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EL ROL DE LOS ESTUDIOS DE POBLACIÓN TRAS LA PANDEMIA DE COVID-19 Y EL DESAFÍO DE LA IGUALDAD EN AMÉRICA LATINA Y EL CARIBE

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Disparities in Gender Preference and Fertility: Southeast Asia and South America in a Comparative Perspective

EXTENDED ABSTRACT

Abstract

Preference for sons and sex selection against females is widespread in vast regions of the world, including a great number of Asian and East European countries. However, while robust son-bias has been widely studied in several countries of these regions, much less attention has been given to other regions, such as Latin America. The aim of this paper is to compare the intensity of gender preference in selected countries of Southeast Asia (Cambodia, Indonesia, Laos, Malaysia, Thailand and Vietnam) and Latin America (Argentina, Brazil, Colombia, Ecuador, Mexico and Uruguay) at the beginning of the 21st century by calculating to what extent parents adapt their fertility behavior to ensure the birth of preferred sex. Using census data from Integrated Public Use Microdata Series-International (IPUMS-I) derived from the 2010 round, we compute Parity Progression Ratios. Our results show a relatively uniform pattern for Latin American countries, with a widespread preference for a mixed composition of children. Son preference is visible only in a few cases, and it is slightly noticeable in some others. Instead, a mixed composition of children is the most widespread preference

1. Introduction

Preference for children of a certain sex is commonly widespread in several Asian and East European countries[1]. Most usually, preference for sons, which fosters sex selection against females. At the population level, some sex-selection behaviors can lead to skewed sex ratios at birth, which has adverse consequences in the long run, as seen in the Chinese, Indian and Korean cases –few potential partners for men and an increased likelihood of coerced marriages or other kinds of violence against women (Attané, 2006 ; Bongaarts, 2013; Guilmoto, 2015). Thus, the masculinization of sex ratios at birth has been seen as a general concern in countries where son preference predominates, particularly where it is more dramatically linked to poorer health, less schooling and higher mortality for girls.

In fact, when Sen (1990). famously estimated that there were more than 100 million "missing women", the focus was precisely on female neglect –gender discrimination in access to nutrition and health care–, resulting in higher female mortality. Now, there are 1.7 million missing female births in 2015 alone, mostly in Asian countries (Bongaarts & Guilmoto, 2015). Prenatal sex selection might be replacing postnatal discrimination against women, even when both occur in several countries such as India or China. While sex selection has been widely studied in these regions, much less attention has been given to other regions, such as Latin America, although Latin American fertility has been widely studied in many dimensions, including fertility intentions, socioeconomic differentials, family systems, deceleration of progression to higher parities and emerging nullparity preferences.

The aim of this paper is to compare the intensity of gender preference in selected countries of Southeast Asia (Cambodia, Indonesia, Laos, Malaysia, Vietnam, Thailand and Vietnam) with selected countries of Latin America (Argentina, Brazil, Colombia, Ecuador, Mexico and Uruguay) at the beginning of the 21st century by calculating to what extent parents adapt their fertility behavior to ensure the birth of preferred sex.

Prenatal sex selection not only includes sex selective abortions, but also differential stopping behavior, one of the main mechanisms that couples are still using to select the sex composition of their offspring. Some explanations have focused on the persistance of gender inequality despite the improvements in women's socioeconomic condition (Kumar & Sinha, 2018). Also, economic development and fertility decline, two intertwined trends observed on those two regions, are likely to affect average family sizes and, accordingly, the level of sex selection ("fertility squeeze effect") (Guilmoto, 2009).

In comparing Southeast Asian and Latin American, this paper provides an up-to-date picture of fertility behavior in those regions of the world and offer an opportunity to test the hypothesis of preference for sons. This study will speak to concerns around gender inequality and enable us to contribute to debates around fertility in the Global South and the links between these two regions.

[1] Sex preference for children has been measured in some African countries as well, but prenatal sex selection has not emerged yet.

2. Sex preference. Trends and demographic consequences

2.1. Son preference around the world

Evidence on sex preference around the world is extensive but focused on regions and countries where son preference tends to be prominent. Those are mostly countries from a band stretching from North Africa (Morocco, Tunisia, and Egypt), through the Near East, Central Europe and Caucasus (Albania, Azerbaijan, Armenia, Georgia), to South Asia (India, Bangladesh, Nepal) and East Asia (China, South Korea, Vietnam) (Arnold, 1991; Brunson, 2010; Calhoun, 2013 ; Chung & Gupta, 2007; Hatlebakk, 2012; Haughton & Haughton, 1995; Murphy, 2011; Rai et al., 2014).

Some of the clearest cases of son preferences in the world are India, Bangladesh, Egypt, and Nepal (Brunson, 2010; Hatlebakk, 2012; Rai et al., 2014). Rossi & Rouanet (2015a) have shown that in North Africa, a strong son preference not only persisted but increased over time. In sub-Saharan Africa, son preference prevails in about two-thirds of the countries.

Instead, previous research shows a very slight preference for women in some Latin American countries like Colombia or the Dominican Republic (Arnold, 1997) and also in some Caribbean countries. Since the 1990s, many countries where son preference used to prevail, changed to more indifferent sex preferences, as Lin (2009) shows for Taiwan. In other cases, as in India, "historical son-preference has continued unabated into the modern era" (Bhalla, 2013: 13).

