Diffusion of Reproductive Health Behavior through International Migration: Effects on Origin-Country Fertility

Susan Godlonton*
Williams College

Caroline Theoharides
Amherst College

September 24, 2023

Abstract

International migrants may facilitate the transmission of ideas across countries. We examine the impact of migrant exposure to reproductive health policies on origin-country fertility in the Philippines. We exploit temporal variation in destination-country reproductive health policies combined with spatial variation across Philippine provinces in their migration intensity and historical composition of migrant destinations. Migrant exposure to more liberalized reproductive health policies reduces origin-community fertility. This reduction is driven by increased adoption of modern contraceptives and reduced reliance on traditional methods. Declines in fertility lead to intergenerational benefits for children, particularly declines in infant mortality.

Keywords: Migration, Reproductive Health, Fertility, Philippines

*We thank Esther Baek, Madeleine Elyze, Saisha Goboodun, Henry Lu, Daniel Page, and Zia Saylor for excellent research assistance. The project was primarily funded by the Research and Empirical Analysis on Labor Migration Group (REALM). We thank Michael Clemens, Jocelyn Finlay, Joshua Hyman, David McKenzie, Sarah Pearlman, Hillel Rapoport, and Dean Yang for their useful feedback. The paper has benefited from seminar participants at Ateneo de Manila University, the Center for Global Development, Stellenbosch University, Stockholm University, SUNY Binghampton, the University of Colorado Boulder, University of Innsbruck, University of Michigan, and Vassar College, and conference participants at the 15th International Conference on Migration and Development, the REALM consortium, Liberal Arts Colleges Development Conference (LACDev) 2019 and 2022, and the OECD International Forum on Migration Statistics.

1 Introduction

The exposure of international migrants to different cultural practices abroad influences their own knowledge, behavior, and preferences. Migrants may diffuse this new knowledge and these norms from their destination country to their origin communities, which in turn may impact economic development. Rapoport, Sardoschau and Silve (2020) find evidence of these "cultural remittances." In particular, exposure to destination country policies and attitudes through migration can affect voting patterns and political beliefs (Tuccio, Wahba and Hamdouch, 2019; Barsbai et al., 2017; Chauvet and Mercier, 2014; Batista and Vicente, 2011; Spilimbergo, 2009) as well as gender norms (Tuccio and Wahba, 2018; Dannecker, 2005) in the country of origin. Migration may also influence a host of other behaviors when differences between destination and origin communities exist. Fertility decisions are one such example, where the substantial variation in fertility rates and adoption of modern contraceptives across countries has the potential to diffuse through migration from the destination to the origin country. These decisions have consequences for development both at the micro (Joshi and Schultz, 2012) and macro level (Ashraf, Weil and Wilde, 2013). Thus, the transmission of different ideas and preferences surrounding fertility from the destination country may be an important channel through which migration impacts development in origin countries.

In this study, we examine the effect of exposure to destination-country reproductive health policies on fertility decisions in the country of origin. Specifically, we examine the effect of exposure to more openness surrounding reproductive health policies, as measured by fewer legal restrictions, on fertility and contraceptive use decisions in the migrants' origin communities in the Philippines. The breadth of destinations of Filipino migrants and the importance of migrant networks means that there is substantial variation in the exposure of Philippine localities to different reproductive health policies abroad. The Philippines has historically experienced a slow decline in fertility, generally believed to be due to limited promotion and use of modern contraceptive methods (Herrin, 2007). This institutional setting presents an opportunity for migrant exposure to more open reproductive health environments abroad to provide both new information and shape fertility behavior.

We exploit temporal variation in reproductive health policies in destination countries of temporary Filipino migrants and spatial variation in both province-level migrant networks and the overall intensity of migration. To do this, we expand upon a database of country-year reproductive health policies compiled by Finlay, Canning and Po (2012) in order to create a "liberalization index," which measures openness and access to reproductive health based on laws surrounding the pill,

condoms, IUD, sterilization, and abortion in each destination country. We create a shift-share style variable by assigning the destination-country liberalization indices (the shifters) to each Philippine province using the historical composition of migrant destination countries in that province (the shares). This results in a weighted measure of the destination liberalization indices for the province, which serves as a measure of exposure to reproductive health policies by migrants and their communities. For example, if a province has migrants who work in both Japan and Canada, that province's assigned liberalization index is the index for Japan and Canada, each weighted by the historical share of migrants moving to that destination from the province. To account for differences in overall historical migration rates across provinces, we interact our shift-share style variable with the historical density of migrants in the province. Therefore individuals who live in provinces with limited historical migration have less opportunity to be influenced by changes in the policies of destination countries, since migrants compose a smaller share of the province population.

Our effects are identified off changes in reproductive health policies in destination countries, holding constant the baseline rate of migration. Because we exploit changes in the liberalization index within a province over time, our identification strategy eliminates threats that certain provinces facilitate migration to more progressive destinations. Further, because we hold the rate of baseline migration constant, we eliminate the threat that any decline in fertility is simply due to the absence of individuals or separation of partners during migration episodes. We engage in a series of falsification exercises based on the new literature on shift shares (Borusyak, Hull and Jaravel, 2020; Goldsmith-Pinkham, Sorkin and Swift, 2020; Adao, Kolesar and Morales, 2019), and show that 1.) reproductive health policies in a destination are not correlated with the country's characteristics related to the composition of Filipino migrants, GDP, or the fertility rate; 2.) increased exposure to liberalized reproductive health policies is not generally correlated with baseline provincial characteristics; and 3.) pre-period birth rates are trending in parallel with respect to exposure to more liberalized reproductive health policies.

To create the historical destination composition and overall density of migrants for each province, we use a unique dataset that we compiled from the Philippine government that includes the origin and destination for all temporary migrants from the Philippines from 1992 through 2016. We link this province-year level dataset to panel data on fertility and contraceptive use, constructed from the Philippine Census and four waves of Demographic and Health Surveys for the Philippines.

We find that provinces exposed to more liberalized reproductive health policies experienced a decline in the fertility rate. A one standard deviation increase in exposure to more liberalized

policies led to a 0.95% decline in fertility when comparing provinces in the 75th percentile of baseline migration relative to the 25th percentile. The magnitude of these effects is large enough that the declines in fertility are not only due to migrant households but also due to the spillover of information to non-migrant households. A key advantage of our approach is that since we are identifying our effects based on changes in reproductive health policy at the destination, it is unlikely that increased income due to migration drives the declines in fertility that we find. For income to explain our results, a destination country experiencing a change in reproductive health policy must simultaneously experience an increase in wages. Nevertheless, we address this potential threat by including a control for annual median migrant income in the province. The results are essentially unchanged and so we conclude that increased income due to migration does not seem to cause the decline in fertility.

We also explore whether the exposure of particular types of migrants to more liberalized reproductive health policy drives the declines in fertility that we find. First, we explore whether province fertility rates are more sensitive to the exposure of male or female migrants to more liberalized policies. To do this, we create new gender-specific versions of both the shift-share style variable based on provincial destination composition and the overall migration intensity. Exposure of both female and male migrants leads to declines in fertility, but female migrant exposure to more liberalized policies leads to fertility declines that are approximately three times larger than those due to male migrant exposure. Second, because Filipino migrants work in a wide range of occupations, our study also allows us to explore the importance of exposure to reproductive health policies of different occupation groups. In particular, domestic helpers, the top occupation for female migrants, differ significantly from other occupations in their housing and social networks while abroad. We find that fertility declines more when female domestic helpers are exposed to liberalized policies relative to female non-domestic helper migrants.

Women change their contraceptive behavior to achieve these fertility declines. We document substantial switching from traditional contraceptive methods to modern contraceptive methods, particularly to the pill and injectables. Women report the desire for more effective methods as a reason for switching from traditional to modern methods. Given the greater efficacy of modern relative to traditional methods, this switch is large enough to explain the declines in fertility that we find.

Declines in fertility have important implications for the well-being of children (see Schultz (2007), Strauss and Thomas (1995), and Schultz (1993) for a review). Given the declines in fertility

that we find, we next examine the potential for economic impacts on children in our setting. We find evidence that children are better off as a result of increased exposure to liberalized reproductive health policies in their province. Infant mortality declines by 0.84 deaths per 1,000 births in response to a one standard deviation increase in exposure, when comparing across the interquartile range of baseline migration. We also find suggestive evidence of declines in maternal mortality and child labor and increases in grade for age.

