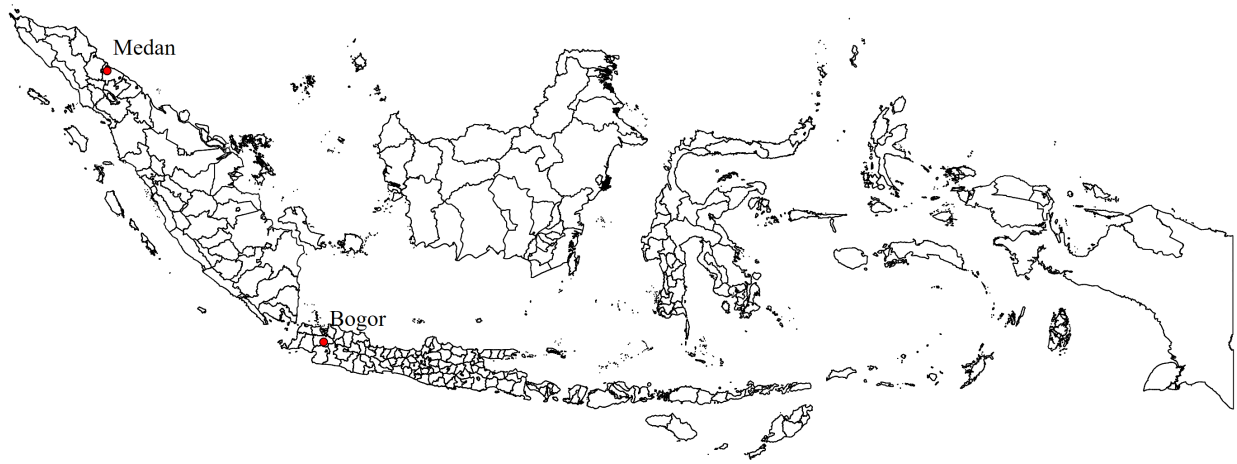
Table A.12: Indonesia: estimates of birthplace persistence for women using different regency samples

	(1)	(2)	(3)	(4)
Women's employment rate at birthplace (p_b)	0.32***	0.34***		
	(0.03)	(0.03)		
Migration age $\times p_b$				
0 to 2			0.18*	0.15
			(0.08)	(0.08)
3 to 5			0.21*	0.23*
			(0.10)	(0.10)
6 to 8			0.14	0.10
			(0.08)	(0.08)
9 to 11			0.19**	0.23**
			(0.07)	(0.07)
12 to 14			0.38***	0.41***
			(0.07)	(0.08)
15 to 16			0.35***	0.36***
			(0.06)	(0.06)
17			0.39***	0.38***
			(0.06)	(0.06)
18			0.33***	0.36***
			(0.06)	(0.06)
Sample	All regencies	Regency panel	All regencies	Regency panel
Regency-year FE	✓	✓	✓	✓
Age	✓	✓	✓	✓
Religion	✓	✓	✓	✓
Education	✓	✓	✓	✓
Age of migration FE			✓	✓
Observations	66,544	57,995	26,841	23,216
R^2	0.09	0.09	0.09	0.08

Notes: This table uses data from the Intercensal Survey and restricts the sample to women aged 18 to 64, who reside outside their birthplace. Columns (1) and (3) reproduce the results from Table **??** and Figure 3. Columns (2) and (4) restrict further restrict the sample to people residing in the 189 regencies covered by all three Intercensal surveys. Standard errors are clustered by regency of origin. When applicable, regressions control for a quadratic polynomial in age and fixed effects for five religious and four education categories.