Anderson et al (2007) argue that countries with higher gender equality might show no sex preferences. In Europe, when there is any preference at the country level, it is usually for a mixed-sex composition of children. However, data for Nordic countries do not support the sex indifference hypothesis and show new sex preferences instead –a mixed composition is preferred in two-children couples, but for third births, there is a slight preference for girls in Denmark (also in Jacobsen et al (1999)), Sweden and Norway and a slight preference for boys in Finland. Hank & Kolher (2000) similarly found girl preference in the Czech Republic, Lithuania, and Portugal. All these trends can change quite rapidly. For instance, in parts of Germany, preference for sons and preference for girls have been detected in different decades (Brockmann, 1999).

Sex preference is derived from the actual composition of births[2], but attitudinal sex preference is also part of the research agenda. Fuse (2010) studied it in 40 countries, concluding that while the most popular type of preference in most countries is a mixed-sex composition, the prevalence of son and daughter preferences can vary heavily across countries and regions. Her results confirm that attitudinal daughter preference can be found in some Latin American countries and Southeast Asian countries, while son preference is prevalent in Southern Asia, Western Asia, and Northern Africa.

In any case, attitudinal sex preference might translate into reproductive behavior –when couples have the means to stop subsequent births or practice sex-selective abortion–, or not. When it does, it is relevant to observe which behavior is used to implement selection. Altindag (2016) points out that son-biased differential stopping behavior tends to be more common in Central Asia (Filmer, 2009) and North Africa (Basu, 2010) while

[2] Some authors also link gender preferences to differential birth spacin (Rossi, 2015b).

in other countries (China, India, South Korea) this behavior coexists with sex-selective abortions.

Sex preferences are embedded in cultural traditions and norms. Although they do not emerge from a single set of historical and cultural experiences (Arnold, 1997), son preference tends to be the norm in traditional family systems. Having a son is an investment, considering patrilineal and patrilocal rules and inheritance patterns, reproduction of the lineage, and how they may act as old age insurance for parents in a sort of primitive social security system, given that they are supposed to remain in the house. Sons also tend to be more valuable on the farm or in any family business, and provide adittional household help from the daughter in law or from dowry payments (Bhalla, 2013; Rai et al., 2014). Modernization and socioeconomic development is expected to change most of these structures, as in modern societies, children are not a source of resources, but are instead valued for social and psychological reasons. In that context, subtler reasons emerge, and sex preferences might change. For instance, each partner might prefer to have at least one child of his or her sex for the purpose of companionship (Jacobsen, 1999)[3].

Nowadays, sex ratio at birth has returned to normal values in South Korea, since its peak of 115 in the 1990s, and it is decreasing in countries of the South Caucasus, since their peak values at the end of the century –117 in Azerbaijan in 2002, 119 in Georgia in 1998, and 116 in Armenia in 2001– (Guilmoto, 2009). However it is stabilizing at a high value in China and in Vietnam (Becquet & Guilmoto, 2018) and it is worsening in other countries, such as India (Aksan, 2019). The stylized model that may be behind these trends is a "sex ratio transition", whereby son preference declines through the fertility transition, and both Sex Ratio at Birth (SRB) and Sex Ratio at Last Birth (SRLB) first increases and then gets back to natural levels, as population dynamics become post-transitional (Bongaarts, 2013). This model may be used as a hypothesis. The pace of this transition depends on the counterbalance between son preference and average family size.

2.2. Demographic and social consequences of sex preferences

These preferences have demographic consequences at the population level. For instance, preference for a mixed-sex composition tends to increase fertility. Kippen et al (2007) estimate that it added 3% to the fertility of Australian cohorts. Parents looking for one or more children of a given sex may have more offspring than previously intended ("the desire for a son is the father of many daughters" (Seidl, 1995). In fact, in any population with some sex preferences, reproductive decision-making might be affected, impacting on reproductive behaviors. In countries with strong son preference, there is a higher prevalence of contraception after the birth of a son than after the birth of a daughter (Arnold, 1997)[4].

Son preference can also alter the SRB, but this happens when sex-selective abortion is one of the gender preference mechanisms, not when preference is implemented exclusively by male-biased differential-stopping behavior (Altindag, 2016). So, sex selection can be measured by SRLB: the proportion of last births that are boys can be quite higher than the expected 0.51.

[3] Specific historical contexts matter as well. Hank & Kohler (2000) mention studies in the United States –during the Vietnam war– and in Israel, suggesting that in times of military crisis, a slight preference towards daughters emerges, since parents want to avoid losing a son in combat.
[4] Mortality also plays a role, as son preference means having one (or more) surviving sons.