Our paper contributes to three literatures in economics. First, it builds on a growing literature studying the transmission of destination country behavior and preferences to migrant origin countries (Tuccio, Wahba and Hamdouch, 2019; Tuccio and Wahba, 2018; Barsbai et al., 2017; Chauvet and Mercier, 2014; Batista and Vicente, 2011; Spilimbergo, 2009; Dannecker, 2005). Specifically, our paper is related to the literature on the effects of migration on origin-country fertility. Much of this literature, which spans economics, sociology, and demography, estimates the effects of migration on fertility by comparing migrants to non-migrants or areas with more migration to areas with less migration.[1]

Other recent work addresses the endogenous nature of the migration decision and instead compares the fertility outcomes of migrants going to different destinations. For instance, Fargues (2011) compares the fertility outcomes of migrants from Morocco and Turkey, where migrants go to Western countries, to those of migrants from Egypt, where migrants typically migrate to the Gulf. Beine, Docquier and Schiff (2013) use cross-country data on aggregate migrant flows and origin-country fertility rates and find declines in fertility, which they attribute to changes in norms. To examine convergence in fertility rates in 19th century France, Daudin, Franck and Rapoport (2019) estimate the effect of fertility norms of internal migrants (measured following Spilimbergo (2009) as the fertility rates in the origin and destination departments) on fertility, instrumenting for these norms with railroad networks.

We build upon the identification strategies used in these previous papers by exploiting changes in reproductive health policy in destination countries, creating an exposure measure based on the historical destination composition of migrants across provinces in the Philippines. By exploiting

[1]For example, Lindstrom and Saucedo (2002) show that migrants from Mexico to the U.S. modify their fertility behavior while abroad relative to non-migrants and maintain this behavior upon their return to Mexico. Hildebrandt and McKenzie (2005) also show that fertility behavior is diffused back to Mexico. Bertoli and Marchetta (2015) compare the fertility rates in Egypt of households with men returning from work in high birth rate Arab countries to households without a return migrant, finding that households with return migrants have a higher number of children per woman, which is in line with the higher fertility rates in the destination countries of these workers. In the case of the Philippines, Jensen and Ahlburg (2004) find declines in fertility in the Philippines when comparing households with internal migrants relative to those without migrants.

variation in reproductive health policy changes at destination, we reduce concerns about the endogenous nature of selection into migration overall and to specific destinations. Further, since we rely on changes in reproductive health policy within each destination country for identification, we are able to isolate the behavioral change in fertility as a result of exposure to liberalized reproductive health policy from an income effect. We also examine the effect of exposure to reproductive health policies on the entire community rather than focusing on the effects on migrant relative to non-migrant households. If, as we find in this paper, knowledge about reproductive health is diffused in the community beyond the migrants themselves, then comparing migrants to non-migrants will result in an underestimate of these effects. Combining our unique identification strategy with the rich administrative migration data and the Philippine DHS allows us to further expand upon these previous studies and explore the mechanisms driving the changes in fertility more directly, namely contraceptive use and reasons for adoption.

Second, our paper contributes to the literature examining the effects on fertility of increased exposure to reproductive health messaging, either through media such as soap operas (Ferrara, Chong and Duryea, 2012), MTV (Kearney and Levine, 2015), cable tv access (Jensen and Oster, 2017), and radio advertisements about contraceptives (Glennerster, Murray and Pouliquen, 2021) or through exposure to leaders such as the pope (Bassi and Rasul, 2017). These studies are similar to our work in that they are not about the direct provision of contraceptives, but rather about exposing women to new norms surrounding reproductive health behavior. Our study is unique in that it examines this diffusion of knowledge about reproductive health behavior through migrant networks.

Third, our paper broadly contributes to the literature on the effects of migration on origin countries by documenting the behavioral changes that can result due to migration, as well as the intergenerational effects of migration on children.[2] Finally, our paper contributes to the literature on cultural change (Nunn, 2022), particularly in terms of thinking about transmission of values and beliefs. We show that exposure to reproductive health policy through migration has the potential to modify origin-community reproductive health behaviors.

[2]This rich literature finds that migration can lead to a number of impacts on origin countries, such as income gains (Clemens, Montenegro and Pritchett, 2019), increased household investment (Woodruff and Zenteno, 2007; Yang, 2008), changes in education (Cox-Edwards and Ureta, 2003; Dinkelman and Mariotti, 2016; Theoharides, 2018; Abarcar and Theoharides, 2021), reductions in risk (Yang and Choi, 2007), changes in employment (Caballero, Cadena and Kovak, 2023), and increased long-run economic development (Khanna et al., 2021).

2 Background

2.1 Migration from the Philippines

The facilitation of international migration, particularly of temporary or circular migration, is a key development strategy for many developing countries globally. Khanna et al. (2021) use data from the U.N. to determine that 88% of developing countries with a population of at least 1 million have a government agency dedicated to overseas employment, citizens abroad, or diaspora engagement. For instance, Bangladesh, Sri Lanka, the state of Kerala in India, and the Philippines all have government agencies or bureaus dedicated to the facilitation of labor migration as part of their development plans. In the case of the Philippines, the facilitation of temporary contract migration commenced in 1974 in response to poor economic conditions at home. This migration is largely legal, and workers are matched with employers through licensed recruitment agencies.

The Philippines is one of the largest origin countries for migrants globally, with approximately 2% of the Philippine population migrating each year. Filipinos migrate on temporary contracts to a diverse set of destination countries globally. These destination countries include numerous countries in the Middle East and Asia, but also the United States, Canada, and the European Union. Migrant networks are a key driver of destination country choice for migrants globally (Munshi, 2003). In the Philippines, these migrant networks, as measured by the historical destination composition of provinces, are a good predictor of where migrants from those provinces move today (Theoharides, 2018). Temporary migrants from the Philippines also work in a range of occupations across skill levels, from domestic helpers and laborers to nurses and engineers.

The average contract duration of these migrants is approximately 24 months. If the migrant does not renew their contract or initiate a new contract, they return home to the Philippines at the conclusion of their contract. If they do renew their contract, they typically return for an extended period between contracts. As a result, temporary contract migration links the country of destination and origin communities more closely than permanent migration, which often involves migrating with one's family as well.

2.2 Reproductive Health in the Philippines

Globally, fertility has declined consistently over the last several decades. This general pattern is also true in the Philippines. Since the 1970s, when the government committed to reducing family size (Herrin, 2007), fertility has steadily fallen (NSO et al., 1999; NSO and ORC, 2004; NSO and

ICF, 2009; PSA and ICF, 2014). However, relative to its neighbors, the Philippines experienced slower fertility declines, resulting in persistently higher fertility rates than Southeast Asia as a whole. The overall decline in fertility in the Philippines hides considerable regional variation: both the level of fertility and the pace of the decline in fertility have not been equal across regions.

Much of the fertility decline has been attributed to increased contraceptive use which has risen over the last several decades. The Philippines is a predominantly Catholic country, and contraceptive use has been widely influenced by Catholic values regarding contraception promotion and use. Despite this, contraceptive adoption has steadily increased. The largest gains in contraceptive adoption occurred between 1970 and 1998, which witnessed a tripling in the proportion of women using contraception. Within our sample period, contraceptive adoption increased at a slower overall pace, moving from 32 percent in 1994 to 55 percent in 2013. Despite these gains, unwanted pregnancies remain high, and the reported unmet need for contraception in 2013 was 18 percent. Among women using family planning methods, there has also been a shift toward modern contraceptive methods, resulting in a 30 percent (or 8 percentage point) increase in the use of such methods between 1993 and 2003.[3] Among modern methods, sterilization was the most common method used by women at the beginning of our period of interest, but by the end of our sample period, the pill had become the most common method.

3 Data

We assemble several different data sources, combining administrative and secondary data with information on the timing of policy adoption, to create a unique new database for our analysis.

Measuring both the intensity of migration and the destination composition of migrants from each Philippine province is crucial to implementing our shift-share identification strategy. To do this, we use a unique database on all temporary contract migrants from the Philippines which includes both the province of origin and country of destination for each migrant. This allows us to measure the flow of migrants across various migration channels. We obtained these data from the Philippine Overseas Employment Administration (POEA) and the Overseas Worker Welfare Administration (OWWA). The database covers all outflows of migrants on new, temporary work contracts from the Philippines from 1992 through 2016.[4] The POEA/OWWA data also include

[3] Modern contraceptive methods include the pill, IUD, injectables, condoms, and sterilization, while traditional contraceptive methods include periodic abstinence, ovulation, basal body temperature, symptothermal methods, breastfeeding, withdrawal, and herbal medicines.

[4] POEA is tasked with making sure workers' contracts meet the minimum wage required by the Philippine gov-

the gender and occupation of the migrant, allowing us to examine disaggregated country-specific migrant flows.

