How Do Demographic Trends Change? The Onset of Birth Masculinization in Albania, Georgia, and Vietnam 1990–2005

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THE THEORY OF DEMOGRAPHIC transition assumes the gradual move from a pre-transitional equilibrium of birth and death rates to a new equilibrium corresponding to lower vital rates. While this model remains largely correct, research on more than two centuries of demographic change has pointed to a significant number of variants and departures from the model. For instance, the secular decline in vital rates was often preceded by a short-term rise, starting from different high-fertility levels (Dyson and Murphy 1985), and was at times followed by unexpected stalls and rebounds as in postwar Europe (Van Bavel and Reher 2013), Southeast Asia (Hull 2012), sub-Saharan Africa (Shapiro and Gebreselassie 2013), and Central Asia (Spoorenberg 2015).

In comparison, the sex ratio at birth (SRB) has remained stable over centuries, oscillating around 104–106 male births per 100 female births since it was first measured in sixteenth-century England (Fellman 2015). The variations in birth masculinity by 1 or 2 percentage points, due to random fluctuations or to lesser-known biological or compositional factors, are mostly inconsequential.[1] Only in a few countries in Asia and Eastern Europe has a significant rise in birth masculinity emerged since the 1980s as people increasingly resorted to prenatal sex selection. In two of the countries we study here, Albania and Vietnam, SRB levels have risen above 110 or 115 over the last three decades, leading to a long-term process of demographic masculinization. In some countries, the SRB stabilized at a plateau level while in others, such as South Korea, it has returned to a normal level (Guilmoto 2009).

The increase of birth masculinity in some countries appears therefore to be recent and well documented by census and birth registration

series. Yet, changes in the SRB are imperfectly understood and its future course difficult to predict. The basic issue of the onset of birth masculinization remains unclear, with two lingering questions: When did the sex ratio at birth start departing from natural levels, and what factors or events set the change in motion? As argued by Van Bavel and Reher (2013) in the context of the baby boom in the United States, it is crucial to identify the date of onset before examining its contextual factors. Unlike the onset of the fertility transition—commonly identified as the period when total fertility rates (TFR) fall permanently by more than 10 percent—there is no recognized threshold for spotting a rise in the SRB. However, examination of yearly trends in East Asian and Eastern European countries suggests that once destabilized, the SRB tends to increase steadily until it reaches a new equilibrium level, usually in the range of 110–125 male births per 100 female births. Since there is indeed a beginning to the observed rise, it would be informative to explore its potential determinants. The overall impact of a late or early onset of birth masculinization is not without consequences. For instance, had Vietnam's sex ratio at birth started to rise ten years earlier—a perfectly feasible event in view of its low fertility and entrenched son preference—the country would today have 600,000 more males.[2]

We may regard the rise in SRB as an adaptive response to changes in structural factors such as gender bias, normative fertility, and available reproductive technologies, principally fetal sex determination and abortion. As couples adjust their reproductive behavior to a new environment, we then expect an almost imperceptible increase in birth masculinity generated by the gradual change in the causal factors. What we document in this article, by contrast, is a more abrupt rise in sex-selective abortions that can be clearly dated. In addition to structural factors, the onset of the rise is therefore likely to have been sparked by factors that precipitated a transformation in reproductive practices—a scenario closer to the case of initial outbreaks followed by a gradual diffusion. This debate on the causal mechanisms behind changes in demographic trends mirrors the discussion on the ultimate and intervening factors at the core of shifts in other demographic behaviors such as economic migration or fertility decline. In the case of the former, sustained migration may be ultimately caused by economic inequality, while the establishment of successful migratory networks represents a common intervening factor facilitating migration. As for fertility decline, the question about the respective role of demand and supply factors versus diffusion mechanisms in explaining a sustained decrease in birth rates remains a matter of discussion. The case of the skewed sex ratio at birth presented in this study provides new materials on the historical determinants of demographic change. It focuses on the relatively recent cases of SRB rise in Albania, Georgia, and Vietnam. Apart from the rich data they provide, these three countries were chosen for the distinct political, socioeconomic,

and cultural contexts they offer for analyzing instances of sudden increase in birth masculinity.[3]

Explaining the masculinization of births

Today there are more than a dozen countries with elevated sex ratios at birth due to prenatal sex selection and many more where sex selection is practiced only by a minority of the population. According to official estimates, Azerbaijan, Armenia, and China record the highest levels of birth masculinity, but skewed SRB levels are observed in several other countries in Eastern Europe, South Asia, and Southeast Asia.[4] While each country is characterized by a specific contextual setting, such as the prevalence of dowry in India or the former one-child policy in China, the presence of prenatal sex selection can be linked to the existence of three concurring preconditions (Guilmoto 2009). The first condition is a strong preference for sons. Along with this demand factor, there is a corresponding supply factor: the emergence of affordable reproductive technologies allowing, in particular, parents to detect the sex of children during pregnancy and abort fetuses of the unwanted sex. Also at the root of skewed sex ratios at birth is a low TFR. Low fertility acts as a severe constraint to the reproductive goals of parents; for example, more than 23 percent of parents with two children would remain sonless in the absence of sex selection.

This explanatory framework suggests that the initial rise in the SRB would proceed from changes in initial conditions such as lower fertility, stronger gender bias, or greater access to sex-selective abortion. Interestingly, son preference, the core factor in our model, may not have changed significantly in the expected direction since the 1970s. The preference for sons is ultimately rooted in patrilineal and patrilocal kinship systems that favor sons for various socioeconomic or ritual purposes (Croll 2000). There is no instance of suddenly intensifying son preference that could lead to a rise in birth masculinity. The overall trend is rather one of loosening kinship constraints and increasing female autonomy through improved access to education and employment among younger cohorts of women. When measured by surveys, the preference for sons tends in fact to decrease over time—even when sex selection itself become more widespread (Kashyap and Villavicencio 2016). At first sight, increased gender bias may not be a plausible explanation for the rise in the SRB observed since the 1980s.

The other two preconditions of prenatal sex selection may offer stronger grounds for explaining changes in birth masculinity trends. Reproductive choice has clearly expanded over the last 50 years in relation to gender preferences. Contraception has, for instance, allowed parents to avoid the birth of additional children after reaching the desired sex composition, leading notably to a vast majority of boys among last-born

children in son-preferring settings (Bongaarts 2013). Prenatal sex testing emerged later during the 1970s in rich countries and since then has gradually spread into poorer countries. Abortion, another prerequisite to modern sex selection, has become legalized in a growing number of countries over the last 40 years. Improvements in abortion technology, particularly the spread of vacuum aspiration, has also increased the availability of the procedure. The diffusion of ultrasound equipment for fetal sex determination has been specifically linked to rising sex ratios at birth in China and Vietnam (Chen et al. 2011; Guilmoto et al. 2009).

The introduction of sex-selection technologies may therefore explain the rise in prenatal sex selection. Similarly, changes in TFR levels could also impinge upon reproductive choices of couples. For instance, a drop by one child in average family size doubles the probability of having no sons, and such fertility decrease in less than five years has been observed in countries such as Brazil, Iran, Zimbabwe, and China.[5] It has long been asserted that the strict enforcement of the one-child policy was responsible for the rise in sex-selective abortions in China, but the circumstances of the rise of SRB in China are more complex (Goodkind 2015). Beyond the policy factors, we have already mentioned the potential impact of the diffusion of new technology, and a more formal analysis recently stressed the specific role of the land reforms introduced around 1980 (Almond, Li, and Zhang 2013). In theory, therefore, a combination of several factors might affect the propensity to select the sex of offspring.

As we stated earlier, however, changes in reproductive conditions may not have an immediate effect on birth masculinity. It may take time for parents to decide to directly influence the sex of their children in order to meet their gendered reproductive objectives. The delay between potential and actual behavior may be due both to access to information on new technology options and to the gradual acceptance of interfering with nature (Lesthaeghe and Vanderhoeft 2001). Some intervening factors may then act as triggers leading parents to envisage a change in their earlier reproductive practices based on the random distribution of births by sex. As such, the onset of the rise in SRB corresponds to a sudden change in people's reproductive behavior, representing a "critical juncture," which, according to Mahoney (2000), may determine long-term shifts in social institutions.[6] While not random in nature, these events are marked by contingency; and as instances from the three countries studied will show, they can be extremely diverse and hardly predictable. But we should expect the date of the onset to shed light on the short-term mechanisms likely to have triggered irreversible changes in deeply rooted reproductive practices. The onset inaugurates an almost continuous rise in the SRB, but, after a decade or so, this process invariably ends when the SRB plateaus at a skewed level corresponding to a new demographic regime in which a given proportion of girls are prevented from being born.