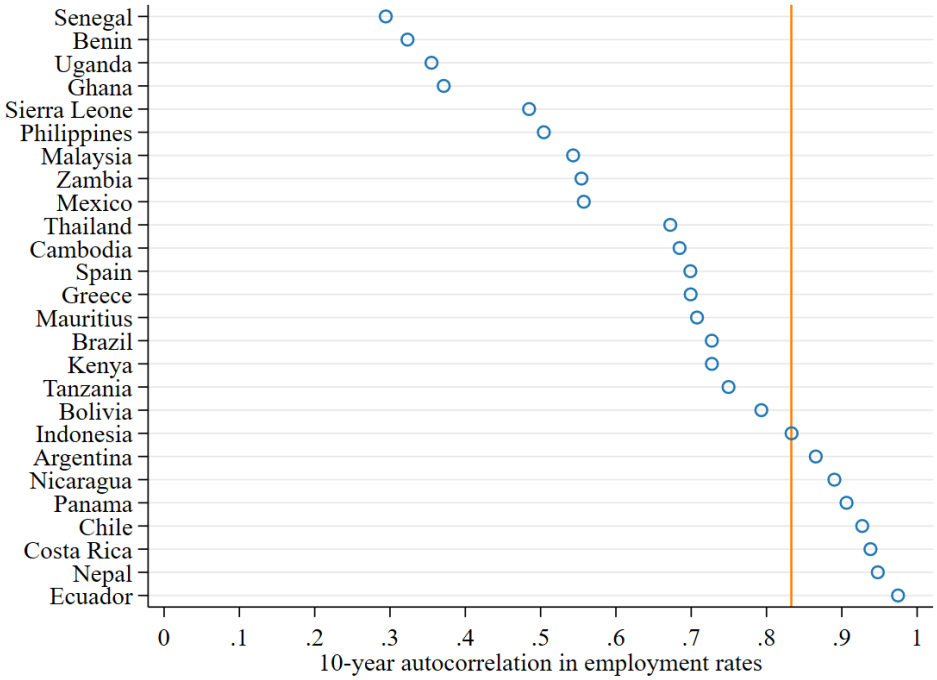
B Figures

Figure B.1: Indonesian regencies



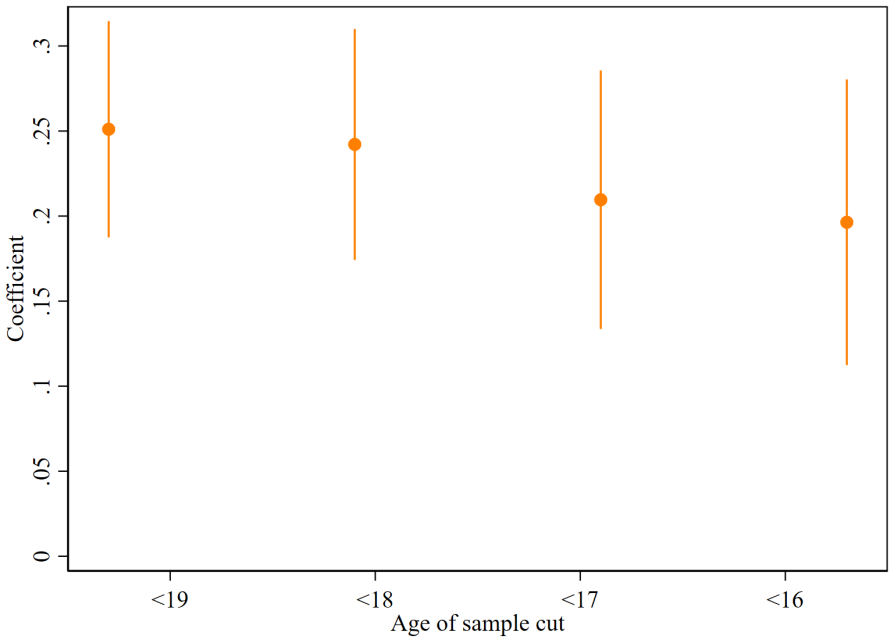
Note: The figure shows the 268 regency aggregates with consistent boundaries between 1970 and 2018. Boundaries obtained from IPUMS International. It highlights with red dots the locations of the city of Medan and Bogor regency. Medan, the capital and largest city in the province of North Sumatra, is the third most populous city in Indonesia as of 2020 (Brinkhoff, 2022). Bogor, with over five million people, borders the Jakarta metropolitan area.

Figure B.2: 10-year autocorrelation in female employment rates at the district level for selected countries



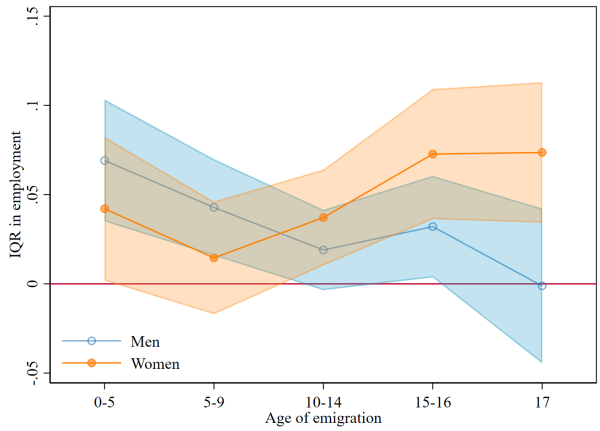
Notes: The figure shows the 10-year autocorrelation in female employment rates. I aggregate data at the smallest geographical unit available which often corresponds to a district/county. Data from IPUMS international.

Figure B.3: Estimates of birthplace persistence for different emigration age cutoffs



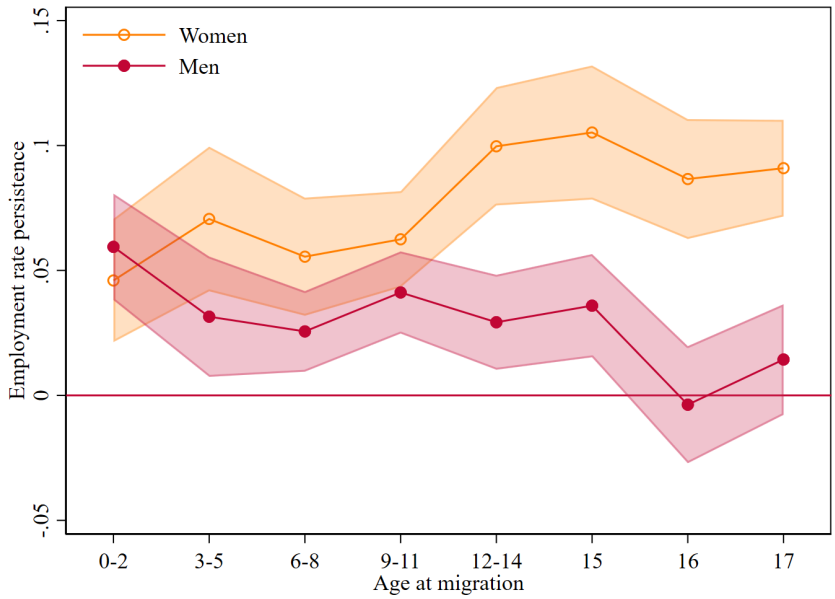
Note: This figure uses data from the Intercensal Survey and restricts the sample to women who reside outside their birthplace and who left before they turned 19. Standard errors are clustered by regency of origin. All regressions control for a quadratic polynomial in age and fixed effects for five religious and four education categories. The figure shows 95% confidence intervals.