We use the first year of data, 1992, to create measures of both the intensity and destination composition of migration. We measure intensity by aggregating the total number of migrants in each province and dividing by the province population, which we obtain from the Philippine Census of Population. Table 1 indicates that the average province has approximately 2.2 migrants per 1,000 residents. This average masks considerable variation in the intensity of temporary migration: the top decile of provinces has 8.7 migrants per 1,000 residents, while the bottom decile has less than 1 migrant per 1,000 residents.

The composition of migrant destinations varies substantially across the 84 provinces in the Philippines and provides key variation for our identification strategy. In order to create a measure of exposure to reproductive health policies at destination through migration, we create measures of the destination composition of each province in the Philippines at baseline (1992) by calculating the share of temporary migrants going to each destination country out of the total temporary migrants from the province. The average province has migrants in 24.3 different destinations at baseline. On average, the largest destination comprises 50.7 percent of migrant flows from that province, with this share ranging across provinces from 24.6 to 100 percent of migrant flows. To further illustrate the importance of various destination countries for Filipino migration, we show the average baseline number of migrants per 1,000 residents for the top 20 destinations of Filipino migrants in Table 1, Panel B. These top 20 destinations are largely in the Middle East or Asia. The average province has approximately 1 migrant to Saudi Arabia per 1,000 residents compared to 0.26 migrants to Japan per 1,000 residents, the second most important destination country in 1992.[5]

To measure reproductive health policies in the destination countries of temporary migrants from the Philippines, we adapt a dataset compiled by Finlay, Canning and Po (2012). They construct

ernment. To do this, they collect detailed data on demographics, occupation, wages, and destination country for all Filipino migrants. OWWA monitors the welfare of migrants and their families in the Philippines. They collect similar demographic data to POEA, but also collect detailed data on the location of origin in the Philippines for each migrant. For the data from 1992 to 2009, we matched the POEA and OWWA data in order to create a dataset that includes both the destination and home address of each migrant from the Philippines. The data are matched on first name, middle name, last name, date of birth, destination country, gender, and year of departure using fuzzy matching techniques (Winkler, 2004). See Theoharides (2018) for more details. Starting in 2010, POEA also recorded the location of origin of the migrants so we did not need to use these matching techniques in the 2010 to 2016 data.

[5]The ranking of destinations is determined by the total number of migrants departing the Philippines for a given destination at baseline (1992). This ranking is not necessarily the same as the ranking that would result if we ranked destinations by the average baseline migrants per thousand across provinces, since the variance of this variable varies substantially across provinces by destination. This is why, for instance, Kuwait has more migrants overall than Bahrain, but a lower average of migrants per 1,000 across provinces.

decade-specific reproductive health policy indices based on the prevailing reproductive health laws in 186 countries. Separate indices are available for abortion, condom, pill, IUD, and sterilization laws. For each index, a set of criteria is defined against which the policies of each country are scored. An example of the pill scoring mechanism is presented in Figure 1. Using this score card, if a country introduces a new reproductive health act that legalizes commercial advertising of the pill without any restrictions from an original policy regime of advertising being illegal, the pill index would increase by 3 points. For each sub-index, the Finlay, Canning and Po (2012) measure is defined as the number of points a country receives divided by the total possible number of points. So, in our example, the pill advertising change would increase the percent of maximum liberalization for the pill by 25 percentage points.[6] Maximum liberalization is attained by scoring the full number of points for the sub-index. For our purposes, to construct a composite reproductive health policy liberalization index by country, we standardize each sub-index and average the five standardized sub-indices. This implicitly weights the policy environments for abortion, condom, pill, IUD, and sterilization equally.[7]

Some details regarding the coding of policies are important to highlight. First, Finlay, Canning and Po (2012) code decade-specific policies, obscuring some of the underlying variation. To address this, we undertake our own review of the policies, relying heavily on the sources referenced by Finlay, Canning and Po (2012), to determine the precise year in which a policy changed. Appendix A details this process and our reasoning for the specific year selected based on our review of the policies. We link these country-specific liberalization indices to the POEA/OWWA migrant flow database at the country-year level. Second, for all territories, we assign the policy index values of the governing country. For instance, the Commonwealth of the Northern Mariana Islands is an unincorporated territory of the United States and is thus assigned the policy index value for the United States. We test the robustness of this assumption in Section 8 and find that the results are robust.

Table 2 examines the underlying variation in the policy changes which underpin our identification strategy. In our sample period, approximately 42% of the countries experience at least one change in their reproductive health policies based on this scoring algorithm. Panel A shows that pill and condom-related policies are the most likely to experience changes during our sample

[6]The maximum possible score for the pill is 12 points, thus an increase of 3 points translates into a 25 percentage point increase.

[7]To address missing sub-indices we take two approaches. In our main results, we omit that particular sub-index and aggregate across the other four. As a robustness check, we instead assume it to be zero and include it in the index. Results are robust to the method used (see Section 8).

period. A total of 22.4% and 21.2% of countries change pill or condom policies during this time, with an (unconditional) average number of changes of 0.42 and 0.38 for pill and condom policies respectively. Many of the pill and condom changes happen simultaneously as countries implement or adjust subsidies or change their policies related to the marketing of both of these family planning options.[8]

Table 2, Panel B presents summary statistics of the sub-indices and the overall standardized liberalization index for our estimation sample. Based on the scoring algorithm, sterilization policies are considered the most liberalized with a score of 86.5% of maximum liberalization, while abortion policies are considered the least liberalized, scoring only 58.9% of maximum liberalization.

Our primary outcome of interest is fertility. We measure births using the 1995, 2000, 2007, 2010, and 2015 100% Philippine Census of Population. Using the age of the child, we determine the number of births occurring in each province-year. We then construct the birth rate for each province by dividing the number of births by the population of women aged 15 to 49 in that year. For example, to calculate the birth rate in 2010, we count the number of children less than one year old in 2010 and divide by the number of women age 15 to 49. To calculate the number of births in 2008, we calculate the number of children that are age 2 in the 2010 Census and divide by the population aged 17 to 51 in the 2010 Census, since these women would have been ages 15 to 49 in 2008. We retrospectively fill in gaps between Census years in order to create a panel of births from 1994 to 2013. Appendix Table A2, Panel A indicates an annual birth rate of approximately 100 births per 1,000 women of child-bearing age across Census waves.

In order to explore the mechanisms underlying fertility decisions, we use the Philippine Demographic and Health Survey (PDHS) to construct contraceptive use outcomes. The PDHS is a comprehensive national survey of women aged 15 to 49, and relative to the Census, provides a much richer set of reproductive health outcomes. To explore contraceptive behavior, we use the detailed five-year retrospective history of current contraceptive use, available in the 1998 and 2003 survey rounds. Thus, the resulting contraceptive use sample spans the period 1994 through 2003. Just less than one-third of the sample report using any contraceptive method in a particular year, which is fairly evenly split between modern and traditional contraceptive methods (Appendix Table A2).[9] Among modern contraceptive methods, the pill is by far the most commonly used method, with 7.7% of women using the pill in any particular year. Other modern methods of choice include

[8]We also decompose the underlying variation in components of the indices. Appendix Table A1 shows this disaggregated variation for the pill and condoms. Changes to commercial advertising are the most prevalent.

[9]See footnote 3 for a breakdown of modern and traditional methods.

sterilization (5.7%) and IUDs (2.6%). These descriptive findings are consistent with previous literature in the Philippines that document a strong preference for the pill and sterilization (PSA and ICF, 2014; NSO and ICF, 2009; NSO and ORC, 2004; NSO et al., 1999). Younger women typically adopt the pill to control birth spacing while sterilization is more common among older women and used to limit the number of births (Laguna, Po and Perez, 2000). Women adopting injectable contraception tend to be married and also the most informed about the potential side effects and efficacy of their selected family planning method (NSO and ORC, 2004).

To combine these various data sources, we first use the destination composition at baseline to match each province with the annual destination country reproductive health policy data expanded from Finlay, Canning and Po (2012). This allows us to create a province-year level panel which assigns the reproductive health policies that a province is exposed to through migration based on the province's baseline destinations. We combine this province-year level dataset with the province-year level outcomes data from Census and PDHS, using consistent definitions of geographic boundaries over time and across datasets in defining provinces.[10] For our main fertility outcome, this yields a province-year panel with 84 provinces from 1994 through 2013.