Data, method, and findings

It has proved difficult to date the inception of a skewed sex ratio at birth in several countries given the lack of adequate statistical data. India, for example, has no reliable birth registration data. In China, the only available series is a national estimate published by the National Bureau of Statistics, which may be affected by significant measurement issues (Goodkind 2011). In South Korea, random fluctuations caused by traditionally inauspicious years and birth registration quality tend to obscure the analysis of earlier SRB trends, and it is not clear whether the rise in birth masculinity should be dated to 1981 or 1982. In this study, we use microdata from three countries to examine the timing of changes in the sex ratio at birth by year, quarter, and month.

Data

Civil registration systems usually do not provide disaggregated birth statistics by sex and month. In the three countries under study, one (Vietnam) never publishes birth statistics, and vital rates are usually computed from annual demographic surveys based on limited samples. In the other two countries (Albania and Georgia), birth data are not available for individual months or quarters. In addition, the quality of birth registration is especially uncertain, as the 1990s were a troubled decade for these countries following the fall of their socialist regimes in 1991 (Georgia) and 1992 (Albania). In addition, the bureaucratic disorganization of the 1990s has severely reduced the quantity and quality of available birth registration figures.[7]

We exploit here an alternative source based on census data by age and sex. Census samples usually include date of birth and can therefore be used for computing sex ratios by month and trimester of birth. For the relatively small populations of Albania and Georgia, we had access to the entire census database of 2001 and 2002 respectively. For Vietnam, the statistical office released a large sample from the 2009 census, and we also used the 2014 population survey for confirmation.

The three census samples are described in Table 1. We computed the average size of birth cohorts per month and quarter during the 15 years preceding the census. The SRB is affected by random variations when the monthly number of births is limited. For Albania and Georgia, the corresponding 95 percent confidence intervals by month—here computed for a baseline SRB of 105—ranges from 99.3 to 111. For quarterly data, the confidence interval narrows to 101.7–108.4.

Method and findings

This research is based on the hypothesis of the presence of significant breakpoints. These are dates when a significant change in SRB trends is

TABLE 1 Characteristics of the datasets of birth cohorts of Albania, Georgia, and Vietnam

Country and source	Sample size (in thousands)	Average birth cohort (in thousands)	
		Per month	Per quarter
Albania			
2001 census	3,069	4.9	14.8
Georgia			
2002 census	4,405	5.1	15.4
Vietnam			
2009 census	14,178	19.3	57.9
2014 inter-censal survey	4,214	5.6	16.8

observed—usually from a normal SRB level before the breakpoint to a continuous rise afterward. We postulate the presence of a flat trend close to a normal SRB level followed by a positive slope after the breakpoint date measured in month or quarter.[8] If the rise in the SRB over the period studied was slow and progressive, following, for instance, a logistic curve typical of diffusion processes, there may not be a detectable breakpoint. The slope would be positive for the entire period, with no statistically significant change. Otherwise, it may be possible to spot any discontinuity in the rate of change in the SRB and to locate the breakpoint as the date with the statistically most pronounced discontinuity.

We used the sex ratio of birth cohorts to estimate monthly and quarterly variations in the original SRB. A vast majority of the population in these three countries is literate, and age mis-statement is rare. We initially corrected the sex ratio of each birth cohort for mortality—by applying a survival sex ratio drawn from corresponding WHO life tables—and for seasonal variations. Because these corrections did not affect monthly trends and variations, we retained the original census-based sex ratios by date of birth as an indicator for the SRB, which means that our figures tend to underestimate the actual SRB because of the excess mortality of male children. As the illustration presented in the Appendix shows, monthly and quarterly SRB estimates are affected by random variations, but this does not prevent the identification of different broken lines. In addition, we were able to apply a family reconstruction method to rank children within families by birth order and to identify children born after the birth of two or more girls (Guilmoto 2017). The reconstruction provided a series of SRB estimates for children born in families with previously only female births, a population highly vulnerable to sex selection. This subsample of births, however, is smaller.

To detect change in the SRB, we examined the series for the three countries with the *Joinpoint* software[9] developed to identify breakpoints affecting trend data in mortality research (e.g. Goovaerts and Xiao 2011)

**TABLE 2 Breakpoints in the SRB trendlines computed on monthly
and quarterly variations in birth masculinity in Albania, Georgia,
and Vietnam**

| Sample | Time unit | Date of breakpoint | Slope of trendlines | |
			Before the breakpoint	After the breakpoint
Albania 2001	Month	March 1997*	.0000^{ns}	.0003***
	Quarter	Q1 1997***	.0000^{ns}	.0003***
Georgia 2002	Month	January 1992***	.0000^{ns}	.0002***
	Quarter	Q1 1992***	.0000^{ns}	.0002***
Vietnam 2009	Month	August 2003***	.0000^{ns}	.0002***
	Quarter	Q3 2003***	.0000^{ns}	.0002***
Vietnam 2014	Quarter	Q3 2003*	.0000^{ns}	.0001***

NOTES: See Table 1 for sample size and characteristics.
Significance levels for dates relate to the variations in slope coefficients.
ns: not significant, * 5%, ** 1%, *** 0.1%
Slopes are computed over proportions of male births (rather than SRB).
The 2014 Vietnam sample does not provide significant monthly estimates.

and previously applied to SRB trends in the US (Mathews and Hamilton
2005). Joinpoint regression is a statistical modeling technique that fits a
time series by means of a segmented linear regression and requires no pre-
liminary assumption about breakpoints.[10] Of particular importance are the
dates where the slope of the regression function changes in a significant
manner. The strength of the breakpoints and linear segments can be tested
statistically in order to find the best parameters. The analysis was conducted
for a period of ten years before the census, and we tested for the presence
of 0, 1, or 2 breakpoints in the SRB trendline.

The results for the four samples are summarized in Table 2. The table
includes the best breakpoint dates for the change in SRB trendlines. The
SRB trends before these dates were systematically flat, demonstrating no
increase in birth masculinity at the national level. This average trend may,
however, conceal increases in specific regions where son preference is
stronger or among pioneer social groups with lower fertility and greater
access to sex-selection technologies. After the respective breakpoints, the
slope of the sex ratio trends is positive in each country for several years.
We examine these results in greater detail in the next section, starting with
Georgia, where the onset of birth masculinization is the earliest in our
sample.[11]

Three case studies: Georgia, Albania, and Vietnam

In this section, we summarize the findings on breakpoints in each country
in relation to other demographic trends and examine the contextual factors
likely to have triggered this inception of rising sex ratios.

FIGURE 1   Sex ratio of quarterly birth cohorts and estimated trendlines, Georgia 1989–1999
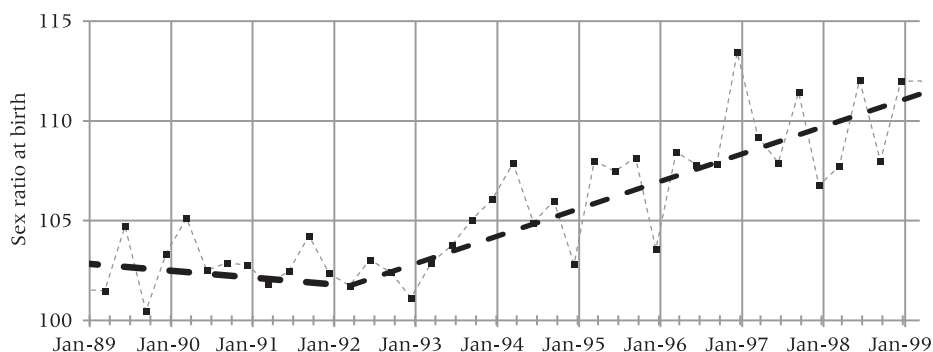
Georgia

Although fertility in Georgia declined steadily between 1970 and 1990, it fell abruptly from 2.5 children per woman in 1991 to 1.6 in 1993. As in Russia, this abrupt fertility decline paralleled the economic and political turmoil following independence. The decline in TFR continued until the end of the 1990s in Russia, Ukraine, and Belarus; fertility stabilized in Georgia after 1994 and remained close to 1.6 for a decade.[12]

As fertility in Georgia was dropping, the SRB, hitherto stable at 105 male births per 100 female births, began to increase during the first quarter of 1992. The onset of this decade-long increase can be identified in January 1992 (see Table 2 and Figure 1). This date corresponds to conceptions taking place nine months earlier, in April 1991, exactly when Georgia became independent. In families with no son, the rise is even detectable from November 1991 onward.[13] From 1992 onward, the sex ratio of Georgian cohorts increased at a yearly rate of 1.4 male births per 100 female births until 1999, the year in which it peaked. According to birth registration data, the SRB stabilized afterward at a level close to 114 in 1999–2004. Since then it has recorded a continuous decrease, so that Georgia's SRB is now below that of its neighbors, Armenia and Azerbaijan (Duthé et al. 2012; UNFPA 2015).