Sex selection can produce impressive male-skewed SRB, as in the case of South Korea in the 1990s: 196 in third-births and 229 in fourth births. Nowadays, the world's sex ratio at birth is 107 boys for 100 girls, and the highest sex ratio at birth can be found in Vietnam (112.3 in 2015-2020), Azerbaijan (112.5 in 2015-2020) and China (113 in 2015-2020) (United Nations, 2019). As Bongaarts (2013) recalls, for most of human history, the SRB was never above the natural level –around 105 boys per 100 girls. This continued to be the case even during much of the fertility transition in countries with strong son preference. Quite recently, sex ratios at birth have increased, mostly in Asia –due to access to ultrasonography, allowing couples to know the sex of the fetus, and fertility decline, decreasing the probability to have a son.

In any case, differential stopping has other consequences, mostly at the household level, as daughters may grow up with more siblings than sons and are born earlier than their male siblings. Basu & De Jong (2004) notice both this *sibling effect* and *birth-order effect* in many countries in South Asia, Southeast Asia, and North Africa. The former can make girls face more competition for family resources (Rossi, 2015b), while the latter can be also detrimental to girls, as parents might delegate the care of younger children to the older children in the household Basu & De Jong (2004).

2.3. Sex preference and fertility decline. The "fertility squeeze" effect

Economic development and female education might reduce son preference, but it might also worsen sex ratio at birth at the same time, via a reduced desired and actual family size. With a decreasing family size, the influence of the sex composition of previous children on fertility behavior should increase (Jayachandran, 2014; Wood, 1977), through the so-called *fertility squeeze effect* (Guilmoto, 2009).

Let us imagine a couple that desires to have at least one son. Their probability of remaining sonless –if it is left to chance– decrease exponentially with fewer children, so they might feel a big incentive to revert to sex selection at low birth orders. If a couple wants to have at least one son, it is very unlike to fail if they have 4 or 5 children. But there is a 24% chance if they have two children. Data support this hypothesis, i.e., fertility decline can explain roughly half of the increase in the sex ratio at birth in India (Jayachandran, 2014).

Then, sex ratio bias becomes increasingly hyper-sensitive to fertility changes -attitudinal son preference might be reduced while a worse sex ratio at last birth might arise at the same time. In fact, this is the case for India, in 1991-2006 (Bongaarts, 2013), visible through its geographic heterogeneity in sex selection at second- and third-order births (Aksan, 2019). In fact, this may be the reason why women's education and job opportunities have played a smaller role in the fertility decline in India than in other Asian countries (Aksan, 2019; Dharmalingam, Rajan, & Morgan, 2014)[5]. The phenomenon is also visible though the link between fertility squeeze and sex preference in the context of China's *one-child policy* (Yang, 2012). The pace of this change depends on a rapid diffusion of prenatal sex determination technology combined with small but growing propensities to abort at low birth parities (Dubuc & Sivia, 2018).

Fertility decline comes along a much stronger fertility control. Parents become more effective in achieving their reproductive goals, which might include having at least one son, having children of both sexes or any other preference regarding the sex composition of their children. More specifically, wider availability of technology for implementing sex

[5] Also in India, fertility decline may explain one third to one half of India's recent sex ratio at birth increase (Jayachandran, 2017).

selective abortions, strong son preference and fertility decline might raise the SRB, while factors as laws banning prenatal sex selection or limiting access to abortion can decrease it (Bongaarts, 2013). Bhalla, Kaur, & Agrawal (2013) make a more nuanced point with data from India, stating that there is no monotonic relationship between sex ratio at birth and fertility decline, but a sort of zig-zag pattern. When parity reaches odd figures the sex ratio at birth worsens (5, 3, 1) and it improves when reaching even fertility levels (4, 2).

In sum, the lower the average family size, the less number of interventions is needed to distort ratios at the population level, in a "disproportionality" effect that applies synergistically with the *fertility squeeze* effect (Sivia, 2017). Through a simulation approach, Kashyap, & Villavicencio (2016) show that sex ratio at birth distortions can emerge even with low levels of son preference (just 20%-30% wanting at least one son), given that many mechanisms of sex selection intervene (fertility decline, sex preference and diffusion of technology for sex selective abortions). Considering this effect, recent fertility decline in Latin America and Southeast Asia make it relevant to observe sex selection in both regional contexts.

3. Fertility decline in Latin America and Southeast Asia

3.1. Fertility decline in Latin America

In the last 50 years, fertility has declined very rapidly in Latin America. In 1970, TFR was around 5 children per woman. In the latest available data, fertility is near replacement level, and few countries in the region have fertility below replacement. Although TFR levels are still considerably heterogeneous, the rest of the countries are rapidly converging, mostly through better access to contraception and parity-specific stopping behavior. After a very steep decline in Central American countries since the 1990s, almost every country in the region has TFR below 3 children per woman. Latin America is now one of the low fertility regions in the world.

However, fertility decline in Latin America does not follow the same pattern as in the countries that led this process. The emergent Latin American low fertility regimen is characterized by the decoupling of the rate of decline of adolescent fertility in relation to total fertility decline. Adolescent and early fertility rates remain high, in a low fertility setting (Cabella & Pardo, 2014; Rodríguez Vignoli & Cavenaghi, 2014). Latin American fertility is also characterized by a high number of unplanned pregnancies and a high proportion of children born to consensual unions, an expected result of the Latin American "cohabitation boom" (Esteve, Lesthaeghen, & López-Gay, 2012). Considering that adolescent fertility and poverty (absolute and relative) are strongly associated in all Latin American countries, social inequalities explain most of its unusual trends in reproductive behavior, although not at the same extent in all countries (Sacco & Borges, 2018).