Figure B.4: Indonesia: birthplace persistence estimates in the 1985 Intercensal Survey



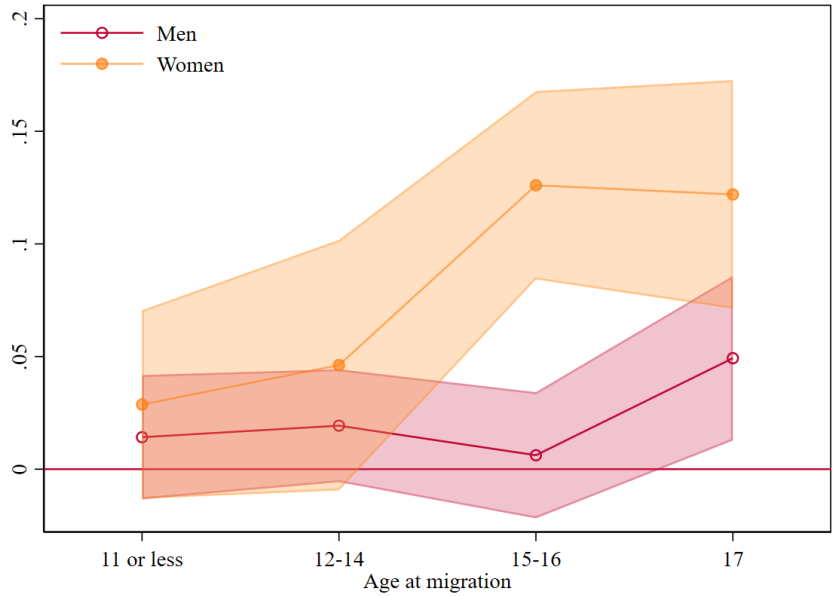
Notes: The figure shows estimates of the birthplace persistence coefficients by age of emigration $\boldsymbol{b_a}$ when restricting the sample to the 1985 Intercensal Survey. The regressions control for current regency-by-year fixed effects, a quadratic polynomial on age, and religion and education-level fixed-effects. The figure shows 90% confidence intervals

Figure B.5: Indonesia: length of stay and likelihood of employment



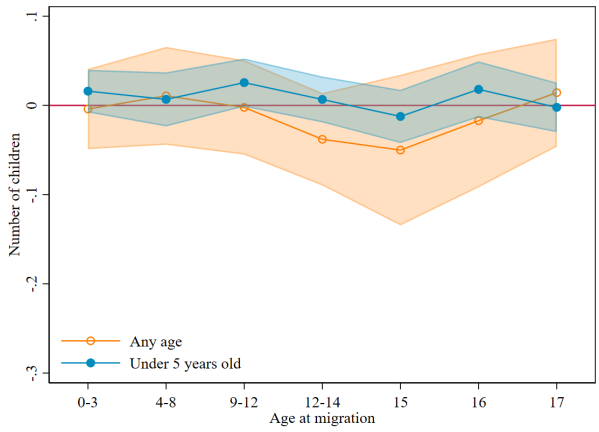
Note: The figure shows estimates of the birthplace persistence coefficients by age of migration $\boldsymbol{b_a}$. The coefficients are rescaled so that they can be interpreted as the implied gap between women from 75th and 25th percentile regencies. The regression controls for regency-by-year fixed-effects, migration age fixed effects, interactions between destination FLFP and migration age fixed effects, a quadratic polynomial on age, and education level fixed-effects. Standard errors are clustered by regency of birth. The figure shows 90% confidence intervals. It uses data from 1985, 1995 and 2005 Intercensal surveys.

Figure B.6: Birthplace persistence in the IFLS



Note: Uses data from IFLS. The regression controls for year, regency of residency, year, religion, and education FE, and a quadratic polynomial on age. Standard errors clustered by the regency of birth

Figure B.7: Indonesia: Men's length of stay and number of children in the household

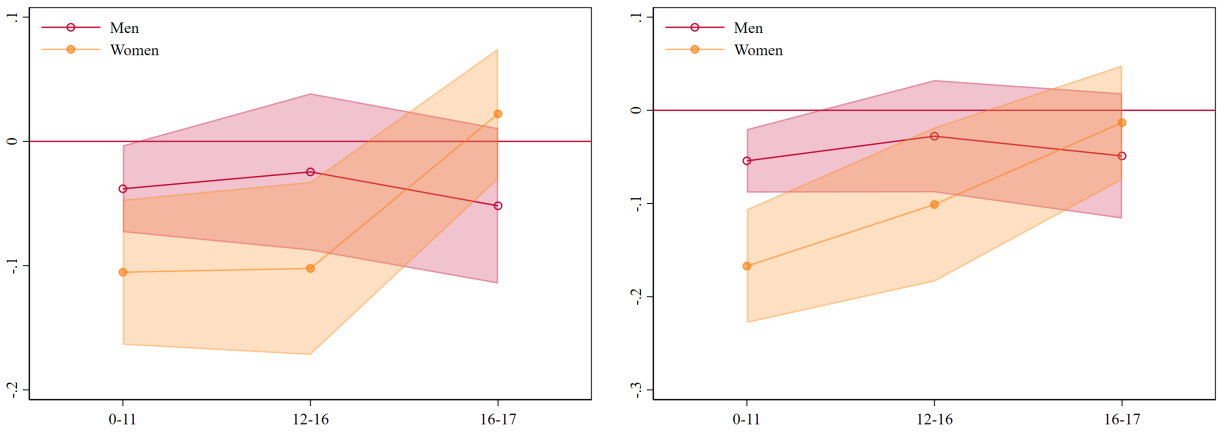


Note: The figure shows estimates of the birthplace persistence coefficients by age of emigration $\boldsymbol{b_a}$. It uses data data from the 1985, 1995 and 2005 Intercensal surveys. The regression controls for current regency-migration age-year fixed-effects, a quadratic polynomial on age, and education level fixed effects. Standard errors clustered by regency of birth. The figure shows 90% confidence intervals.