The SRB/fertility comparison indicates that a new TFR equilibrium in Georgia had already been attained by 1994, whereas the sex ratio at birth kept increasing until 1999. We also note that Russia and other former Soviet Republics north of the Caucasus—where fertility decline extended over the entire decade—experienced no rise in birth masculinity after 1991.

Given the instability of Georgia's political and economic environment by 1990, it is not surprising that fertility dropped sharply. To terminate unwanted pregnancies, women for the most part resorted to abortion, the most commonly practiced method of family planning in Georgia at the time.

Although restricted after World War II as part of Stalin's pronatalist policy, access to abortions was eased by Khrushchev's reforms. In the absence of oral contraceptives, which doctors distrusted, as well as poor-quality IUDs, condoms, and cervical caps, abortion became the prevalent means of limiting fertility (Michael et al. 2013). It is clear that declining fertility was a response to the unprecedented political and economic instability in 1991: once a seemingly stable region, with high employment, accessible education and health care, and an array of social supports, including pensions, the Soviet Union collapsed with surprising speed, and daily life in Georgia became harsh and unpredictable.

In April 1991 Georgia declared independence, and the Soviet Union was dissolved in December of the same year; 1992 ended with armed conflict in central Tbilisi. Concurrent with the emergence of an independent Georgian state, two ethnic enclaves bordering Russia (Abkhazia and Ossetia) sought to separate themselves from Georgia, leading to conflicts that resulted in thousands of deaths and tens of thousands of displaced persons throughout Georgia (Slider 1994; Jones 1997). Concurrent with the political upheaval, the Georgian economy continued to spiral downhill until 1994. Industrial output, incomes, and consumption dropped precipitously as a result of opposition strikes and transport disruptions after 1989. In 1990–91, responding to Georgia's restriction on exports, Russia subjected Georgia to a partial economic blockade; without energy supplies from Russia, much of Georgian industry came to a standstill. Enterprises were no longer able to pay wages, prices steadily rose, and even basic items such as bread were in short supply. In 1990, prices approximately doubled and they rose tenfold in 1992. By the end of 1993, Georgians who had accumulated their earnings in the government savings bank, the *Sberkass*, had lost their lifetime savings (World Bank 1993, 1999; Slider 1994).

Although under-the-table fees for medical services were already a fact of life in Georgia, the unofficial price of delivering a child in the new environment was daunting. Given the many reasons *not* to have children, what change occurring in spring 1991 resulted in an observable rise in the SRB in January 1992, rather than simply a decline in the number of births? Was it simply that ultrasound technology became more accessible, or also that the conditions people were living under increased the perceived value of sons?

Son preference in Georgia, as in other strongly patrilineal countries where it appears, has historical roots. Sons carry on the family name and continue the lineage, while daughters marry into other families. At least one son is expected to remain with his parents after he marries, inheriting their property and supporting them in their old age. Daughters may continue to provide some moral support and day-to-day care, but their primary loyalties and labor belong to their husband's family. Having at least one son also affirms the father's masculinity and strengthens the position of the mother, who is otherwise vulnerable after she leaves her natal

family to join her husband. Particularly in rural areas, women often continued to have children until they could produce at least one son (Dudwick 2015; UNFPA 2015).

Throughout the Soviet period, sons remained pivotal to the strong lineage and reciprocity relations that ordered Georgian society and buttressed men's political power. In the 1970s and 1980s, these relationships of solidarity and trust had helped make Georgia the "epitome" of the black market economies in the Soviet Union (Grossman 1977, cited in Mars and Altman 2008). These networks were critical for obtaining goods and resources in a command economy unable to meet its citizens' daily needs (Mars and Altman 2008) and for generally navigating the complex and unpredictable bureaucracy (Dragadze 1988).

Yet, until the late 1980s, the Soviet Union had no capacity to manufacture quality ultrasound equipment, and the West restricted exports of such equipment to the Soviet Union because of its potential military use. Prenatal sex selection was therefore technically not feasible in Georgia. These restrictions on technology imports diminished in the late 1980s as *perestroika* and *glasnost* took hold. By the late 1980s, diagnostic ultrasound technology became more widely available, and Soviet Ministry of Health documents record the use of 3,000 Soviet machines and 1,000 imported machines, many of which were used in nationwide outpatient clinics providing reproductive health services for women (Michael et al. 2013). The first imported ultrasound machine capable of detecting fetal sex appeared in Tbilisi in 1987, and the first private clinic providing services to women opened in 1991.[14] Although it is difficult to piece together how quickly these services spread outside Tbilisi, it can be assumed that once people learned of their availability in Tbilisi, they found the money to travel to the capital. By 1995, ultrasonography was readily available in clinics throughout Georgia.

Despite the coincidence of timing, it is difficult to ascertain whether the SRB increased only because ultrasound made it possible for people to act on existing gender bias in a context characterized by drastic fertility decline, or whether son preference actually increased during this period. This question arose during a study of current attitudes toward sex-selective abortion undertaken by the World Bank in 2015 (Dudwick 2015). Elderly respondents were unanimous in asserting that Georgians had always wanted at least one son in the family, but some noted that whereas people had previously accepted that they would have daughters along the way until they could deliver a boy, now, as one woman put it, "they only need a boy." Another female respondent noted that if Georgian women had been able to learn the sex of the fetus, fewer girls would have been born during the Soviet period. Affirming the importance of a son, many respondents provided examples of women who were divorced by their husbands or otherwise punished for failing to give birth to sons. Respondents described the shame that men in particular felt when they were unable to pass their property on to a son.

Although sons were important to families throughout the Soviet period, son preference may have been less acute than it became in the 1990s, for two reasons. First, Soviet family policies encouraged egalitarian gender relations, at least in terms of broader access to education and labor force participation for women; second, the Soviet state provided basic health care and social protection, including pensions. By the late 1980s, however, the steady deterioration of economic conditions and the related growth of nationalism in Georgia and elsewhere contributed to the "retraditionalization" of gender relations, including the patriarchal family, a trend also observed in Eastern Europe (Kaser 2008) and Central Asia (Commercio 2015). Disempowerment or the overwhelming sense of instability and insecurity may have convinced some families that having a son (capable of hard physical labor, able to migrate for work, and better positioned than a daughter to negotiate with authorities) was an essential survival mechanism. Sons, more than daughters, would support elderly parents and offer physical protection in a conflict environment. In addition, Michael et al. (2013) have suggested that violent ethnic conflicts might diminish women's bargaining power, and recent research suggests that Georgian women often undergo repeated pregnancies or abortions under pressure from their husbands (see also Dudwick 2015).

We conclude that the sudden reduction in TFR levels by one child during the early 1990s doubled the likelihood of not having a son.[15] This circumstance generated a new demand for ultrasound equipment that emerging private clinics were gradually able to meet, thanks to import liberalization. Georgians responded immediately to the post-1991 crisis by reducing high-order births, but the impact of new ultrasound facilities over the next ten years took longer to manifest itself. This cumulative progression conforms to a gradual diffusion of ideas and of methods of prenatal sex selection across Georgian society—from cities to villages and from higher to lower socioeconomic strata.