4 Empirical Strategy

To examine the impact of exposure to more liberalized reproductive health policies during temporary migration episodes on origin country reproductive health behavior, we exploit temporal variation in destination country reproductive health policies and spatial variation in both province-level migrant networks and intensity of migration. We use these components to create what we refer to as the "weighted liberalization index," which is essentially a shift-share style variable. Our shares reflect the destination composition of each province and are defined as the fraction of migrants going to each destination divided by the total number of migrants. Because contemporaneous values of these shares could be affected by changes in the fertility rate due to the liberalization of reproductive health policies, we define our exposure measure, or shares, in a base year, 1992. Given the persistence of migrant networks across time (Munshi, 2003), including in the Philippines (Theoharides, 2018), base migration shares are a reasonable predictor of future migrant destination composition in the province. Our shifters are the reproductive health policies in each destination country, aggregated into a liberalization index as defined in Section 3.

[10] Provinces are defined based on geographic boundaries in 2010.

The destination composition of a province determines whether that province is more or less exposed to policy changes in destination countries. A province with, for instance, 25% of migrants in Qatar will be relatively more exposed to reproductive health policy variation in Qatar than a province with only 5% of migrants in Qatar. To calculate our shift-share measure of reproductive health policies in migrant destinations, the liberalization index in each destination d year t is multiplied by the baseline migration rate (1992) between province p and destination d. We then sum over all destinations d in order to calculate a weighted measure of policy exposure in province p year t. This shift-share style variable creates a measure of exposure to liberalization for each province:

$$WeightedLiberalizationIndex_{pt} = \sum_{d} (MigRate_{pd0} * LibIndex_{dt}) \tag{1}$$

We then interact our shift-share variable, the weighted liberalization index, with the total baseline rate of migration from the province out of the total province population. If two provinces have the same composition of migrant destinations, but in one 5% of the population migrates, while in the other 1% migrates, the province with the larger portion of its population migrating will have more exposure to reproductive health policy at destination. Like the exposure shares used in equation (1), we use the province's baseline migration rate, rather than the contemporaneous migration rate, due to potential concerns about endogeneity of the contemporaneous values.

Due to the weighting of the policy variation by the destination composition at baseline, some policy changes contribute more to our underlying variation than others. That is, policy changes in destination countries that receive more migrants, as well those that receive migrants from many provinces, contribute more to our underlying variation. To intuitively understand our identifying variation, consider a policy change in 1999 where Japan approved use of the pill for contraceptive purposes, increasing the pill specific index by 8.33 percentage points. Japan is also one of the top 10 destination countries in our base year (1992), and so this change influences many provinces but to varying degrees. To see the difference at the province level, consider two provinces: Zambales and neighboring province Bataan. Both have very similar baseline shares of the population working as temporary migrants, 0.67 and 0.66 percent respectively. However, they exhibit vastly different patterns in where migrants work: 11.6 percent of all temporary migrants in Zambales are based in Japan in 1992, versus 3.8 percent in Bataan. Thus, the pill policy change will have a larger effect in Zambales as compared to Bataan. Our identification relies on these differences to identify the causal impact of exposure to more liberalized reproductive health policies.

Turning to Table 2, Panel C, 90% of provinces in the Philippines experience a change in their weighted liberalization index in at least one year. Across provinces, the number of changes varies considerably from zero to 44 changes in a province in a specific year. In any particular year, countries often overhaul many reproductive health policies at the same time and thus may have multiple changes in a single year. On average, the weighted change in the index for a province is 7.26 index points. This indicates that the average policy change shifts toward more liberalized policies, although we do observe both positive and negative changes in liberalization. The share of the population working as a temporary migrant in our base year also varies across provinces, ranging from approximately 0% to 1.5% (Table 2, Panel D).[11] Figure 2 shows the underlying geographical variation in the total change in policy exposure by province over our sample period.

Leveraging this underlying variation, we estimate the following regression equation:

$$\begin{aligned} Y_{pt} = {} & \beta_0 + \beta_1 WeightedLibIndex_{p,t-2} + \beta_2 MigRate_{p,t=0} XWeightedLibIndex_{p,t-2} \\ & + \delta_p + \tau_t + \delta_p Xtime_t + \epsilon_{pt} \end{aligned} \tag{2}$$

where Y_{pt} is the fertility rate in province p, in year t, defined as the number of births in a given year divided by the total number of women aged 15-49. $WeightedLibIndex_{p,t-2}$ is the weighted liberalization index in the woman's province, which we standardize to have a mean of zero and a standard deviation of one. A larger value means the province was exposed to more liberalized reproductive health policies due to temporary migration. We lag this by two years as typical contracts for temporary migrants are two years in length. $MigRate_{p,t=0}$ is the base year migration rate (1992) for the province, where the migration rate is defined as the number of migrants in 1992 divided by the province population as calculated in the 1990 Philippine Census. Finally, $MigRate_{p,t=0} XWeightedLibIndex_{p,t=2}$ is the interaction of the baseline migration rate and the weighted liberalization index. We refer to this term as the "policy exposure." Our primary coefficient of interest is β_2.[12] The sample period for the main fertility results is from 1994 through 2013.[13]

[11] To get a sense of the variation in the weighted liberalization index over time, we use a Fourier decomposition to filter the variation into high and low frequency components following Baker, Benjamin and Stanger (1999) and Bound and Turner (2006). Using 22 years of data (1992-2013), we divide the weighted liberalization index into 11 orthogonal components of different frequencies. The overwhelming majority of the variation is in the low frequency range. Seventy-seven percent of the variation occurs in the three lowest frequency components. These frequencies correspond to cycles of 22, 11, and 6 years. This suggests that changes in the liberalization index are quite stable and persistent.

[12] Note the main effect of $MigRate_{p,t=0}$ is absorbed in the province fixed effects.

[13] The first year of the POEA/OWWA migration data is 1992. Because of the two year lag for the liberalization index, which uses the 1992 destination composition in its creation, our analysis sample begins in 1994.

We include province (δ_p) and year of birth (τ_t) fixed effects as well as province-specific linear time trends ($\delta_p X time_t$). By including province fixed effects, we account for any time-invariant province-specific characteristics.[14] Importantly, this accounts for differences in the baseline rate of migration across provinces, so we compare provinces that have identical aggregate migration rates at baseline, but experience different changes in exposure to reproductive health policy due to their destination composition. By including year fixed effects, we control for any countrywide year-specific impacts on fertility, such as a countrywide natural disaster or changes to national health policies that unilaterally affect the Philippines. Further, by including province-specific time trends, we allow for fertility to trend differentially across provinces. For instance, if a particular province experiences increases in the availability of healthcare and that is correlated with the destination choices of migrants from that province, we could wrongly attribute reduced fertility to exposure to more liberalized reproductive health polices, rather than to the better health care options in the province. We remove these concerns from our identifying variation through the inclusion of the province-specific linear time trends. Our standard errors are clustered at the province level.

Our effects are identified off changes in exposure to reproductive health policies at destination. Our main identifying assumption is that in the absence of reproductive health policy changes at destination, fertility in provinces in the Philippines with different destination compositions, but the same baseline migration rates, would have evolved similarly.[15] Two threats to identification could occur. First, conditional on the same level of migration, provinces that have migrants in destinations that adopt more liberal reproductive health policies may trend differentially to provinces that do not. Second, other types of policies, either province- or destination-specific, may change simultaneously with the reproductive health policies that compose our weighted liberalization index. For example, if countries are adopting less restrictive reproductive health policies and more labor friendly policies, such as increased wages, then changes in reproductive health outcomes may be due to increased migrant income, rather than reproductive liberalization. We rigorously test for the validity of these assumptions below. Importantly, our identification strategy means that any

[14] Note that while the sum of exposure shares is not equal to one, because the shares are assigned at baseline and are not time-varying, the inclusion of province fixed effects controls for the missing shares as suggested by Borusyak, Hull and Jaravel (2020).

[15] Another way to think about our identifying assumption is that in the absence of the policy changes, fertility in provinces with different baseline migration rates, but the same destination composition, would have evolved similarly. However, in our context, most of the variation comes from differences in destination composition, so we phrase our identifying assumption accordingly. The standard deviation in baseline migration rates is 0.0027 compared to the standard deviation in the baseline share of migration to the top destination country of 0.139. The number of destinations where provinces have migrants varies from 1 to 64 countries, and the concentration ratio of the top 20 destinations at the province level varies from 0.16 to 1.

changes in fertility that we find are not simply due to the absence of individuals who are abroad since we compare areas with the same rates of migration, but rather are due to different exposure to reproductive health policies. Thus, any difference in effects on fertility is due to the liberalization of these policies across two areas with the same base migration rates.