The persistence of a pattern of early reproduction coexists with the onset of postponement, which is concentrated among women in the higher educational levels (Rosero-Bixby, Castro-Martin, & Martín-García, 2009). This highly heterogeneous reproductive behavior is reflected in polarization in age at first child, giving place to a peculiar "bimodal pattern" (Lima, 2017; Pardo & Cabella, 2018), at least in the Southern Cone of the region. It also perpetuates a gap between desired and effective fertility, as people from low socioeconomic levels have higher and earlier fertility than the rest and a higher proportion of unwanted pregnancies, while women from other status tend to have fewer children than desired. In the most recent data, adolescent fertility (15-19) and early fertility (20-24) started to fall at faster rates, as also expected by United Nations projections (Cabella & Nathan, 2018). If this trend continues, reproductive behavior will

be less unequal, mean age at first birth will be later, and low fertility levels will be consolidated. In any case, the Latin American pattern would continue to be a peculiar case of low fertility regimen, making for an unusual demographic context in which behaviors such as sex preference might take place.

4. Data and Methods

PPRs were calculated according to the sex of the previous children, based on the hypothesis that parents that have a preference for sons have a greater probability of having an additional child if they do not have a son or enough sons yet. This method models fertility behaviors and allows the measure of what (Rahman, 1993) call "manifested son preference," following the idea that the desire to have additional children is likely to decrease when the sex composition of children already born is consistent with the preferences of the parents (Hank & Kohler, 2003). The method has been used earlier by Haughton and Haughton (1995) and Guilmoto (2012) to explore regional disparities of the absence of a male child in Vietnam, but this research did not examine the sex composition of siblings in detail, nor individual variations.

PPRs were calculated based on cohorts of children. To that end, applying the technique described by Guilmoto (2017) and based on the own-children method, we reconstructed a population of siblings using their relation to the household head to classify them. Following the model of synthetic parity progression ratios, these cohorts were classified by parity instead of cohort (Wunsch, 2006). We used the Kaplan-Meier estimator to measure the cumulative proportion of children who had a younger sibling before 2010, since our sample is right-censored by the census date. We also used Cox regressions to compare distinct effects of several characteristics.