Albania

The increase in the SRB in Albania dates back to 1997 (see Table 2 and Figure 2). Prior to that year, birth masculinity was marginally increasing, though the measured slope is not significant. The SRB trendline changed during the first quarter of 1997, inaugurating a period of sustained annual increase of 1.8 male births per 100 female births. Birth registration data for the period following the 2001 census suggest that the SRB reached a peak in 2006 at a record level of 114 male births per 100 female births (UNFPA 2012b). Since then, the SRB has diminished and stabilized at a plateau of 109 in 2013–15. This level is almost identical to the SRB level observed in neighboring Kosovo and Montenegro (UNFPA 2016). Contrary to what was observed in Georgia after the fall of the Communist regime, there

FIGURE 2   **Sex ratio of quarterly birth cohorts and estimated trendlines, Albania 1990–2000**
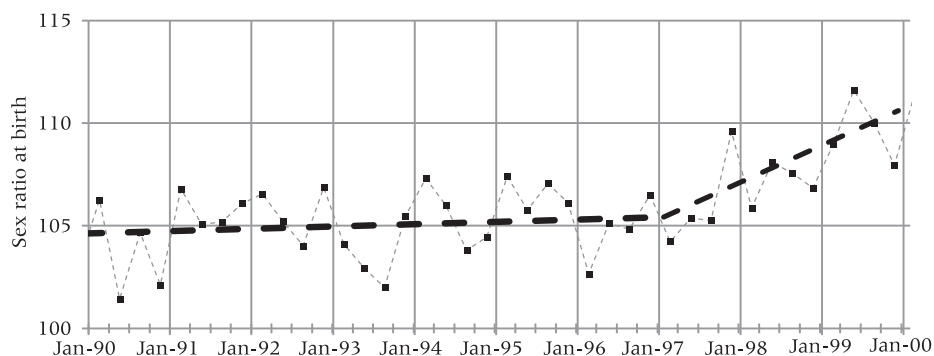
was no visible correspondence between regime change and fertility trends. Albania's TFR started to decline continuously during the 1960s, reaching 2.4 children per woman in 1997 and stabilizing only later at a level close to 1.7 after 2005 (Gjonça et al. 2008).

At the end of World War II, Albania was a patrilineal and patrilocal society, governed by feudal laws and traditions. Sons usually remained in their parents' household after their own marriage, while daughters joined their husband's family. Women's low status was notably enshrined by the Kanun of Lek Dukagjini, a set of traditional, orally transmitted laws from northern Albania (Mangalova 2004). All property and civic rights were vested in men, with women occupying a marginal position in society. The government began to dismantle patriarchy and introduced an egalitarian system, effectively removing any sources of authority or legitimacy other than the Communist Party. Sex differentials in education and employment were reduced or abolished over the decades until 1990. But the collapse of the Communist regime entailed dramatic consequences such as large-scale unemployment that first affected women, and a revival of the traditional collective norms and honor-oriented culture (Mosquera et al. 2000). Surveys recorded a sharp increase in reported violence (UNDP and INSTAT 2013), and the divorce rate also increased during the transition.

Another change in Albania with a potential effect on gender equity is the very large migration from 1989 to 2011, during which period a third of the population emigrated. The year 1997 coincided with a new stream of family migration. More than 50,000 Albanians left within a few months to seek long-term security and higher wages in other European countries (Vullnetari 2007; Stecklov et al. 2010; King and Vullnetari 2012). Because a majority of migrants in the initial stages of migration in the 1990s were men, this may have reinforced the demand for sons. While the strength of the relationship between male-dominated migration and the increased demand for sons is uncertain, data on population age structure from the

2001 and 2011 censuses suggest that the Albanian migration has stabilized in terms of male/female sex ratios by age groups.

Historical mortality trends show a male advantage in levels of infant and child mortality in Albania, but these disparities disappeared over the 1970s and 1980s.[16] During the same period, Albania recorded one of the fastest demographic transitions; in a patriarchal society with a high demand for male heirs, this rapid reduction in family size combined with the disappearance of excess female mortality created the conditions for sex selection.

When we examine what could have triggered the immediate rise of SRBs in early 1997, two main reasons emerge for this relatively late date several years after the introduction of democracy. The first relates to abortion legislation. One of the first changes in legislation introduced after Communism collapsed was the legalization of abortion, which produced the conditions for an upsurge in the number of abortions from close to zero to about 200 per 1,000 live births in 2002. The law has gone through a number of changes, but the most important ones were implemented only in 1995 (Ministry of Health 1995). Under the law, abortion could be performed through the first 12 weeks of pregnancy based on different grounds, whether medical, psychological, or socioeconomic. The full legislation was not introduced until December 1995, about one year before the rise in birth masculinity. During this period, abortions were performed in public hospitals and only became available in private clinics with the start of the millennium. Women still needed a medical doctor's report stating the reasons for abortion. In addition, ultrasound equipment at that time was accessible only in hospitals.

It is not possible to cite exact figures on the number of abortions during this period, as the data during the transition are unreliable and differ from one source to the other. Thus, in two reproductive health surveys, the level of induced abortion was at 73 per 1,000 live births in 2002 and about 90 per 1,000 in 2008, compared with official figures of 200 per 1,000 in 2002 and 272 in 2007. The main reason for this discrepancy is that abortion was taking place illegally either outside the medical system or within the medical system but without the consent of the medical report as the law demanded.

A second main reason for the rise in the SRB in Albania relates to the collapse of the economy and the increased political and public unrest, a context similar to that observed in Georgia after 1991. In late 1996 and early 1997, the country experienced civil unrest triggered by the collapse of Ponzi financial schemes. The collapse caused the loss of large amounts of money and whole livelihoods for a large proportion of the population, and it precipitated the departure of thousands of Albanians abroad. The economic crisis and political strife did not result in a distinct drop in TFR or a rise in mortality. Nevertheless, the GDP contracted temporarily by 10 percent in 1997 (World Bank 2007); Lerch (2013) detected a sudden drop in

third births during the same year. Yet, the rise in the SRB during the first quarter of 1997 seems to closely track the country's deteriorating situation. Protests became increasingly violent in January 1997, and the country experienced political unrest, civil disorder, and organized crime. The severity of these events peaked in March of that year, exactly coinciding with the aforementioned rise in the proportion of male births.

Clearly, both the liberalization of abortion and, to a lesser extent, the 1997 crisis can be linked to the rise of the SRB in Albania. The impact on birth masculinity of changes in abortion legislation has been observed in Taiwan and Nepal, two countries where easier access to pregnancy termination as a result of liberalization of abortion laws paved the way for a rise in the proportion of male births (Lin et al. 2008; Valente 2014), and Albania may be an additional case.

Vietnam

Of the three countries investigated, Vietnam has experienced the most recent rise in the SRB. Despite an erroneous report of a rise in the early 1999 census data (Bélanger et al. 2003), it has commonly been assumed that the national onset of a skewed SRB occurred in 2004–2005 (GSO 2011). The monthly data analyzed for the first time here suggest an earlier date, since they clearly show that Vietnam's sex ratios at birth started to increase after August 2003 (see Table 2 and Figure 3).[17] Before that period, the SRB oscillated around 106 with no distinct trend.

After 2003, the national SRB increased regularly at a yearly rate of 0.8 male births per 100 female births. Compared to Albania and Georgia, this slower tempo of annual SRB increase may be explained by the more heterogeneous population of Vietnam, where several regions and ethnic groups have recorded no significant rise in birth masculinity (Guilmoto 2012). At the national level, the SRB has continuously increased since 2003

FIGURE 3   Sex ratio of quarterly birth cohorts and estimated trendlines, Vietnam 1999–2009
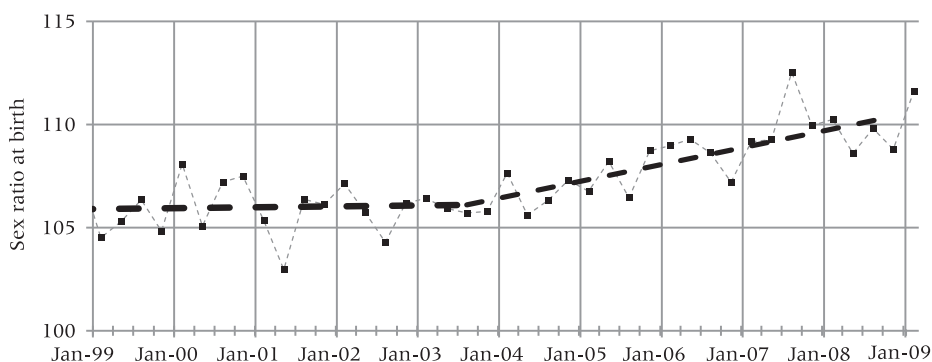
and stabilized at 113 in 2015 (GSO 2016a and 2016b). Today, Vietnam has one of the highest SRBs in the world.