Figure B.8: Indonesia: earnings and length of stay at birthplace

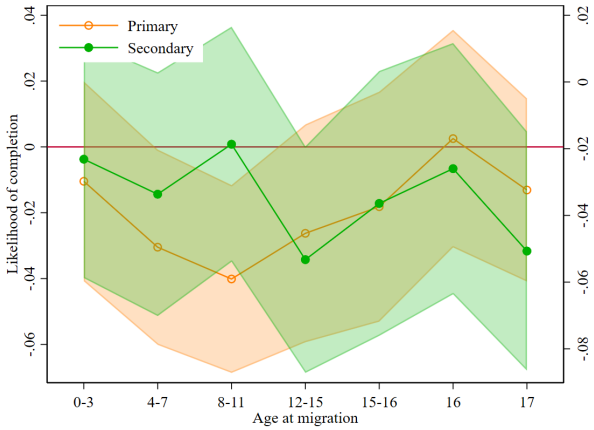
(a) Monthly earnings

(b) Hourly wages



Note: Data from 1995 intercensal survey. The regression controls for current regency fixed-effects, a quadratic polynomial on age, and education level fixed-effects. The figure shows 90% confidence intervals.

Figure B.9: Indonesia: education by length of stay

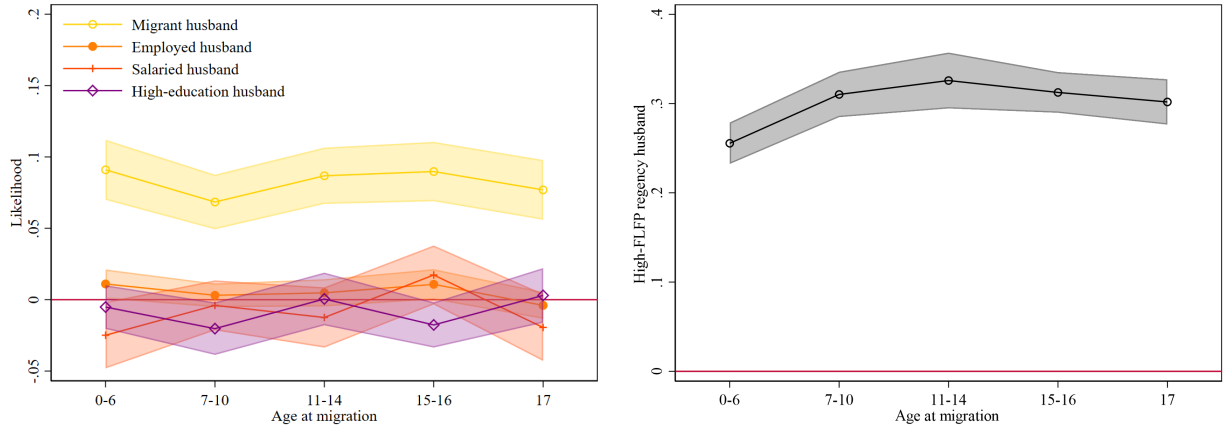


Note: The figure show the coefficients on the interactions between age of emigration and birthplace FLFP. Errors are clustered by regency of birth. The figure shows 90% confidence intervals. Data from the pooled 1985, 1995 and 2005 Intercensal Surveys.

Figure B.10: Indonesia: marriage and husband characteristics

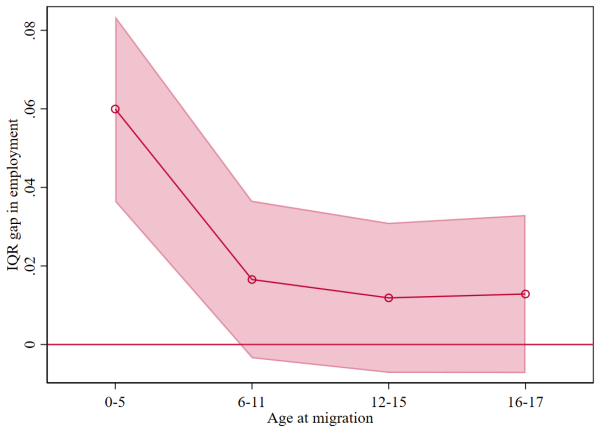
(a) Probability of ever-marrying

(b) Husband born in high-FLFP regency



Note: Data from 1995 intercensal survey. The regression controls for current regency fixed-effects, a quadratic polynomial on age, and education level fixed-effects. The figure shows 90% confidence intervals Figure generated on 2 Aug 2024 at 12:25:55.