A recent literature engages with the necessary assumptions when using a shift-share variable and provides detailed checks for the validity of this approach (Goldsmith-Pinkham, Sorkin and Swift, 2020; Borusyak, Hull and Jaravel, 2020; Adao, Kolesar and Morales, 2019). This literature requires the assumption of either exogenous shares (Goldsmith-Pinkham, Sorkin and Swift, 2020) or exogenous shocks/shifters (Borusyak, Hull and Jaravel, 2020). We do not claim that the shares, $MigRate_{pd0}$, are exogenous, but rather assume exogeneity of the shocks, $LibIndex_{dt}$. Because the reproductive health policies are determined in the destination countries of Filipino migrants, the assumption of exogenous shocks seems more plausible than in many other shift-share settings since it seems unlikely that conditions in the province influence reproductive health policy in destination countries. However, we follow Borusyak, Hull and Jaravel (2020) and conduct a number of falsification checks to ensure the validity of our strategy.

First, we address concerns about the randomness of the destination-country reproductive health policies. Our analysis does not require the strict assumption that the liberalization of reproductive health policies is unrelated to destination characteristics. Rather, it requires that the liberalization of reproductive health policies is unrelated to destination characteristics that may influence the migration of Filipinos to that destination, and thus their subsequent fertility. In other words, nothing else should be changing in the destination country that is correlated with fertility behavior in the Philippine provinces. The most likely candidates for these sorts of omitted variables are destination country-specific attributes that have the potential to influence the composition of Filipino migration. For instance, destinations adopting more liberal reproductive health policies might also be increasing their openness to migrants, which could provide more opportunities for migration and thus increased migrant income. This could lead to potential bias for provinces that have migrant networks to that destination, since we would not know if the decline in births is due to the liberalization of reproductive health policy or changing openness to migrants.

To check for balance, we follow Borusyak, Hull and Jaravel (2020) and conduct a falsification exercise where we regress the destination-level controls on the destination-level liberalization index and year fixed effects. Regressions are weighted by the average destination exposure share across provinces, or in other words, the average share of Filipino migrants across provinces to a particular

destination (Borusyak, Hull and Jaravel, 2020).

We examine numerous destination characteristics related to the composition of Filipino migrants in the destination: the share of Filipino migrants to the destination out of the total number of Filipino migrants, the share of domestic workers to the destination, the share of female migrants to the destination, and the share of remittances coming from that destination to the Philippines. Imbalance on these migration related variables could suggest simultaneous changes in migration or labor policy at the destination that might be correlated with fertility in provinces with strong migrant networks to these destinations. We also examine both real GDP and the fertility rate in the destination. Real GDP captures a measure of wealth for the destination. If changes in reproductive health policy are correlated with GDP, simultaneous changes in destination wealth may cause changes in fertility in origin areas through an income effect, rather than the reproductive health policies. Finally, if contemporaneous changes in the fertility rate are correlated with changes in reproductive health policy, one might be worried that the policy changes are due to a shift in long-run fertility behavior in the destination. We want to identify our effects off changes in destination country reproductive health policies, not changing trends in their fertility patterns.

The results of this falsification exercise are shown in Table 3. In all cases, there is not a statistically significant relationship at conventional levels between the destination's liberalization index and characteristics. These results suggest that changes in a country's reproductive health policies are not correlated with the country's characteristics, and are essentially as good as randomly assigned. Though these results suggest balance across destination countries with differing liberalization indices, we follow Borusyak, Hull and Jaravel (2020) and include these destination-level controls in all regressions. To do this, we create province-level measures by aggregating the destination-level controls based on the 1992 exposure weights used in the construction of the weighted liberalization index.

Second, we follow Borusyak, Hull and Jaravel (2020) and examine province-level balance. We replace our outcomes of interest in Equation (2) with pre-period province-level characteristics measured using the 1990 Philippine Census of Population.[16] We include the male-female ratio, the share of the population with a secondary education, the share Catholic, the share urban, and an asset index.[17] These variables reflect the broad demographics of the province, including demographics

[16]Because these outcomes are not time-varying, we can no longer include province fixed effects due to collinearity, and so we include $MigRate_{p,t=0}$ instead.

[17]The asset index is comprised of the following assets and calculated using principal component analysis: owns home, refrigerator, radio, tv, land, has electricity, running water, telephone, high quality cooking fuel, trash collection, and high-quality wall and roof materials.

that may be related to fertility decisions, such as sex ratios, education, religion, and wealth. We also explicitly examine balance in province-level fertility by examining the birth rate in 1990 and the change in the birth rate between 1985 and 1990. Turning to Table 3, Panel B, an increase in exposure to the liberalization of reproductive health policy is not correlated with baseline provincial characteristics, except in two cases. Provinces experiencing greater exposure to changes in reproductive health policy are marginally wealthier and have lower birth rates in 1990. Overall, these results suggest pre-period balance for provinces vis-a-vis changes in reproductive health policies. Nevertheless, province-level fixed effects and province-specific linear time trends account for differences in levels or trends related to these baseline variables.

Finally, in Panel C of Table 3, we conduct an explicit check for pre-trends. We limit our sample to the pre-period (1985 to 1990) and regress the birth rate on the change in the policy exposure between 1992 and 2013 (i.e. change in $MigRate_{p,t=0}XWeightedLibIndex_{p,t=2}$), a linear variable equal to the year, and the interaction of these two variables, as well as province fixed effects. The interaction variable is our main variable of interest and tells us whether provinces experiencing large changes in exposure to liberalization are trending differentially from provinces experiencing smaller changes in exposure to reproductive health policy. We are unable to reject the null hypothesis that birth rates are trending in parallel in the pre-period. This alleviates the concern that provinces with varied exposure to destination country reproductive health policy changes are trending differentially.

5 Effects on Fertility

The opportunity for exposure to different reproductive health policies through temporary migration has the potential to shift the behavior of women in origin communities. For example, such exposure provides opportunities to learn about new contraceptive technologies which can help women limit their fertility if desired, particularly in settings with high unmet need for contraceptives. We first examine the effect of exposure to more liberalized reproductive health policies at destination on fertility in the Philippines. We measure fertility using the Philippine Census and present the results in Table 4. To interpret the results, consider moving from a province with a baseline migration rate of zero to a province where 10% of the population migrates. A one-standard deviation increase in exposure to liberalized reproductive health policies yields a 5.03 percentage point decline in the fertility rate. Of course, moving from a migration rate of zero to 10% is unrealistic, so we

scale the results by the interquartile range of the baseline temporary migration rate. For the 25th percentile, 0.056% of the province population migrates compared to 0.31% for the 75th percentile, or a difference of 0.25% of the province population. Considering two provinces with a population of 100,000, this would represent an increase of about 250 migrants.

Scaling our results, as we move from the 25th percentile of baseline migration to the 75th percentage, a 1 standard deviation increase in exposure to more liberal policies yields a 0.13 percentage point (-0.503*0.0025*100), or 0.95% decline in fertility.[18] The inclusion of province fixed effects means that our effects are identified off changes in liberalization among destination countries, not differences in the level of baseline migration rate across provinces. The effect of exposure to liberalized policy has a statistically significant effect on fertility.

Are these declines in fertility driven exclusively by women who themselves migrate, or are there spillovers to non-migrants? These spillovers could occur if, for instance, non-migrants have conversations with those exposed and thus alter their own fertility behavior in response. Unfortunately, we cannot observe a woman's own migration history in either the Census or DHS, limiting direct measurement of the contribution of each of these groups to the total effect. However, we can identify households with migrants in two Census waves. Using a back-of-the-envelope calculation, it is clear that the fertility declines we observe cannot solely be driven by households with temporary migrants. In the 2000 Census, 0.95% of women aged 15 to 49 lived in households with a migrant in the last 5 years (either the woman herself or another household member).[19] If fertility fell by 50% among women in households with migrant exposure within the home, this would only explain about 2% of the overall reduction in fertility. Even if the share of women residing in households with direct migrant exposure was 10%, rather than 0.95%, then the same sized fertility reduction among these women would still only account for 20% of the total effect. Thus, our effect sizes must encompass a fertility response by both women in migrant and non-migrant households.

One potential concern about our estimates is that temporary migration generally leads to increases in income for households in the migrant's location of origin (Khanna et al., 2021). One advantage of our identification strategy relative to previous papers examining the effect of migration on fertility is that we identify our effects based on changes in reproductive health policy at destination. Previous studies have often relied on comparing migrant households to non-migrant households or migrants to certain destinations relative to migrants to other destinations. In both

[18] While exploring asymmetric responses to positive versus negative shocks would be interesting, few province-year observations experience an aggregate negative shock, making it difficult to identify the effects.

[19] This is the earliest year of the Census containing this information.

cases, differences in migrant incomes may drive declines in fertility, rather than behavior change due to exposure at destination. For income to explain our results, a destination country experiencing a change in reproductive health policy must simultaneously experience increases in wages, perhaps through some sort of migration reform as discussed in Section 4.[20] While this seems like a less plausible threat than the scenarios in previous work, we test for this directly by adding controls for median migrant wages in the province-year to Table 4, Column 2. The results are essentially unchanged. This suggests that simultaneous changes in income in the destination country are not driving the declines in fertility. Throughout the remainder of the paper, we control for median migrant wages to rule out this potential channel.