Like Albania and Georgia, Vietnam has a long history of son preference, closely related to its strong patrilineal and patrilocal heritage (Haughton and Haughton 1995; Bélanger 2002). Sons are preferred for economic and cultural reasons, many of them linked to Confucian beliefs and ancestor worship (Croll 2000). Unlike Albania and Georgia, the rise of the SRB in Vietnam cannot be associated with any fertility-related or economic shocks. Fertility decline has long been promoted by the Vietnamese government as a part of its socioeconomic development plan (Pham et al. 2013), first in the form of a two-child policy (1988) and later in the form of a one-to-two-child policy (1993). Vietnam's achievements in lowering the TFR—from 3.8 in 1989 to 2.3 within one decade—were recognized by the receipt of the 1999 United Nations Population Award (Pham et al. 2008: 178). Fertility-control policies put pressure on Vietnamese couples to produce a son with fewer births, but no dramatic change in birth masculinity occurred during this period of rapid decline. By 2003, the TFR had declined to 2.1 children per women and has since remained close to replacement level (GSO 2016a). Economically, Vietnam has experienced sustained and continuous growth since the 1990s. While the SRB has been negatively affected by economic insecurities elsewhere (e.g. Georgia after 1991; South Korea following the 1997 Asian financial crisis), this was not the case in Vietnam. Scholars have, however, argued that the economic liberalization in 1986 (*Doi Moi*) and the absence of a functioning social welfare system left families dependent on their male offspring for financial security in old age (Barbiéri and Bélanger 2009). If a shift in fertility or the economy did not trigger the SRB onset in Vietnam, other factors must have affected the reproductive choices of Vietnamese couples.

Abortion up to 22 weeks of gestation has been legal in Vietnam since the 1960s and was practiced as a means of population control (Hoang, Phan, and Huynh 2008). Sex determination became possible only after Vietnam's economic liberalization, which generated an influx of modern reproductive technologies, a growing network of private health care providers, and the "commercialization of childbearing" (Gammeltoft and Nguyen 2007: 165). In 1989, the Law on the Protection of Public Health was passed, granting women legal access to abortion on demand. The law also stressed the government's "duty to consolidate and expand the network of obstetric and neonatal health care to the grassroots level" (Harvard School of Public Health 2008). This access to medical services allowed for a rapid increase in abortions in the early 1990s (Goodkind 1994). In 1996, Vietnam recorded one of the highest abortion rates worldwide: an estimated 111 abortions per 1,000 women aged 15–44—about 2 million procedures in total—were performed that year (Henshaw, Singh, and Haas 1999). Along with abortion services, affordable prenatal testing became widely available

throughout Vietnam, representing an important source of revenue for public and private health providers (Gammeltoft and Nguyen 2007). By 2002, 86 percent of surveyed pregnant women received prenatal care from medically trained health workers, compared with 71 percent five years earlier (GSO 2003). Women living in the Red River Delta—where sex selection is most prevalent—had the highest prenatal care coverage (98 percent) in 2002. Having access to high-quality images and better diagnostic capabilities allowed couples to know the sex of the fetus at 13 weeks of gestation, well before the 22-week abortion limit. This new knowledge exerted pressure on couples, who no longer had the option to blame fate for remaining sonless (Becquet 2015).

The availability of abortion and the routine use of ultrasound services in Vietnam were further accelerated by three major health reforms in the early 2000s. First, the government started to promote ultrasound as part of the National Population Strategy for 2001–2010 as a means of enhancing the "physical quality of the population" (Gammeltoft 2014: 52–53). This included screening for undesired traits and facilitating abortions in order to avoid fetal abnormalities. Soon it became evident that the same services could be used to avoid other "undesired qualities," such as the sex of the fetus (Bélanger et al. 2003). Second, the financial autonomization of hospitals, introduced in January 2002 (Government of Vietnam 2002), encouraged public hospitals to become self-sufficient, mobilize private capital, and invest in modern equipment. According to London (2013: 236), this reform led to "the rapid expansion of 'patient-requested services,'" and ultrasound began to be frequently requested for sex determination (Gammeltoft and Nguyen 2007). Third, in 2002 the Ministry of Health issued National Standards and Guidelines for Reproductive Health Care Services. Drafted with technical assistance from UNFPA (Bondurant, Henderson, and Nguyen 2003), these guidelines were designed to improve safe abortion services in Vietnam (Wolf et al. 2010). Subsequently, new abortion methods were introduced that proved safer and more efficient than the old Kovacs method (Tran 2011). These three health reforms improved the supply and commercialization of technology, while paving the way for normative changes that made sex-selective abortions increasingly socially and morally acceptable. However, the implementation of these reforms was spotty and continued well into the late 2000s.

As access to abortion and reproductive services improved, Vietnamese authorities were aware that sex selection was likely to increase as well. Results of the 1999 census caused concern among national demographers and policymakers, who identified SRB fluctuations in a number of provinces and forecasted sex imbalances in Vietnam due to the country's political and cultural similarities with China (Croll 2000).[18] A member of the drafting committee of the Population Ordinance at the National Assembly stated in an interview in 2015, "My committee started to think, why big countries like

China and India are facing this problem, why not Vietnam?" Vietnamese legislators were aware that other governments in the region (e.g. China, India, and South Korea) had already issued policies against sex selection (Socialist Republic of Vietnam 2003). Sensitized by the ICPD Programme of Action and by policy experiences in other Asian countries, Vietnam introduced legislation against sex selection before it became widespread.[19] The Population Ordinance was issued in early January 2003. Nine months later, starting in September, the SRB started to increase on a national level. The rise in the SRB thus corresponds closely to the introduction of legislation against sex selection.

The Population Ordinance officially recognized, for the first time, fundamental reproductive rights and gave couples the freedom to decide the timing, number, and spacing of births, while prohibiting any form of prenatal sex selection. It urged the state to adopt policies to prevent sex selection and "eliminate all forms of gender discrimination." Paradoxically, this ordinance, intended to promote more liberal reproductive rights, directly coincides with the national onset of sex selection. How can this be understood? Prior to this, sex selection was a "taboo issue" (Bélanger et al. 2003: 243). The Population Ordinance broke this taboo and increased both media and public attention to sex selection and its prohibition. As a result of the Population Ordinance, sex selection—as a novel reproductive strategy—had become a national topic of conversation by 2003.

The parallel between policy change and SRB onset does not imply that previous developments in the economy, fertility, and medical services were not essential in creating the necessary conditions for the phenomenon to emerge. It merely indicates that the actual onset begins in concert with the Population Ordinance and suggests that the new legislation was able to trigger the rise in SRB because of underlying factors already in place that produced an environment where sex selection suddenly became known, feasible, and desirable to a growing number of Vietnamese couples. Passage of the ordinance appears to show the strongest correlation to the rise in birth masculinity in Vietnam after August 2003. Whether it actually had the unintended effect of facilitating prenatal sex selection, when explicitly prohibiting it, remains difficult to prove given the lack of counterfactuals. However, in this analysis we were able to exclude other potential triggering events that could explain the sudden change in SRB trends in Vietnam.

Conclusion and discussion

Our analysis offered a more fine-grained examination of sudden changes in SRB trends by using disaggregated data from Albania, Georgia, and Vietnam. We dated the onset of birth masculinization and identified the potential triggers of this long-term change in SRB trends in these three countries.

Our analysis has shown that it was possible to identify one singular break-point corresponding to the rise in the SRB in each country. These turning points can be precisely dated in quarters, and at times in months, when the sample data allow. Thus, the rise in the SRB appears to have clearly started in January 1992 in Georgia, during the first quarter of 1997 in Albania, and in August 2003 in Vietnam. From those starting dates, the SRB increased steadily until it leveled off at around 110–115 male births per 100 female births. In this new reproductive regime, a significant proportion of families had opted for selective pregnancy termination to avoid unwanted girls.[20]

The interpretation of these dates in their national contexts led to both expected and unexpected findings. In Georgia, the rise closely followed the country's independence, which inaugurated a period of turmoil for Georgian society and economy. The fertility decline likely had the most direct consequences on the reproductive strategies of couples who were previously willing to have additional children to ensure the presence of a son. In comparison, the transition from a socialist to a capitalist regime spanned several years in Albania and the SRB started increasing later. While the 1997 political unrest in Albania might have had some impact, the liberalization of abortion in a country where it had been severely prohibited during the Communist era was probably the primary factor encouraging the diffusion of sex-selective abortion in a context characterized by a pent-up demand for sex selection. Vietnam is a more puzzling case. The country had long been under scrutiny because of its similarities with neighboring China. Not only had son preference long been observed and measured, but fertility decline had been strengthened by strict family planning policies, and abortion was easily available. Earlier studies suggested that the missing piece in this picture was the lack of quality ultrasound equipment in Vietnam, but both population samples used here point to a distinct rise in sex-selective abortion from 2003, closely associated with a major shift in population policy. It may seem paradoxical that a less-restrictive policy specifically prohibiting targeted abortions set in motion a more active form of gender bias through prenatal sex selection.