Figure B.11: Indonesia: husbands'length of stay and wives' labor supply

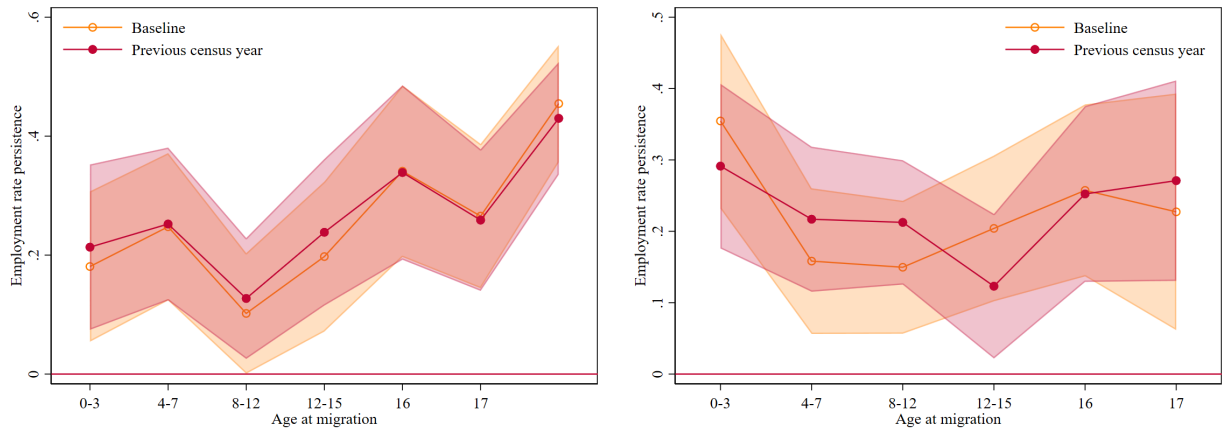


Note: The figure shows estimates of the birthplace persistence coefficients by age of emigration $\boldsymbol{b_a}$ when regressing the wive's employment status on interactions between her husband's migration age and his birthplace FLFP. The regression also controls for interactions between the husband's migration age and his current regency FLFP, quadratic polynomial on the wive's age, wive's education fixed effects, a migrant wive dummy, and interactions between the migrant wive dummy and her birthplace FLFP. The figure uses data from the pooled 1985, 1995 and 2005 Intercensal Surveys. Standard errors clustered by regency of birth. The figure shows 90% confidence intervals.

Figure B.12: Indonesia: length of stay labor supply for different measures of birthplace FLFP

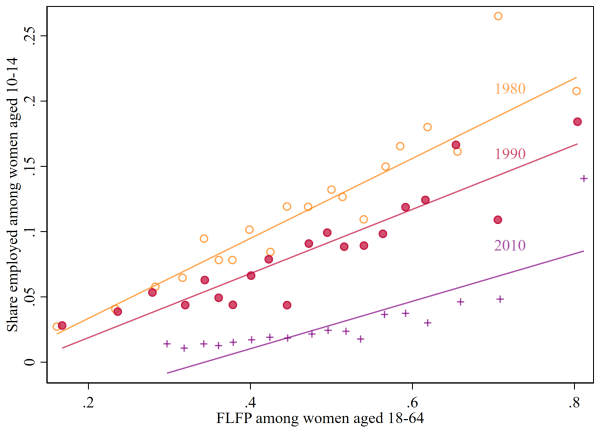
(a) Women

(b) Men



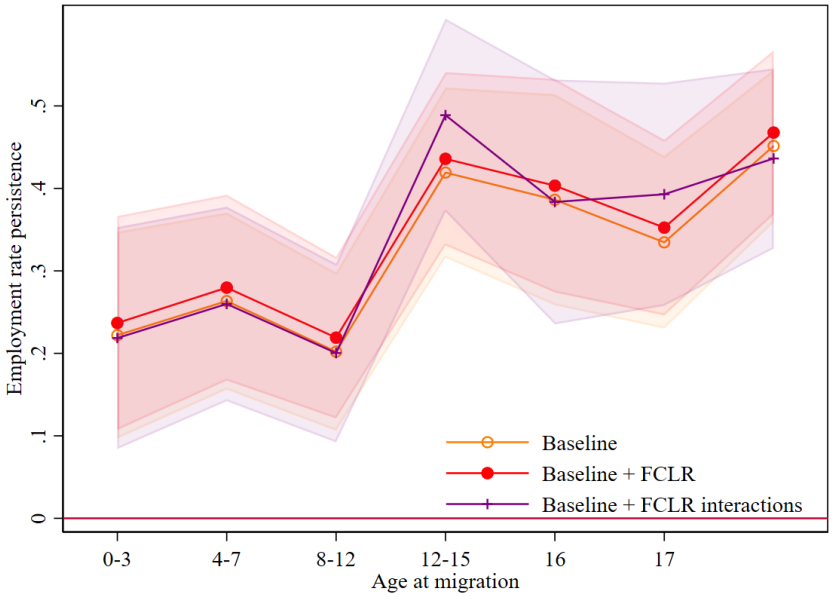
Notes: The figure shows estimates of the birthplace persistence coefficients by age of migration $\boldsymbol{b_a}$ for different measures of the birthplace FLFP rate. The baseline results source the regency FLFP rate from the 2010 Indonesian Census, while the darker estimates source it from the first census year prior to the Intercensal Survey year. Panel (a) shows estimates for women, while Panel (b) shows estimates for women. The figure uses individual-level data from the pooled 1985, 1995 and 2005 Intercensal surveys. All regressions control for current regency-migration age-year fixed effects, a quadratic polynomial on age, and education fixed effects. The figure shows 90% confidence intervals. Standard errors clustered by regency of birth.

Figure B.13: Indonesia: female child labor and female employment by regency



Note: The figure compares the employment rates of women between the ages of 10-14 and those aged 18 to 64. Censuses only ask work-related questions to people aged 10+. It uses data data from the 1980, 1990 and 2010 Indonesian Census.