Our findings show that exposure to changes in reproductive health policy diffuses through migrant networks and leads to declines in fertility in the origin. Related research examines the effects of increased messaging about reproductive health behavior through exposure to media or leaders. These studies are similar to what we examine in that they are not about, for instance, the direct provision of contraceptives, but rather about exposing women to new reproductive health norms. Our study is unique in that it examines this diffusion through migrant networks. To benchmark our effect sizes, we outline the results of each of these related studies. In Brazil, Ferrara, Chong and Duryea (2012) find that exposure to novelas where the main female characters generally had no children led to a 5% decline in the probability of giving birth, similar to the decline in fertility from an increase in women's education of 1.6 years. Kearney and Levine (2015) examine the effect of exposure to the MTV show 16 and Pregnant in the U.S., and find a 6.3% reduction in teen childbearing. Jensen and Oster (2017) study the impacts of exposure to new ideas through cable access in India and find that fertility in rural areas fell by 50% (fertility declined by 3.7 percentage points based on a sample mean of 7.2%). Glennerster, Murray and Pouliquen (2021) find that radio advertisements about contraceptives in Burkina Faso led to a 10% reduction in fertility. Exposure can also increase fertility as in the case of Bassi and Rasul (2017). They find that fertility increased by 1.5% in response to a 10-day papal visit to Brazil, where speeches included discussions of contraceptives and family planning.

Our result of a 0.95% decline in fertility in response to exposure to more liberalized reproductive health policy is much more modest in comparison to these previous studies. Like the aforementioned studies, media will have increased content surrounding reproductive health as policies change in the destination country. For instance, as policies concerning the legality of advertising contraceptive

[20]Note that province fixed effects already remove any province-specific level differences in migrant wages.

methods change, new advertisements will be present in media outlets. Furthermore, general news media will report on the policies. Unlike these previous studies, our study relies on the more diffuse transfer of knowledge across countries, likely resulting in the smaller effect sizes we find.

5.1 Do different types of migrants drive fertility response?

Exposure of female migrants to more liberalized policies may matter more for declines in fertility than male migrant exposure. Women may be empowered to make different fertility choices as a result of exposure. With modern contraceptive methods, women and men can disagree about fertility but women can make their own decisions without the knowledge of men, as in Ashraf, Field and Lee (2014). Such choices would lead to larger declines in fertility from female exposure compared to male exposure. Alternatively, both men and women may transfer information about fertility, which could lead to similar declines in fertility from male versus female exposure. To examine this empirically, we consider whether there is heterogeneity in the effects on fertility depending on whether female or male migrants were exposed to more liberalized policies abroad. To conduct this analysis, we recalculate the base migration rate and shares to each destination country using only female migrants and again using only male migrants. We then construct both female and male migrant weighted liberalization indices, as in equation (1). The results are shown in Columns 3 and 4 of Table 4. Exposing female migrants to more liberalized reproductive health policies seems to lead to larger fertility declines than when male migrants are exposed. For women, a 1 standard deviation increase in exposure to more liberalized policies at destination leads to a 0.17 percentage point, or 1.27%, decline in the fertility rate for provinces at the 75th percentile of baseline female migration relative to the 25th percentile. For men, the effect is much smaller. Male exposure to more liberalized reproductive health policies yields a 0.05 percentage point, or 0.37%, decline in fertility rates. This suggests that the declines in fertility we observe due to migrant exposure to liberalized reproductive health policies are driven by female migrants.

Migrant occupational diversity is another margin by which the exposure to reproductive health policies may vary. Temporary migrants engage in a wide range of occupations while abroad. Their occupation may also affect the intensity of their exposure to changing reproductive health policies. Domestic helpers are one of the largest occupations for contract migrants from the Philippines. Domestic helpers differ from other contract migrants in that they generally reside in the homes of their employers, while contract migrants in other occupations often live with other migrants from their country of origin, whether in dorms or in private housing. As a result of their living

arrangements, domestic helpers are exposed to local customs and local media in a different way, potentially leading to more exposure to changes in reproductive health policies in the destination country. Alternatively, migrants in dorms may be somewhat isolated from local customs, but since much of our variation comes through liberalizing advertisements, viewing these ads may lead to discussion among migrants. Domestic helpers living with local families have less time to interact with other migrants, which could lead to less discussion of newly adopted policies and thus less transfer of knowledge. We test this empirically by constructing both the baseline migration rates and the baseline destination shares for domestic helpers and for non-domestic helpers. Because domestic helpers are overwhelming female (99%), we restrict this analysis to only female migrants. Overall, the resulting declines in fertility are almost twice as large for domestic helpers relative to non-domestic helpers (1.64% versus 0.82%) when comparing the 75th percentile of baseline migration to the 25th percentile (Table 4, Columns 5 and 6).

6 Contraceptive Use

To explore the underlying behavioral changes that drive the fertility decline, we examine the impact of exposure to more liberal reproductive health policies through temporary migration on contraceptive use. The Census does not contain information on contraceptive use, and so to do this analysis, we turn to the rich contraceptive calendar in the PDHS data. Before examining the effects on contraceptive use, we validate whether estimated fertility results in the PDHS are similar to our Census findings.[21] The DHS collects complete retrospective birth histories for all female respondents. Using these self-reported histories, we construct whether a woman gave birth in any particular year from the time they reached the age of menarche to the year of data collection.[22] Our primary indicator of interest is whether a women (age 10 or older) had a birth in any given year. On average, 12.3 percent of women give birth annually (Appendix Table A2). Notably, the PDHS birth rate reliant on these retrospective histories is very similar to that of the Census (10.7

[21] We use the 1998, 2003, 2008, and 2013 PDHS to do this. While a PDHS was conducted in 2018 and is publicly available, the reproductive health policy data we use as our primary source of variation does not extend into this time period.

[22] In an effort to limit bias arising from the representativeness of the constructed panel, we limit the birth histories to cover birth cohorts 18 years prior to the DHS. We restrict the sample to women aged 10 or older at the time of the potential birth. For example, for a women age 15 at the time of the DHS interview, we construct a 5-year retrospective history from the time they were aged 10 to age 15, and record whether they gave birth in each year. However, for a women age 35 at the time of the DHS survey, we consider the past 18-years and determine whether or not she gave birth in each year. Restricting analysis to observations corresponding to the year in which the DHS is collected does not qualitatively change our results, but reduces power.

percent).

We show in Table 5, Column 2 that in response to a 1 standard deviation increase in exposure to more liberal policies in a province, as we move from the 25th percentile of baseline migration to the 75th percentile, births decline by 0.17 percentage points, or 0.90%. These results confirm a similar story to the Census: exposure to more liberal reproductive health policies at the destination leads to reductions in fertility in the origin.

In order to achieve these fertility declines, in what ways do women change their contraceptive behavior? Women could increase their adoption of contraceptives, or they could switch to a more effective contraceptive method. We observe a modest increase (0.03%, when comparing the 75th percentile of baseline migration to the 25th percentile) in overall contraceptive use among women in provinces exposed to more liberal reproductive health policies (Table 5, Column 5), though this result is not statistically significant. We do however observe a pattern of substitution across contraceptive method types. Women in provinces exposed to more liberal reproductive health policies appear to switch from traditional contraceptive methods to modern contraceptive methods. Women are 2.07% more likely to use modern contraceptive methods (Column 3) and 1.4% less likely to use traditional methods (Column 4) in response to a 1 standard deviation increase in exposure to more liberalized policies comparing across the interquartile range of baseline migration.

The two methods that drive this result are injectables and the pill. Prior to 1994, injectable use in the Philippines was extremely low as it had been withdrawn from use in the public sector in 1978 (Council, 1996), offering scope for adoption.[23] The pill is consistently the most common modern contraceptive method used by Filipino women. Injectable and pill adoption increase by 0.15 and 0.13 percentage points respectively, moving from the 25th to 75th of baseline migration.

Modern methods are widely documented to be more effective in limiting conception even when assuming typical rather than perfect use (Polis et al., 2016). Using PDHS estimates, Polis et al. (2016) calculate the 12-month failure rates for a range of contraceptive methods. Even with inconsistent use of modern methods, they find low median failure rates for most methods. For example, the cumulative probability of pregnancy for 100 episodes of use was only 1.7 for injectables and 5.5 for the pill. Traditional methods exhibit much higher failure rates: 12.5 pregnancies for periodic abstinence and 17.2 pregnancies for withdrawal per 100 episodes of use. Thus, even with a modest net increase in contraceptive use, a switch to more modern methods is consistent with the decline

[23] In 1994 the Philippine government re-introduced injectables as an option available to women in the public health sector (Institute of Maternal and Child Health, 1994).

in fertility discussed in Section 5.