In retrospect, the rise in the SRB in these countries appears primarily related to the disruptions of a previous reproductive system based on a stable family norm, inefficient sex-selection services, and random birth masculinity. The three sequences of events we identified in this study—abortion legislation, population policy initiatives, and economic crisis—appear somewhat contingent. They obviously played an important role in the ensuing rise of the SRB, but they should be seen here only as triggers rather than causes. New legislation in Albania and Vietnam did not cause the SRB to rise within a few years to levels above 110. Instead it signaled the end of a previous reproductive regime in which families had to cope with a purely random distribution of daughters and sons, followed by the acceptance of

sex selection as an instrument of calculated choice in fertility. The political and economic turmoil linked to the independence of Georgia (and its Caucasian neighbors) had even wider consequences far beyond the strict domain of reproduction.[21]

These events in the three countries studied here should be seen as powerful mechanisms that upended slow-changing reproductive institutions in an irreversible manner, forcing them to adapt rapidly to a broader environment in which the pressure from changes in fertility levels, economic security, reproductive technologies, and the role of families in society had built up over the years. Once destabilized, the reproductive regime in each country underwent a sudden change in trajectory. The SRB then increased continuously for almost ten years until it reached a new equilibrium reflecting couples' optimal response to their new reproductive priorities and opportunities.

From a path-dependent perspective, the different cases of onset of birth masculinization analyzed here correspond to typical transformations in demographic behavior triggered by contingent occurrences, that is, events that cannot be explained by initial conditions (Mahoney 2000). We do not mean that contingent occurrences are purely random factors unconnected to the main preconditions of sex selection since they are obviously linked to one of the three preconditions of skewed SRB. While the influence of the specific events identified here was at times unexpected, the process, once set into motion, seemed irreversible as sex selection spread across the population, among whom the need for a son often overcame other practical or moral considerations. The diffusion mechanisms of prenatal sex selection are much more familiar to demographers as they echo, for instance, the dissemination of the small-family norm during fertility decline. The main difference is that the rise in birth masculinity proceeded much faster and leveled off within a decade.

The current decline in the proportion of male births observed in some regions suggests that the high SRB equilibrium observed elsewhere may not be permanent. It is, of course, too early to discuss the process of SRB transition in the countries studied here, especially as the SRB in Albania and Vietnam has not shown any sign of downturn. But the factors likely to cause a turnaround will probably be very different from those that initially engendered its rise. Greater gender equity—rather than fertility trends or sex-selection technologies—is most likely to spur future change. But in spite of the influence of structural factors such as female employment, broader social protection, or weakening family solidarity, we may also expect some unpredictable contextual events—such as policy changes and interventions, family and gender reforms, media campaigns and advocacy, or political transformations—to trigger a return of the sex ratio at birth to normalcy that is as rapid as was its initial disruption.

Appendix

Illustration of the method

We use data from the 2009 census of Vietnam to illustrate our methodology. The core dataset is the distribution of the population by date of birth computed by month and quarter for the 15 years preceding the census. The raw sex ratio of these monthly and quarterly birth cohorts shown in Appendix Figure A1 display sizable variations. Monthly SRB estimates might be 6 points above or below the trendline. Quarterly figures fluctuate less (+/− 3 points) since they are computed on samples that are twice as big.

     We added a smoothed series computed with moving averages over 11 months. This smoothed series is still affected by oscillations, especially before 2002. The most significant model drawn from the Joinpoint regression is also added in the figure. It divides the trendline into two different segments, with a breakpoint between the two series located in August or

FIGURE A1   Sex ratio of monthly and quarterly birth cohorts and fitted trends, Vietnam 1995–2009
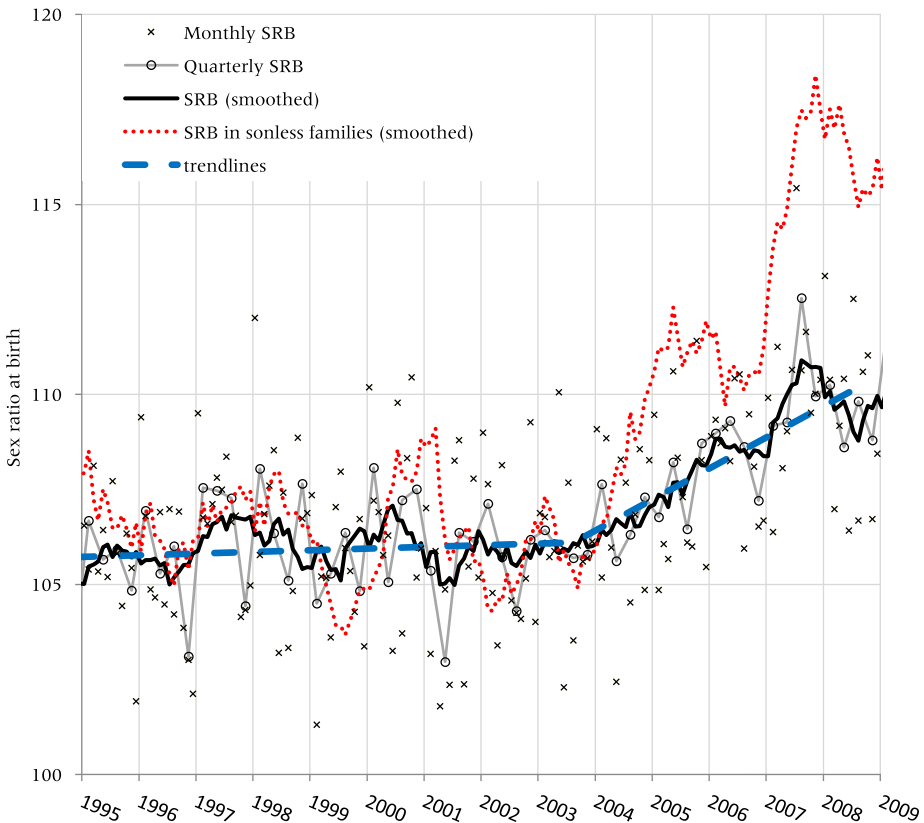
the third quarter of the year 2003. All model parameters are significant at 0.1 percent (see Table 2). The first part of the trendline on the left corresponds to the period prior to 2003, during which the slope of birth masculinity was flat. After 2003, the second line segment on the right corresponds to a sustained increase in the sex ratio at a rate of .8 per year.

We also included the smoothed series of the sex ratio computed among children born in families with only daughters. Fluctuations are broader because of the smaller size of this subpopulation. Yet we can also distinguish a flat trend until 2003 and a sustained rise thereafter. The sex ratio of these children increases twice as fast as the overall sex ratio, and it exceeds 115 from 2007 onward.

Notes

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1 There are several countries with reliable birth registration statistics in which the sex ratio at birth has exceeded 108 for one or more years: Bulgaria (1997), Estonia (2005, 2006), Greece (2001), Slovenia (1998, 2001). Data used here are from Eurostat. On the natural sex ratio at birth and its variations, see Chahnazarian (1988) and James (2009).

2 This figure is calculated as the number of additional male births if the SRB had started to increase in 1993 instead of 2003 and had plateaued at 113 male births per 100 female births ten years later. Annual estimates of births are taken from United Nations (2015).

3 Georgia's trajectory closely reflects that of Azerbaijan and Armenia, where fertility decline and SRB rise proceeded almost simultaneously after the collapse of the Soviet Union in 1991. Albania's story is more typical of Southeast Europe, while Vietnam's belated SRB rise is probably a case apart. Lack of disaggregated data and extreme regional diversity of demographic trajectories preclude a similar analysis for China and India (see, however, Almond, Li, and Zhang 2013).

4 For an overview, see Guilmoto (2015) and UNFPA (2012a).

5 Rates of fertility decline are computed from recent UN estimates (United Nations 2015).

6 Parents previously had other options to shape the sex composition of their offspring, including the stopping rule, postnatal sex selection, or adoption. At a given period, a preference for prenatal sex selection emerges because of its specific advantages of preventing unwanted female births, and it fast becomes a norm among a section of the population.

7 Several reports document the availability of data needed for estimating birth masculinity in these three countries. See UNFPA (2012b, 2015) and GSO (2011).