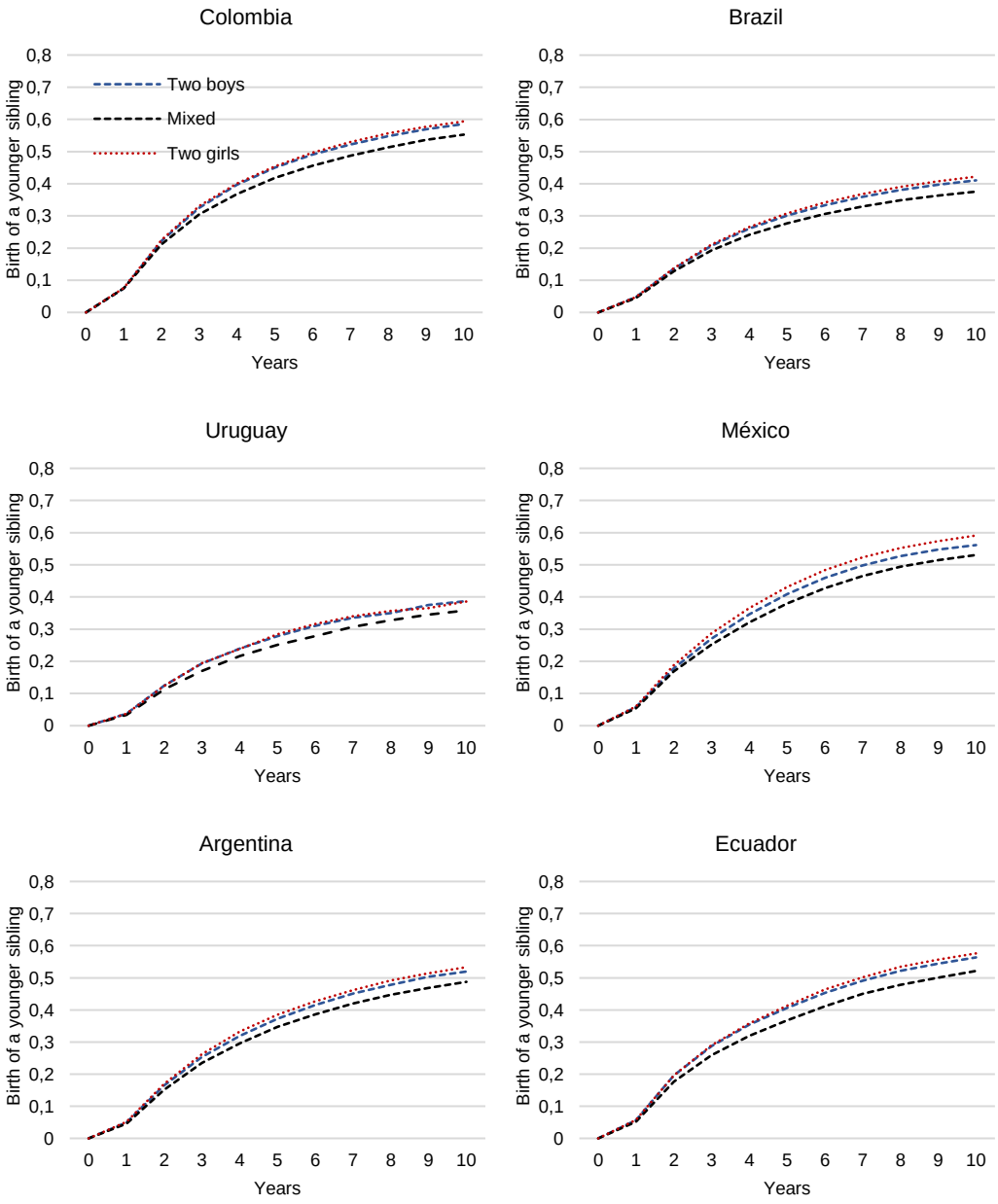
5. Results

5.1. Gender preference in Latin America

Our results show a relatively uniform pattern for Latin American countries, with a widespread preference for a mixed composition of children. This is clearly noticeable in the probability to have a third child, shown in Kaplan-Meier curves for each country (Fi). The daughter preference hypothesis stated by Arnold (1997) for some Latin American countries does not hold in the countries of our sample. Instead, son preference is detected in a few cases, but lags behind the preference for a mixed composition.

That is the case of Mexico, where there is a higher probability of having a third child when the first two are two boys or two girls (vs. gender-mixed), but the probability is higher when the two children are girls (vs. two boys). In Argentina, Brazil, Colombia, Ecuador and Uruguay, this also holds, but the difference is bearly noticeable.

Figure 1. Probability to have a third child by country, Latin America (selected countries)



Source: IPUMS-I.

Considering these figures, it seems like preference for a mixed composition is the norm in most Latin American countries, and son preference is null or almost imperceptible, except for Mexico. However, one specific fertility behavior might show son preference. The probability to have a fourth child, by gender composition of children (Figure 3) is indicative of a relatively widespread son preference in México, Argentina, Uruguay and Ecuador. Nevertheless, this finding is relevant but limited to a small portion of the population -those who have at least four children.

Cox Models make it possible to observe sex preference for the third child, once control variables are included. Those control variables predictably show a higher propbablity of having a third child for rural contexts and indigenous and low-educated parents (Table

1Table 1). Our conclusions hold. A mixed-sex composition is preffered in two-children couples, and odds ratios of having a third child for two-boys couples tend to be slightly higher than those for two-girls couples. These difference (HR=1.12 vs 1.10 in Colombia; 1.15 vs 1.12 in Brazil) is very slight everywhere but in Mexico, where a more noticeable son preference is visible, although beyond a mixed composition, when compared to a potential daughter preference (HR=1.18 vs. 1.09).

Table 1. Probability of having a third child (Cox model, Hazard Ratios) by sex composition of prevoius children and control variables. Latin America (selected countries)

Country	Argentina	Brazil	Colombia	Ecuador	México	Uruguay
Sex composition of previous children						
Mixed (*Ref.*)	1	1	1	1	1	1
Two boys	**1.09*** **	**1.12*** **	**1.10*** **	**1.13*** **	**1.09*** **	**1.11***
Two girls	**1.13*** **	**1.15*** **	**1.12*** **	**1.16*** **	**1.18*** **	**1.08**
Control variables						
Residence area						
Rural (*Ref.*)	/	1.00	1.00	1.00	1.00	/
Urban	/	0.81***	0.84***	0.87***	0.84***	/
Parent's characteristics						
Educ att mother	/	0.77***	0.78***	0.81***	0.84***	0.79***
Educ att father	/	0.86***	0.89***	0.88***	0.91***	0.82***
Indigenous mother	/	1.59***	1.30***	1.24***	1.10***	/
Indigenous father	/	1.47***	1.04	1.15**	1.08***	/
Observations	168,207	709,801	160,047	60,724	511,128	9,899
Log likelihood	-670030.78	-2539262.80	-773945.69	-245924.53	-2545422.70	-21596.50

Source: IPUMS-I.
Note: Children aged 0 to 10.
Results are expressed in hazard ratios.
*** significant at the 0.0005 level ** significant at the 0.005 level * significant at the 0.05 level
Ref. = reference category.