Adoption of modern contraceptives enabled declines in fertility in response to exposure to reproductive health policy through migration. Why did this exposure lead women to change their patterns of contraceptive use? Ideally, to understand why women switch from traditional methods to modern methods, we would use annual data on the reasons for the use of their current contraceptive method. Women in the PDHS are not asked why they are using their current contraceptive method. However, questions about why women *discontinue* a particular contraceptive method are asked as part of the retrospective calendars in both the 1998 and 2003 DHS, resulting in a 10 year panel spanning 1994 to 2003. This coincides with the sample period for our contraceptive use analysis in Table 5.

Using this data, we consider all woman-year observations and examine how exposure to more liberalized policies impacts the probability women discontinue any method and the reported reasons for doing so. If women are in fact switching from traditional to modern methods, as Table 5 suggests, then in response to exposure, women must discontinue contraceptive use of one method at a higher rate in order to switch to the new method. In Table 6, we find that discontinuation increases as expected. Moving from the 25th percentile of baseline migration to the 75th percentile yields a 0.30 percentage point, or 1.4%, increase in discontinuation.

But why are women choosing to discontinue their previous contraceptive methods? To identify these mechanisms, we conduct an exploratory analysis using three subsamples based on the choice of methods in a particular year. We first restrict our sample to women who used a modern contraceptive method during the year (Panel B). Women in provinces more exposed to changes in reproductive health policy are more likely to discontinue their use of a modern method than women in areas not exposed to more liberal policies. This is consistent with women experimenting with new modern methods. We see evidence of this in their reasons for discontinuation (Columns 2 through 6). Women do not cite their husband's disapproval (Column 2) or their desire for a more effective method (Column 5) as reasons for discontinuation. Instead, they report side effects (Column 3) and access (Column 4) as reasons for their decision. We think this analysis provides suggestive evidence of experimentation across methods, acknowledging that these effects are not causal due to conditioning on usage, which itself is impacted by exposure.

We next restrict our sample to women who report only using a traditional method in a particular year (Panel C). Women exposed to more liberal policies are again more likely to discontinue the use of traditional methods, but the extent of discontinuation is 2.5 times greater than for modern

methods. This again implies a shift away from traditional methods. Unlike the sample of women discontinuing modern methods, these women cite a desire for a more effective method (Column 5) as a reason for discontinuing traditional methods, while also citing side effects (Column 3) and access (Column 4).

Taken together, this set of results, collectively with our findings in Table 5, suggests a pattern of women trying out modern methods in response to more exposure to liberalized reproductive health policy through temporary migration and ultimately switching to a more effective method, enabling declines in fertility.

7 Implications for children

When exposed to more liberal reproductive health policies through temporary migration, women in origin communities experience lower fertility driven by a shift toward the adoption of more modern methods. Declines in fertility have important implications for the well-being of children (see Schultz (2007), Strauss and Thomas (1995), and Schultz (1993) for a review). Given the declines in fertility that we find, this prompts the question of the potential for economic impacts on children in our setting.

Infant mortality is typically higher among mothers who are poorer, have less education, marry earlier, and are younger. If the marginal woman in the Philippines responding to policy exposure exhibits these characteristics, then it is possible that infant and maternal mortality rates may decrease. However, if the marginal woman tends to have a lower risk of dying (or their babies dying) during childbirth, then these fertility reductions in response to policy exposure could contribute to an increase in the infant and maternal mortality rates. Thus, the impacts on mortality are ambiguous.

We examine the effects of increased exposure to more liberal reproductive policies on infant and maternal mortality in Table 7 using Vital Statistics data from the Philippines. Comparing the 75th percentile of baseline migration to the 25th percentile, a one standard deviation increase in exposure to more liberal reproductive health policies yields a 0.84 decline in deaths per thousand live births, or 4.6%. Maternal mortality also declines by 0.04 deaths per thousand live births, or 3.5%, though the result is not statistically significant.

Beyond infant and maternal mortality, children born into families with lower fertility may experience greater childhood investment. With fewer children, the quantity-quality trade-off model

predicts that households can invest more in their children (Becker, 1960; Becker and Lewis, 1973). We see evidence consistent with this by looking at children's education and engagement in child labor.

Because most children born during our sample period are too young to have yet completed their education, we use data from the PDHS to examine grade for age (child age minus grade minus five), rather than completed educational attainment. The pre-period mean in our sample for grade for age is -2.5, which indicates that children in our sample are about 2.5 school years behind their age-appropriate grade level. Following the quality-quantity model, we anticipate an increase in grade for age for kids in communities experiencing lower fertility due policy exposure. We find suggestive evidence that grade for age increases in response to exposure to more liberalized reproductive health policies.

Growing up in a household with fewer children yields competing effects in terms of engagement in child labor. On the one hand, holding constant household resources, households with fewer children may now be less reliant on child labor income sources. On the other hand, in a setting where factor markets are incomplete, households without a surplus of available labor may then rely on the existing children in the household to supply labor for household enterprises (Edmonds and Theoharides, 2020). To empirically examine the effect on child employment, we use data from the 1994 to 2013 quarterly Philippine Labor Force Survey (LFS) and restrict the analysis to children ages 10 to 16. Our results point to a suggestive decline in child employment in response to exposure to reproductive health policy.

Taken together, children experience positive outcomes as a result of the fertility declines from policy exposure, most notably reduced infant mortality. The magnitude of the reduced infant mortality is meaningful, representing 7.2% of the Philippines' progress in reducing infant mortality between 1993 and 2011 (National Economic and Development Authority and United Nations Development Programme, 2014).

8 Robustness Checks

We explore the robustness of our results to a number of potential concerns (Appendix Table A3). For ease of comparison, Column 1 presents our main results. The first robustness check restricts the sample to all provinces excluding the four districts of Metro Manila (Column 2).[24] Metro

[24]Metro Manila is composed of 17 cities which are aggregated into four districts. We treat each of these districts as provinces in our main analysis.

Manila has the highest rates of baseline migration in 1992, and one might be concerned that it is driving the results. The City of Manila also experienced stringent policies regarding contraceptives during our sample period.[25] Starting in 2000, the then mayor of the City of Manila, Jose Atienza, issued a ban on the sale of modern contraception within the city. This ban, like any program or policy limiting access to contraception within the Philippines, would inhibit the ability of women to respond to reproductive health influences from abroad. Our results are robust to excluding Metro Manila.

Second, we test the sensitivity of the results to our choice of how to code reproductive health policies. In Column 3, we show that the results are robust to imputing missing policy information with zeros rather than leaving them as missing as in our main results. A further concern with the policy coding is that for the sterilization index, policy changes often result in unclear sterilization policy, thus making it difficult to score the sterilization index. To ensure that this policy uncertainty is not driving the results, we omit the sterilization sub-index from the composite index and find similar results (Column 4). Our results are also robust to excluding the variation from temporary migrants to self-governing territories and special administrative regions since the policies adopted in these destinations are often unclear (Column 5).

Third, we examine how the set of destination countries influences our results. The share of migrant flows to different countries varies substantially, raising concerns that our identified effects are driven by a particularly large policy change in a destination country with few migrants. This does not seem to be the case. In Columns 6 through 8, we restrict the analysis to the top 5, 10, and 20 destinations respectively. Our main coefficient of interest is very stable regardless of the subset of countries used.

We next explore whether anticipation of the policy changes is driving the results. Our preferred specification assumes a two-year lag structure due to the contract length temporary workers hold. One concern is that while our identification strategy leverages changes in policy, these changes may simply reflect steady changes in the general reproductive health environment in the destination countries. During the lead-up to the adoption of the policy, temporary migrants may be exposed to more conversations regarding reproductive health. It is possible that this discussion, rather than the explicit policy changes, drives our results. If it is the more general policy environment, then, conditional on exposure, we would also expect to see an effect on fertility from policies changing in the future. In Appendix Table A4 we address this concern by controlling for the reproductive

[25]The City of Manila composes one of the four districts found in Metro Manila.

health policy index two years in the future. This control does not substantively change the estimated impact on fertility of the two-year lagged reproductive health policies, and it is not independently statistically significant. Thus, it seems unlikely that it is the discourse prior to changes in policy driving our results.