8 The method corresponds to a segmented regression in which each fitted segment reflects a distinct trend before and after the breakpoint (Muggeo 2003).

9 The regression analysis was conducted using the public-domain program (Joinpoint Regression Program, Version 4.3) developed at the National Cancer Institute: http://surveillance.cancer.gov/joinpoint. See also Kim et al. (2000).

10 See also Ouelette et al. (2014) for a methodological discussion applied to the identification of mortality trends.

11 A similar breakpoint analysis was conducted with birth cohorts (not reported here). Georgia was the only country with a detectable change in fertility trends (see detail below).

12 A similar stabilization was observed in Armenia and Azerbaijan. On fertility dynamics in Russia and other countries of Eastern Europe, see Kohler and Kohler (2002) and Billingsley (2010).

13 This corresponds to pregnancies reaching three months—when fetal sex can be determined by ultrasonography—during the month of May 1991. The breakpoint for the full sample occurs two months later (data not shown).

14 Personal communication from Dr. Nicholas Kintraia and Sergo Matitashvili.

15 The risk of not having a son can be computed as q^{TFR}, where q is the biological proportion of female births (48.8 percent). With Georgian fertility dropping from 2.5 children per woman to 1.5 in 1990–94, the proportion of couples with no son increased from 16.7 percent to 34.1 percent.

16 See Gjonça (2001). In contrast, no significant excess female mortality has ever been documented in Georgia and Vietnam.

17 While this date is rather unexpected as the following analysis will show, both the 2009 and 2014 datasets identify the third quarter of 2003 as the turning point in SRB trends (Table 2). Figure 3 is based on 2009 census data.

18 Our analysis slightly differs from the recent interpretations of Den Boer and Hudson (2017: 137).

19 This section is based on fieldwork conducted in Vietnam in 2015. See Rahm (forthcoming).

20 A simulation suggests that only about 20 to 40 percent of parents in the countries under study resorted to sex selection when the sex ratio at birth reached its peak. If all families after the birth of two girls had opted for sex-selective abortion, the average sex ratio at birth would have risen to 129.

21 Civil unrest in Albania was less intense and shorter and it cannot therefore be equated with the regime change in Georgia.

References

Almond, Douglas, Hongbin Li, and Shuang Zhang. 2013. "Land reform and sex selection in China," NBER Working Paper 19153.

Barbiéri, Magali and Danièle Bélanger. (eds.). 2009. *Reconfiguring Families in Contemporary Vietnam.* Contemporary Issues in Asia and the Pacific. Stanford, CA: Stanford University Press.

Becquet, Valentine. 2015. *De l'inégalité de genre à la sélection sexuelle prénatale: la masculinité des naissances au Viêt Nam* (Ph.D. in Demography). Université Paris Descartes.

Bélanger, Daniele, Khuat Thi Hai Oanh, Liu Jianye, Le Thanh Thuy, and Pham Viet Thanh. 2003. "Are sex ratios at birth increasing in Vietnam?," *Population* 58(2): 231.

Bélanger, Danièle. 2002. "Son preference in a rural village in North Vietnam," *Studies in Family Planning* 33(4): 321–334.

Billingsley, Sunnee. 2010. "The post-communist fertility puzzle," *Population Research and Policy Review* 29(2): 193–231.

Bondurant, Anthony, Sophia Henderson, and Cuong Quoc Nguyen. 2003. "Addressing the reproductive health needs and rights of young people since ICPD: The contribution of UNFPA and IPPF," Vietnam Country Evaluation Report. Hanoi: BMZ, DFID, UNFPA, IPPF.

Bongaarts, John. 2013. "The implementation of preferences for male offspring," *Population and Development Review* 39(2): 185–208.

Chahnazarian, Anouch. 1988. "Determinants of the sex ratio at birth: review of recent literature," *Social Biology* 35(3-4): 214–235.

Chen, Yuyu, Hongbin Li, and Lingsheng Meng. 2011. "Prenatal sex selection and missing girls in China: Evidence from the diffusion of diagnostic ultrasound," Tsinghua University Working Paper, Beijing.

Commercio, Michele E. 2015. "The politics and economics of 'retraditionalization' in Kyrgyzstan and Tajikistan," *Post-Soviet Affairs* 31(6): 529–556.

Croll, Elizabeth. 2000. *Endangered Daughters: Discrimination and Development in Asia*. London: Routledge.

Den Boer, Andrea and Valerie Hudson. 2017. "Patrilineality, son preference, and sex selection in South Korea and Vietnam," *Population and Development Review* 43(1): 119–147.

Dragadze, Tamara. 1988. *Rural families in Soviet Georgia: A Case Study in Ratcha Province*. London: Routledge.

Dudwick, Nora. 2015. *"Missing Women" in the South Caucasus: Local perceptions and Proposed Solutions*. World Bank.

Duthé, Géraldine. et al. 2012. "High sex ratios at birth in the Caucasus: Modern technology to satisfy old desires," *Population and Development Review* 38(3): 487–501.

Dyson, Tim and Mike Murphy. 1985. "The onset of fertility transition," *Population and Development Review* 11(3): 399–440.

Fellman, Johan. 2015. "Glimpses at the history of sex ratio studies," *Science* 3(2): 291–302.

Gammeltoft, Tine. 2014. *Haunting Images: A Cultural Account of Selective Reproduction in Vietnam*. 1st edition. Berkeley: University of California Press.

Gammeltoft, Tine and Hanh Thi Thuý Nguyen. 2007. "The commodification of obstetric ultrasound scanning in Hanoi, Viet Nam," *Reproductive Health Matters* 15 (29): 163–171.

Gjonça, Arjan. 2001. *Communism, Health and Lifestyle: The Paradox of Mortality Transition in Albania, 1950–1990* (No. 8). Greenwood Publishing Group.

Gjonça, Arjan, Arnstein Aassve, and Letizia Mencarini. 2008. "Albania: Trends and patterns, proximate determinants and policies of fertility change," *Demographic Research* 19: 261.

Goodkind, Daniel. 2011. "Child underreporting, fertility, and sex ratio imbalance in China," *Demography* 48(1): 291–316.

———. 1994. "Abortion in Vietnam: Measurements, puzzles, and concerns," *Studies in Family Planning* 25(6): 342–352.

———. 2015. "The claim that China's fertility restrictions contributed to the use of prenatal sex selection: A skeptical reappraisal," *Population Studies* 69(3): 263–279.

Goovaerts, Pierre and Hong Xiao., 2011. "Geographical, temporal and racial disparities in late-stage prostate cancer incidence across Florida: A multiscale joinpoint regression analysis," *International Journal of Health Geographics* 10(1): 63.

Government of Vietnam. 2002. *Government Decree 10/2002/ND-CP on Financial Autonomy of Revenue-Generating Public Service Entities*.

Grossman, Gregory. 1977. "The second economy of the USSR," *Problems of Communism* 26: 25–40.

GSO. 2003. *Vietnam Demographic and Health Survey 2002*. Hanoi: GSO and ORC Macro.

———. 2011. *Sex Ratio at Birth in Viet Nam. New Evidence on Patterns, Trends and Differentials*, Vietnam Population and Housing Census 2009. Ha Noi: General Statistics Office.

———. 2016a. *Major Findings. The 1/4/2015 Time-Point Population Change and Family Planning Survey*. Hanoi: General Statistics Office.

———. 2016b. *Sex Imbalances at Birth in Viet Nam: Recent Trends Factors and Variations*. Hanoi: General Statistics Office and UNFPA.

Guilmoto, Christophe Z. 2009. "The sex ratio transition in Asia," *Population and Development Review* 35(3): 519–549.

———. 2012. "Son preference, sex selection, and kinship in Vietnam," *Population and Development Review* 38(1): 31–54.

———. 2015. "The masculinization of births. Overview and current knowledge," *Population* 70(2): 183–243.

———. 2017. "Gender bias in reproductive behaviour in Georgia, Indonesia, and Vietnam: An application of the own-children method," *Population Studies* 71(3): 265–279.

Guilmoto, Christophe Z., Xuyên Hoàng, and Toan Ngo Van. 2009. "Recent increase of sex ratio at birth in Viet Nam," *PLoS ONE* 4(2): e4624.

Harvard School of Public Health. 2008. "Viet Nam Law on the Protection of Public Health, 30 June 1989," https://www.hsph.harvard.edu/population/abortion/VIETNAM.abo.htm. Accessed May 5, 2017.