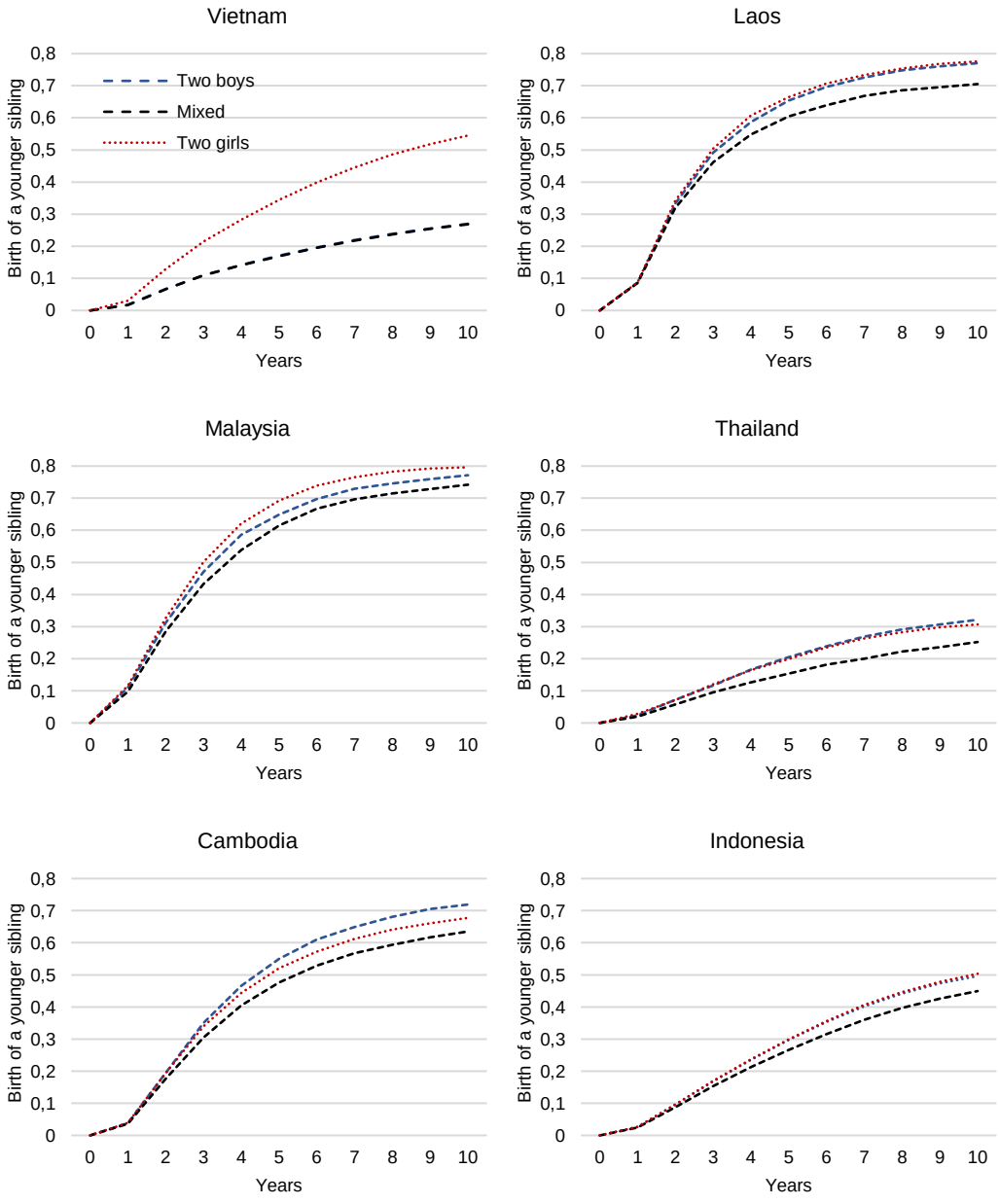
Computing hazard ratios for progression to second, third and fourth births by sex composition of previous children, provides a comprehensive look at sex selection in Latin America. Progression to the third and fourth child confirms results already shown through similar methods, and progression to the second child has no significant relation with the sex of the first, in almost every country. When it does (Mexico, Brazil, Uruguay), it is significant at the lowest level Figure 3.

In sum, the most usual behavior in the Latin American countries of our sample is gender indifference when progressing to the second child, and preference for a mixed composition when deciding whether or not having a third and fourth one. Daughter preference was not detected, and son preference can slightly increase the probability of a third or fourth birth if two-girls couples are compared to tow-boys couples. All these behaviors considered, the SRLB is not distorted, as expected (Figure 4).

5.2. Gender preference in Southeast Asia

(to be extended)

Figure 2. Probability to have a third child by country, Southeast Asia (selected countries)



Source: IPUMS-I.

Table 2. Probability of having a third child (Cox model, Hazard Ratios) by sex composition of prevoius children and control variables, Southeast Asia (selected countries)

Country	Cambodia	Indonesia	Laos	Malaysia	Thailand	Vietnam
Sex composition of previous children						
Mixed (*Ref.*)	1	1	1	1	1	1
Two boys	**1.22*** **	**1.14*** **	**1.11*** **	**1.06** **	**1.36*** **	**1.01**
Two girls	**1.13*** **	**1.15*** **	**1.15*** **	**1.16*** **	**1.30*** **	**2.33*** **
Control variables						
Residence area						
Rural (*Ref.*)	1.00	1.00	1.00	1.00	1.00	1.00
Urban	0.81***	0.89***	0.72***	0.88***	0.96	0.72***
Parent's characteristics						
Educ att mother	0.82***	1.02***	0.76***	1.06***	1.04	0.59***
Educ att father	0.91***	1.04***	0.89***	0.99	0.99	0.74***
Indigenous mother	/	/	/	/	/	/
Indigenous father	/	/	/	/	/	/
Observations	59,894	1,277,593	26,895	21,489	25,76	742,509
Log likelihood	-291987.60	-5000651.40	-150330.39	-119116.42	-44581.52	-1983134.30