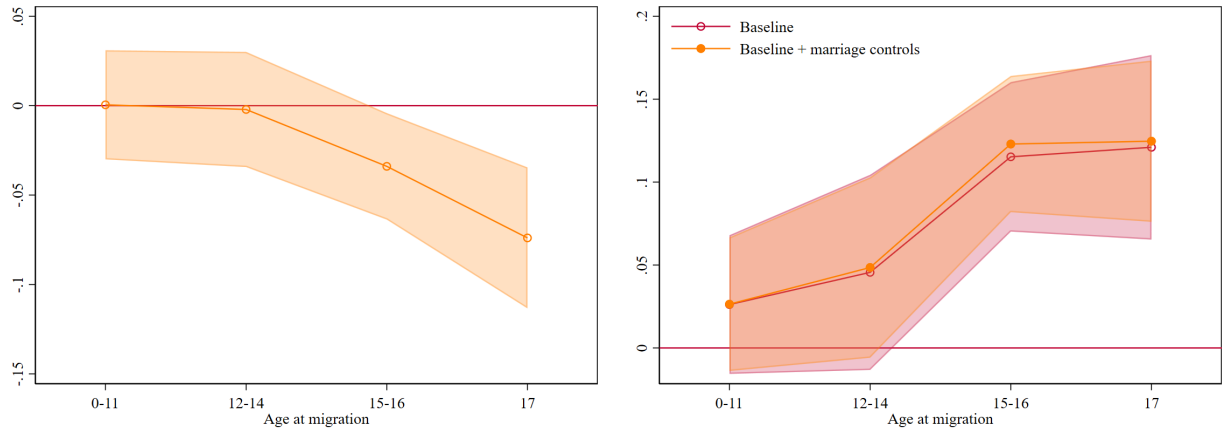
Figure B.14: Indonesia: birthplace effects controlling for female child labor rates by regency



Note: The figure shows estimates of the birthplace persistence coefficients by age of emigration $\boldsymbol{b_a}$ controlling for the female child labor rates (FCLR) at the birthplace. These FCLR values correspond to the regency's rate from the previous census year. The baseline regression controls for current regency-migration age-year fixed effects, a quadratic polynomial on age, and education level fixed-effects. Baseline + FCLR adds FCLR as a control, while Baseline + FCLR interactions adds interactions between migration age dummies and the regency's FCLR. The figure uses data data from the pooled 1985, 1995 and 2005 Intercensal surveys and sources birthplace FCLR from the 1980, 1990 and 2000 Indonesian censuses. The figure shows 90% confidence intervals.

Figure B.15: Work, migration age and marriage

(a) Marriage-related migration and birthplace FLFP (b) Employment controlling for marriage-related migration



Note: Uses data from IFLS. The regression controls for year, regency of residency, religion FE, education FE; , and a quadratic polynomial on age. Standard errors clustered by the regency of birth

C Data appendix

C.1 Cross-country data

I use harmonized data from IPUMS International to build Figure 1 from the introduction and Table 4. They show local employment rates for men and women aged 18-64 for a cross-section of countries. For all of them, I use the latest decennial census sample available. In most cases, this corresponds to 2010 or a year close to it.

I define employment using the harmonized employment status (`empstat`). When this variable is not available, I use the class of worker instead (`classwkr`). In these cases, I define a person as employed if they report being self-employed, a salaried worker, or an unpaid worker. In China, employed workers are those who reported working at least 1 day in the past week. Despite these slight definition differences, table A.9 shows that the employment rates I obtain are in line with the female labor force participation rates reported by the International Labor Organization and the World Bank (International Labour Organization, 2021).[33] The differences in the age ranges I consider drive the discrepancies for the United States, Vietnam, Thailand and China.

For all countries, I compute subnational employment rates at the lowest geographic unit available. For most countries, this corresponds to a geographic area akin to a district, a county, or a municipality. The only exception is the United States, where I compute these rates by commuting zone (Autor and Dorn, 2013). Table A.10 provides further details on the unit of aggregation and samples used. I winsorize the employment rates at the 5th and 95th percentiles by country. This reduces the possibility that very small regions drive the dispersion I observe within countries.

Figure 1 also includes information for India extracted from published tables from the Indian Census. Data for India is not available on IPUMS International. Thus, I extracted this information from tabulations of population and employment by district, sex and age from the 2011 Indian Census (Office of the Registrar General and Census Commissioner, 2011). I restrict the sample to people aged 15 to 59 and compute the share of people declaring to be main workers. Main workers are people who works at least six months a year.

C.2 Indonesian Family Life Survey

I use data from the Indonesian Family Life Survey (IFLS) to replicate my main results from the Intercensal Survey and to study potential mechanisms. The IFLS is a panel survey that tracks data from approximately forty thousand individuals across five waves and is representative of about 83% of the Indonesian population. In my analysis, I primarily use two survey modules: employment history, and migration.

I reconstruct the individuals' employment history using retrospective information from the

[33] The only exception is the Philippines, where the data from IPUMS International implies much lower employment rates. In my data, I obtain a female employment rate of 33% for women aged 18-64. The ILOSTAT database reports a female labor force participation rate of 48% for 15+ women in 2010. The gap between these two figures cannot be accounted for by female unemployment which is of the order of 4%. That said, I am interested in within-country dispersion, these discrepancies are second order as long data collection is consistent within the country.

employment history module. In each of the five waves of the IFLS (1993, 1997, 2000, 2007, and 2014), respondents were asked about their employment status, sector of employment, and other job characteristics for the survey year and each of the five prior years.[34] This allows me to construct a job-history panel tracking yearly employment status and job characteristics for each individual from 1988 to 2014.