Henshaw, Stanley K., Susheela Singh, and Taylor Haas. 1999. "The incidence of abortion worldwide," *International Family Planning Perspectives* 25: S30–S38.

Haughton, Jonathan and Dominique Haughton. 1995. "Son preference in Vietnam," *Studies in Family Planning* 26(6): 325–327.

Hoang, Tuyet T.D., Thuy Phan, and Trang N.K. Huynh. 2008. "Second trimester abortion in Viet Nam: Changing to recommended methods and improving service delivery," *Reproductive Health Matters* 16(31): 145–150.

Hull, Terence H. 2012. "Fertility in Southeast Asia," in Lindy Williams and Michael Philip Guest (eds.), *Demographic Change in Southeast Asia: Recent Histories and Future Directions*. Ithaca: Cornell Southeast Asia Program Publication, pp. 43–64.

James, William H. 2009. "The variations of human sex ratio during and after wars, and their potential explanations," *Journal of Theoretical Biology* 257: 116–123.

Jones, Stephen. 1997. "Georgia: The trauma of statehood," in Ian Bremmer and Ray Taras (eds.), *New States, New Politics: Building the Post-Soviet Nations*. Cambridge: Cambridge University Press.

Kaser, Karl. 2008. Patriarchy after patriarchy: gender relations in Turkey and in the Balkans, 1500–2000 (Vol. 7). LIT Verlag Münster.

Kashyap, Ridhi and Francisco Villavicencio. 2016. "The dynamics of son preference, technology diffusion, and fertility decline underlying distorted sex ratios at birth: A simulation approach." *Demography* 53(5): 1261–1281.

Kim, Hyune-Ju, Michael P. Fay, Eric J. Feuer, and Douglas N. Midthune. 2000. "Permutation tests for joinpoint regression with applications to cancer rates," *Statistics in Medicine* 19(3): 335–351.

King, Russell and Julie Vullnetari. 2012. "A population on the move: migration and gender relations in Albania," *Cambridge Journal of Regions, Economy and Society* 5(2): 207–220.

Kohler, Hans-Peter and Iliana Kohler. 2002. "Fertility decline in Russia in the early and mid 1990s: The role of economic uncertainty and labour market crises," *European Journal of Population* 18(3): 233–262.

Lerch, Mathias. 2013. "Fertility decline during Albania's societal crisis and its subsequent consolidation," *European Journal of Population* 29(2): 195–220.

Lesthaeghe, Ron and Camille Vanderhoeft. 2001. "Ready, willing, and able: A conceptualization of transition to new behavioral forms," in John B. Casterline (ed.), *Diffusion Processes and Fertility Transition: Selected Perspectives*. The National Academies Press, pp. 240–264.

Lin, Ming-Jen, Nancy Qian, and Jin-Tan Liu. 2008. *More Women Missing, Fewer Girls Dying: The Impact of Abortion on Sex Ratios at Birth and Excess Female Mortality in Taiwan* (No. w14541). National Bureau of Economic Research.

London, Jonathan D. 2013. "The promises and perils of hospital autonomy: Reform by decree in Viet Nam," *Social Science and Medicine* 96 (November): 232–240.

Mahoney, James. 2000. "Path dependence in historical sociology," *Theory and Society* 29(4): 507–548.

Mangalakova, Tanya. 2004. *The Kanun in Present-Day Albania, Kosovo, and Montenegro*. Sophia: International Center for Minority Studies and Intercultural Relations, p. 2.

Mars, Gerald and Yochanan Altman. 2008. "Managing in Soviet Georgia: An extreme example in comparative management," *European Journal of International Management* 2(1): 56–70.

Mathews, T. J. and Brady E. Hamilton. 2005, "Trend analysis of the sex ratio at birth in the United States," *National Vital Statistics Reports* 53(20): 1–17.

Michael, Marc, Lawrence King, Liang Guo, Martin McKee, Erica Richardson, and David Stuckler. 2013. "The mystery of missing female children in the Caucasus: An analysis of sex ratios by birth order," *International Perspectives on Sexual and Reproductive Health* 39(2): 97–102. https://www.guttmacher.org/es/about/journals/psrh/2013/07/mystery-missing-female-children-caucasus-analysis-rex-ratios-birth#17. Accessed 10/6/2016.

Ministry of Health. 1995. *Law on Interruption of Pregnancy*. Tirana.

Mosquera, Patricia M. Rodriguez, Antony S.R. Manstead, and Agneta H. Fischer. 2000. "The role of honor-related values in the elicitation, experience, and communication of pride, shame, and anger: Spain and the Netherlands compared." *Personality and Social Psychology Bulletin* 26(7): 833–844.

Muggeo, Vito. 2003. "Estimating regression models with unknown break-points." *Statistics in Medicine* 22(19): 3055–3071.

Ouellette, Nadine, Magali Barbieri, and John R. Wilmoth. 2014. "Period-based mortality change: Turning points in trends since 1950," *Population and Development Review* 40(1): 77–106.

Pham, Bang Nguyen, Wayne Hall, Peter S. Hill, and Chalapati Rao. 2008. "Analysis of socio-political and health practices influencing sex ratio at birth in Viet Nam," *Reproductive Health Matters* 16(32): 176–184

Pham, Bang Nguyen, Peter S. Hill, Wayne Hall, and Chalapati Rao. 2013. "The evolution of population policy in Viet Nam," *Asia-Pacific Population Journal* 27(2): 61–75.

Rahm, Laura. Forthcoming. "Policy convergence in the fight against sex selection: Insights from South Korea, India and Vietnam," *Critique Internationale*, 77.

Shapiro, David and Tesfayi Gebreselassie. 2013. "Fertility transition in sub-Saharan Africa: Falling and stalling," *African Population Studies* 23(1): 1–23.

Slider, Darrell. 1994. "Georgia," in Glenn E. Curtis (ed.), *Armenia, Azerbaijan, and Georgia Country Studies*. Washington DC: Federal Research Division. Library of Congress.

Socialist Republic of Vietnam. 2003. *2003 Population Ordinance* (No. 06/2003/PL-UBTVQH11). http://www.moj.gov.vn/vbpq/lists/vn%20bn%20php%20lut/view_detail.aspx?itemid= 21001#.

Spoorenberg, Thomas. 2015. "Explaining recent fertility increase in Central Asia," *Asian Population Studies* 11(2): 115–133.

Stecklov, Guy, Calogero Carletto, Carlo Azzarri, and Benjamin Davis. 2010. "Gender and migration from Albania" *Demography* 47(4): 935–961.

Tran, Hang. 2011. "Global debate, local dilemmas: sex-selective abortion in contemporary Vietnam," Ph.D. dissertation, Australian National University.

UNDP and INSTAT. 2013. *Domestic Violence in Albania—National Population Based Survey*. Tirana, Albania

UNFPA. 2012a. *Sex imbalances at Birth. Current Trends, Consequences and Policy Implications*. Bangkok.

———. 2012b. *Sex Imbalances at Birth in Albania*. Tirana.

———. 2015. *Gender-Biased Sex Selection in Georgia. Context, Evidence and Implications*. Tbilisi.

———. 2016. *Gender Bias in Kosovo*. Pristina.

United Nations. 2015, *World Population Prospects: The 2015 Revision*. New York.

Valente, Christine. 2014. "Access to abortion, investments in neonatal health, and sex-selection: Evidence from Nepal," *Journal of Development Economics* 107: 225–243.

Van Bavel, Jan and David S. Reher. 2013. "The baby boom and its causes: What we know and what we need to know," *Population and Development Review* 39(2): 257–288.

Vullnetari, Julie. 2007. "Albanian migration and development: state of the art review," IMISCOE Working Paper 18.

Wolf, Merrill, Thuy Phan Bich, Alyson Hyman, and Amanda Huber. 2010. "Abortion in Vietnam: History, culture and politics collide in the era of doi moi," in Andrea Whittaker (ed.), *Abortion in Asia: Local Dilemmas, Global Politics*. Berghahn Books, pp. 149–174.

World Bank. 1993. *Georgia: A Blueprint for Reforms*. Washington, DC: A World Bank Country Study.

———. 1999. *Georgia Poverty and Income Distribution*. Vol. 2. Technical Papers. No. 4. Georgia: A Qualitative Study of Impoverishment and Coping Strategies. Washington, DC.

———. 2007. *Albania—Urban Growth, Migration and Poverty Reduction: A Poverty Assessment*. Washington, DC.