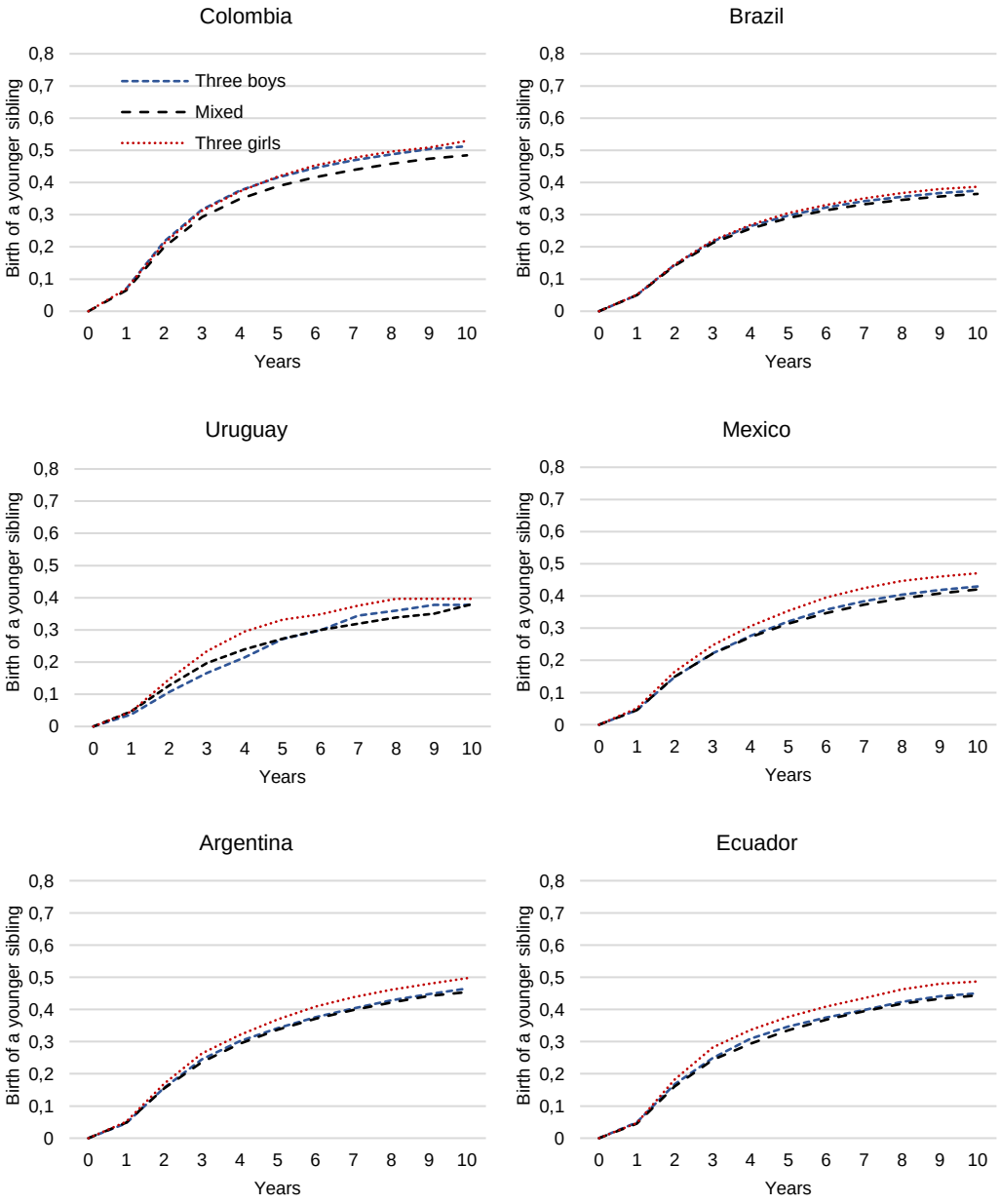
Source: IPUMS-I.
Note: Children aged 0 to 10.
Results are expressed in hazard ratios.
*** significant at the 0.0005 level ** significant at the 0.005 level * significant at the 0.05 level
Ref. = reference category.

6. Discussion

(*to be extended*)