I complement the job-history panel with information on birthplace and migration history. The IFLS provides data about the respondent's regency of birth, the regency of residence at age 12, and detailed information on every migration episode after age 12. This includes the year of the move and the destination regency, allowing me to reconstruct a yearly history of the regencies of residence for each respondent from age 12 onwards.

Similar to the Intercensal Survey, I define migration as a move across fixed-boundary regencies. I use the IPUMS regency boundary delineation to translate the IFLS regency codes into geographic units with fixed boundaries during 1970-2015. Although the IFLS tracks moves within the same regency, I do not treat them as migration in my analysis.

I determine the age of migration using birthplace and migration history data. For respondents who were still living in their birthplace at age 12, I compute the age of migration based on the year of their first move. Since the survey asks about "moves after you turned 12," I assign an age of 12 to those whose implied age of migration is below 12. For respondents whose location at age 12 differs from their birthplace, I only know that their first move occurred before they turned twelve.

For my main results, I keep observations where respondents were between 18 and 64 years old and lived outside their regency of birth. Most respondents migrated at most twice in their lives: 40% migrated once, while 33% migrated twice. Among those who migrated twice, 70% are return migrants, meaning they lived outside their birthplace regency for several years before returning. Consequently, for most individuals, my results reflect their work history in their new permanent residency or their history while living outside their birthplace.

Similar to the Intercensal Survey data, I bin the migration ages into four categories: 11 or less, 12 to 14, 15 to 16, and 17. This is because the number of migrants at early ages is small relative to the number of regencies. The first bin is unavoidable due to data limitations, while the next two bins were chosen so that migrant counts are roughly balanced across categories.

C.3 Data Traditional Cultural Practices

Data on traditional cultural practices comes from the Ethnographic Atlas (Murdock, 1967). I follow Bau (2021)'s procedure and match the Atlas' data on 45 ethnicities to the 2010 Indonesian Census using the main language spoken at home. I extract data on practices related to gender or marriage as define below:

- *Matrilocality*: newly-weds reside with bride's family after marriage.
- *Emphasis on female chastity*: there is insistence on female virginity.

[34] They were also asked about wages and hours of work. However, this information is not available for all waves.

- *Bride price*: upon marriage there's transfer of wealth to the bride's family.
- *Plow agriculture*: practiced plow agriculture. Ancestral use of plow is associated with less equal norms (Alesina et al., 2013).
- *Male agriculture*: agriculture is exclusively male.
- *Polygamy*

C.4 Aggregation of regencies

The total number of regencies varied considerably across years (Minnesota Population Center, 2023; Central Bureau of Statistics, 1980, 2010). In 1980 there were 286 regencies but by 2010 there were 493. To ensure a consistent definition of the local labor market across the years, I aggregated regencies into 269 geographic units with fixed boundaries between 1980 and 2010. I took the boundary definitions directly from IPUMS International (Minnesota Population Center, 2023).

For each survey, IPUMS provides a year-specific delineation for the regency of residency, the regency of birth, and a fixed-boundary definition for the regency current residence. In each survey, I use the mapping between then boundary-consistent and year-specific regencies of residency and apply it to the regency of birth to obtain the fixed-boundary regencies.

D The Empirical Strategy

D.1 Place and women's labor supply: the identification challenge

The place of residence can directly and indirectly affect women's labor supply. Direct effects influence the labor supply of all current female residents. There is considerable empirical evidence documenting these effects, which may arise from factors such as the availability of childcare (Compton and Pollak, 2014), commuting costs (Le Barbanchon et al., 2021; Farre and Ortega, 2021), the industry makeup of employment (Olivetti and Petrongolo, 2014), or the level of gender discrimination in the local labor market (Charles et al., 2023). Variations in these factors across localities can cause geographic differences in women's labor supply.

However, place can also affect women indirectly by shaping their preferences and skills. Women born and raised in locations where many women work may internalize these norms, making them more likely to work as adults (Charles et al., 2023; Boelmann et al., 2021). Additionally, environments with high female employment may encourage women to invest in the skills needed to participate in the labor market (Molina and Usui, 2022). These enduring indirect effects create differences in labor supply among women from different locations, *irrespective* of their current residence. Evidence on these indirect effects is much scarcer in the literature (Charles et al., 2023).

The omitted variable problem

In this paper, my main interest lies in determining whether, conditional on the current place of residence, women's birthplace has a persistent influence on their work choices in adulthood. More formally, let us consider the following model for the probability of employment e_{it} of a female migrant,

$$e_{it} = \omega_{c(i)t} + \boldsymbol{\sigma} p_{b(i)} + \eta_{it} \tag{D.1}$$

In this model, women's employment choices depend on three main factors. First, the place-of-residence fixed effect $\omega_{c(i)}$ captures all the direct effects of location c on female labor supply. These might include commuting costs, childcare availability, and gender discrimination. Second, the birthplace female employment $p_{b(i)}$ is intended to capture the causal effect of growing up in a location where $p_{b(i)}$ percent of the women work. Finally, the error term η_{it} captures all other factors making some female migrants more likely to work than others.

Model (D.1) follows closely the tradition brought forth by the "epidemiological" approach literature (Fernández and Fogli, 2006; Fernández et al., 2004; Fernández, 2013). Women's birthplace could have multiple impacts on women's behavior as adults. Including the prevailing female employment rates as the main regressor in equation (D.1) relies on the idea that these rates capture the place-driven factors vital in determining women's employment choices. Moreover, focusing on the exposure to the origin location, allows to isolate variation potentially driven by environmental factors –culture, institutions–, from variation driven by purely economics factors, such as wages, and income. This specification also facilitates testing whether alternative channels are driving the relationship with the birthplace employment rates (Fernández, 2013).