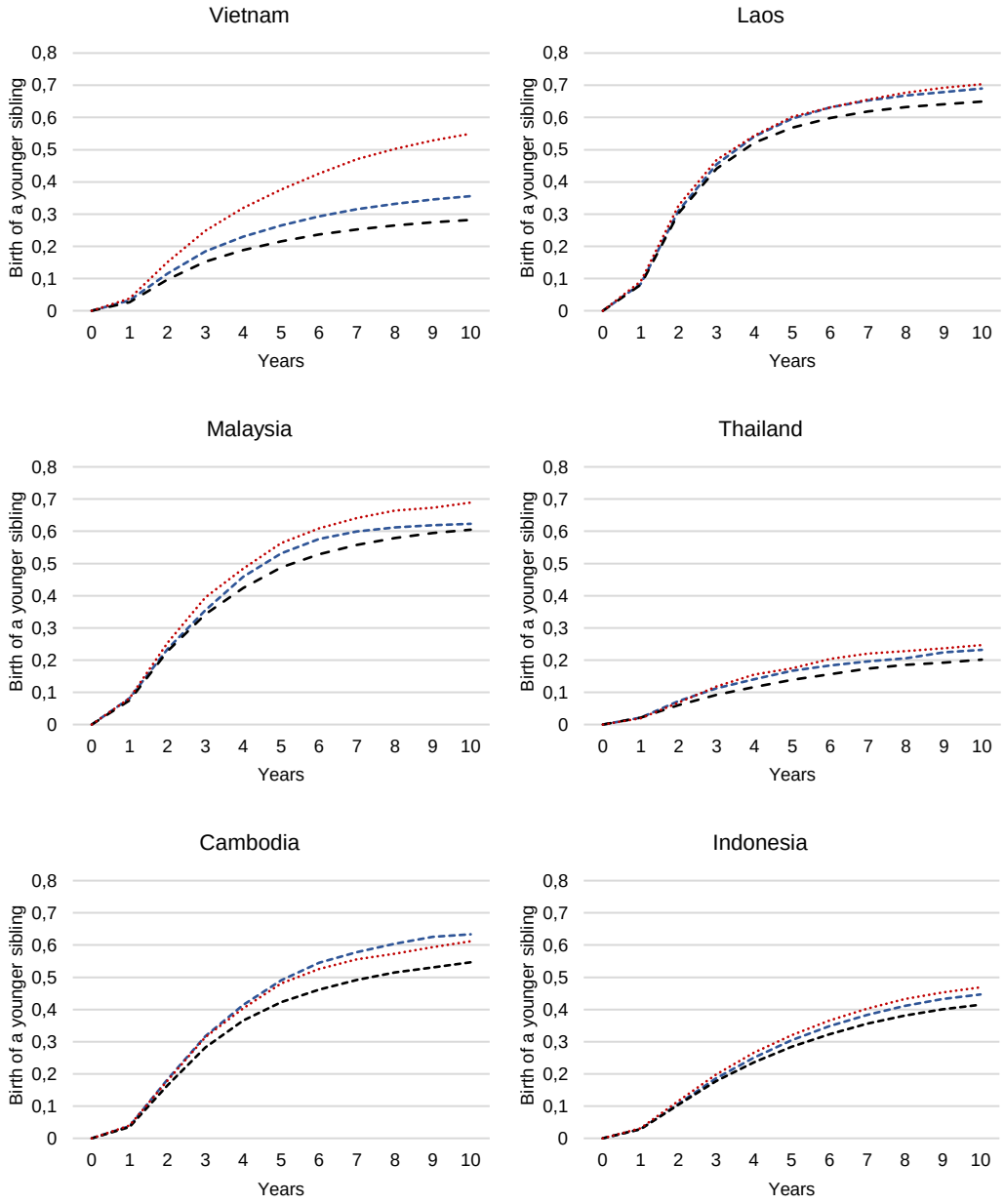
7. Annex

Figure 3. Probability to have a fourth child by country, Latin America (selected countries)



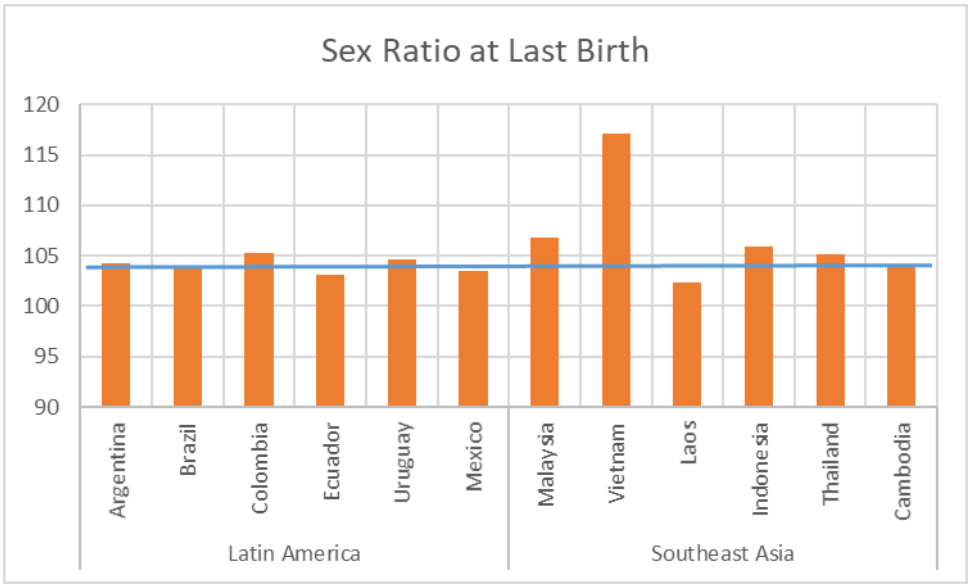
Source: IPUMS-I.

Figure 4. Probability to have a fourht child by country, Southeast Asia (selected countries)



Source: IPUMS-I.

A.3. Sex Ratio at Last Birth



Source: IPUMS-I.

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