In model (D.1), $\boldsymbol{\sigma}$ captures the birthplace effects. It gives the counterfactual increase in women's employment if they had been born in a place with one p.p. higher FLFP. In the ideal, but unfeasible experiment, I would reassign women's birthplace randomly while keeping their family and the current residency fixed. Random assignment would guarantee that women's birthplace is uncorrelated with the error term. Thus an OLS regression of (D.1) would give a consistent estimate of $\boldsymbol{\sigma}$. In observational data, however, it is likely that the unobserved factors imbued in the error term are correlated with birthplace labor supply. Therefore, the OLS estimates of the FLFP slope will conflate the causal effects of birthplace with omitted variable bias:

$$\begin{aligned} \text{plim } \hat{\boldsymbol{\sigma}} &= \boldsymbol{\sigma} + \frac{\text{cov}(\tilde{p}_{b(i)}, \tilde{\eta}_{it})}{\text{var}\left(\tilde{p}_{b(i)}\right)} \\ &= \boldsymbol{\sigma} + \boldsymbol{\gamma} \end{aligned} \tag{D.2}$$

where tilde accents denote variables that are residualized from regency-year fixed effects (Angrist and Pischke, 2009). Expression (D.2) shows that the OLS coefficient reflects two factors: first, the causal effect of birthplace $\boldsymbol{\sigma}$, but also differences in unobservable characteristics across women from different origins $\boldsymbol{\gamma}$. The critical identification challenge is separating the selection term $\boldsymbol{\gamma}$ from the

birthplace effect $\boldsymbol{\sigma}$.

The selection term $\boldsymbol{\gamma}$ highlights that even in the absence of a causal effect, birthplace could capture characteristics about a person or their family that are relevant to their work decision. In the paper, I argue that the causal effect of place is positive ($\boldsymbol{\sigma} > 0$). That is, being born in a place where more women work, makes you more likely to work. In these circumstances, I am more concerned with omitted variable –or selection– bias making women from high-FLFP locations more likely to work than their low-employment counterparts. For example, previous research shows that connection to working mothers make women more likely to work (Fernández et al., 2004). Even in the absence of a causal effect, a positive $\hat{\boldsymbol{\sigma}}$ could simply be reflecting that, in places where more women work, girls are more likely to be connected to working mothers.

Using emigration age data to identify causal effects

Under additional assumptions, data on the age of emigration allows me to distinguish selection from the causal effect of place. The argument is similar to that of Chetty and Hendren (2018a). I assume that place effects are stronger the longer women stay there. Thus, the employment choice for women who emigrated at age a is determined as follows:

$$e_{it} \quad = \quad \omega_{c(i)at} + \boldsymbol{\sigma}_a p_b + \eta_{it} \tag{D.3}$$

Here $\boldsymbol{\sigma}_a$ captures the cumulative effect of birthplace up to age a[35]. The causal impact of staying in the birthplace at age a is then $\boldsymbol{\pi}_a = \boldsymbol{\sigma}_a - \boldsymbol{\sigma}_{a-1}$.

By an argument analogous to that in expression (D.2), the OLS estimates will conflate the causal effects of birthplace $\boldsymbol{\sigma}_a$ with the omitted variable bias for women migrating at age a $\boldsymbol{\gamma_a}$:

$$\text{plim } \hat{\boldsymbol{\sigma}}_a \quad = \quad \boldsymbol{\sigma}_a + \boldsymbol{\gamma}_a \tag{D.4}$$

Assumption 1. ***Constant omitted variable bias***
Omitted variable is the same no matter the age of emigration, that is $\boldsymbol{\gamma}_a = \boldsymbol{\gamma}$

This assumption requires that, conditional on the location-year-age fixed effects, the correlation between the birthplace employment rate and the error term is the same for women who emigrated at different ages. To make this point more concrete, let us consider work-related migration as an example. It is conceivable that women who migrated with work in mind would be more likely to be employed in their destination, and women in their 20s would be more likely to migrate because of work than 12 year old women. At first glance, this would seem to invalidate the identification strategy. However, my strategy does not require that women migrating at different ages have the same likelihood of migrating for work. Rather, it requires a much weaker condition: that the correlation between birthplace FLFP and the likelihood of work migration is the same for women

[35]The causal effect $\boldsymbol{\sigma}$ in the previous subsection can be interpreted as a weighted average of age-specific causal effects.

migrating at different ages. Therefore, even though older teenagers are more likely to migrate for work, this does not necessarily violate the identification assumption.

Under the constant omitted variable bias assumption, I can isolate the birthplace causal effect from the omitted variable bias. By subtracting the OLS estimates of the slopes of different migration ages, the constant selection term $\boldsymbol{\gamma}$ goes away, leaving only the causal effects:

$$\begin{aligned} \text{plim } \hat{\boldsymbol{\sigma}}_{\boldsymbol{a}} - \hat{\boldsymbol{\sigma}}_{\boldsymbol{a-1}} &= \boldsymbol{\sigma}_a - \boldsymbol{\sigma}_{a-1} \\ &= \boldsymbol{\pi}_a \end{aligned} \tag{D.5}$$

this expression also shows that identification does not necessarily require constant bias across all *all* emigration ages. If, instead, bias is constant only within some age ranges, I can still identify the effects within those ranges. For example, suppose there is reason to believe that the bias for women who emigrated between 0 to 6 years old is different than for those who emigrated between the ages of 7 to 15. If constant selection holds *within* these ranges, I can still identify the place effects within the 0 to 6 and 7 to 15 ranges respectively.