Finally, we demonstrate that our results are not sensitive to using 1992 as the base year (Appendix Table A5). To maximize the sample period, our main specification relies on baseline migrant composition and migrant intensity calculated based on migrant flows in 1992, the first year available in the POEA/OWWA data. To determine whether our results are sensitive to this choice of base year, we re-estimate Table 5 using 1993 as the base year and demonstrate that our results are not sensitive to this choice.

9 Conclusion

Exposure to different cultural practices in destination countries may affect the behavior and preferences of temporary migrants. Upon return to their country of origin, these migrants may transmit this knowledge and norms to their communities of origin. In this paper, we examine the effect of exposure to more liberalized reproductive health policies on fertility decisions in the Philippines. We find that fertility declines in response, and that this decline is due to switching from traditional to modern contraceptive methods, namely the pill and injectables. Our identification strategy eliminates concerns that the declines in fertility that we find are due to increased income from migration or migrant absence. Instead, our results appear to be driven by the desire to switch to more effective contraceptive methods. We also find positive effects on children as a result of declines in fertility, namely on reduced infant mortality rates.

Inasmuch as changes in fertility impact long-run development, our results suggest that this diffusion of behavior is another mechanism through which migration affects origin-country development. Broadly, our results emphasize the important influence that destination countries have on migrant origin countries, not only through monetary remittances, but also through "cultural remittances" (Rapoport, Sardoschau and Silve, 2020). As migration continues to increase globally, understanding this resulting cultural change will shed light on the long-run development impacts for migrant-origin countries.

References

Abarcar, Paolo, and Caroline Theoharides. 2021. "Medical worker migration and origin-country human capital: Evidence from us visa policy." *The Review of Economics and Statistics*, Forthcoming.

Adao, Rodrigo, Michal Kolesar, and Eduardo Morales. 2019. "Shift-Share Designs: Theory and Inference." *The Quarterly Journal of Economics*, 134(4): 1949–2010.

Ashraf, Nava, Erica Field, and Jean Lee. 2014. "Household Bargaining and Excess Fertility: An Experimental Study in Zambia." *American Economic Review*, 104(7): 2210–2237.

Ashraf, Quamrul H., David N. Weil, and Joshua Wilde. 2013. "The Effect of Fertility Reduction on Economic Growth." *Population and Development Review*, 39(1): 97–130.

Baker, Michael, Dwayne Benjamin, and Shuchita Stanger. 1999. "The Highs and Lows of the Minimum Wage Effect: A Time-Series Cross-Section Study of the Canadian Law." *Journal of Labor Economics*, 17(2): 318–350.

Barsbai, Toman, Hillel Rapoport, Andreas Steinmayr, and Christoph Trebesch. 2017. "The Effect of Labor Migration on the Diffusion of Democracy: Evidence from a Former Soviet Republic." *American Economic Journal: Applied Economics*, 9(3): 36–69.

Bassi, Vittorio, and Imran Rasul. 2017. "Persuasion: A Case Study of Papal Influences on Fertility-Related Beliefs and Behavior." *American Economic Journal: Applied Economics*, 9(4): 250–302.

Batista, Catai, and Pedro C. Vicente. 2011. "Do Migrants Improve Governance at Home? Evidence from a Voting Experiment." *World Bank Economic Review*, 25(1): 77–104.

Becker, Gary. 1960. "An Economic Analysis of Fertility." *Demographic and Economic Change in Developed Countries*.

Becker, Gary, and H. Gregg Lewis. 1973. "On the Interaction between the Quantity and Quality of Children." *Journal of Political Economy*, 81: S279–S288.

Beine, Michel, Frederic Docquier, and Maurice Schiff. 2013. "International Migration, Transfer of Norms, and Home Country Fertility." *Canadian Journal of Economics*, 46(4): 1406–1430.

Bertoli, Simone, and Francesca Marchetta. 2015. "Bringing It All Back Home – Return Migration and Fertility Choices." *World Development*, 65: 27–40.

Borusyak, Kirill, Peter Hull, and Xavier Jaravel. 2020. "Quasi-Experimental Shift-Share Research Designs." *Review of Economic Studies*, Forthcoming.

Bound, John, and Sarah Turner. 2006. "Cohort crowding: How resources affect collegiate attainment." *Journal of Public Economics*, 91: 877–899.

Caballero, Maria Esther, Brian Cadena, and Brian Kovak. 2023. "The International Transmission of Local Economic Shocks Through Migrant Networks." *Working Paper*.

Chauvet, Lisa, and Marion Mercier. 2014. "Do return migrants transfer political norms to their origin country? Evidence from Mali." *Journal of Comparative Economics*, 42(3): 630–51.

Clemens, Michael, Claudio E. Montenegro, and Lant Pritchett. 2019. "The Place Premium: Bounding the Price Equivalent of Migration Barriers." *Review of Economics and Statistics*, 101(2): 201–213.

Council, Population. 1996. "Reintroducing DMPA to the Philippine Family Planning Program: A longitudinal study of continuing users and drop-outs. Final Report." *Special Report. Manila: Population Council, Department of Health, Manila and Family Planning Operations Research and Training Program (FPORTP).*

Cox-Edwards, Alejandra, and Manuelita Ureta. 2003. "International Migration, Remittances, and Schooling: Evidence from El Salvador." *Journal of Development Economics*, 72(2): 429–461.

Dannecker, Petra. 2005. "Transnational Migration and the Transformation of Gender Relations: The Case of Bangladeshi Labour Migrants." *Current Sociology*, 53(4): 655–673.

Daudin, Guillaume, Raphaël Franck, and Hillel Rapoport. 2019. "Can Internal Migration Foster the Convergence in Regional Fertility Rates? Evidence from 19th Century France." *The Economic Journal*, 129(620): 1618–1692.

Dinkelman, Taryn, and Martine Mariotti. 2016. "What are the Long Run Effects of Labor Migration on Human Capital? Evidence from Malawi." *American Economic Journal: Applied Economics*, 8(1): 1–35.

Edmonds, Eric, and Caroline Theoharides. 2020. "The short term impact of a productive asset transfer in families with child labor: Experimental evidence from the Philippines." *Journal of Development Economics*, 146.

Fargues, Philippe. 2011. "International migration and the demographic transition: A two-way interaction." *International Migration Review*, 45: 588–614.

Ferrara, Eliana La, Alberto Chong, and Suzanne Duryea. 2012. "Soap Operas and Fertility: Evidence from Brazil." *American Economic Journal: Applied Economics*, 4(4): 1–31.

Finlay, Jocelyn E., David Canning, and June Y. Po. 2012. "Reproductive Health Laws Around the World." Working Paper.

Glennerster, Rachel, Joanna Murray, and Victor Pouliquen. 2021. "The Media or the Message: Experimental Evidence on Mass Media and Modern Contraception Uptake in Burkina Faso." *CSAE Working Paper*, 2021-04.

Goldsmith-Pinkham, Paul, Isaac Sorkin, and Henry Swift. 2020. "Bartik Instruments: What, When, Why, and How." *American Econoimc Review*, 110(8): 2586–2624.

Herrin, Alejandro. 2007. "Development of the Philippines' family planning program: The early years, 1967-80. In Warren Robinson and John Ross (Eds.), The global family planning revolution: Three decades of population policies and programs." *Washington, D.C.: World Bank.*, 277–297.

Hildebrandt, Nicole, and David McKenzie. 2005. "The Effects of Migration on Child Health in Mexico." *Economia*, 6: 257–289.

Institute of Maternal and Child Health. 1994. "PFPP re-introduces DMPA." *IMCH newsletter*, Jan-Feb:1(20(205)): 1.

Jensen, Eric, and Dennis Ahlburg. 2004. "Why does migration decrease fertility? Evidence from the Philippines." *Population Studies*, 58: 219–231.

Jensen, Robert, and Emily Oster. 2017. "The Power of TV: Cable Television and Women's Status in India." *The Quarterly Journal of Economics*, 124(3): 1057–1094.

Joshi, Shareen, and Paul T. Schultz. 2012. "Family Planning and Women's and Children's Health: Long-Term Consequences of an Outreach Program in Matlab, Bangladesh." *Demography*, 50(1): 149–1807.

Kearney, Melissa, and Phil Levine. 2015. "Media Influences on Social Outcomes: The Impact of MTV's 16 and Pregnant on Teen Childbearing." *American Economic Review*, 105(12): 3597–3632.

Khanna, Gaurav, Emir Murathanoglu, Caroline Theoharides, and Dean Yang. 2021. "Abundance from Abroad: Migrant Income and Long-Run Economic Development." Working Paper.

Laguna, Elma P., Anna Liza C. Po, and Aurora E. Perez. 2000. "Contraceptive Use Dynamics in the Philippines: Determinants of Contraceptive Method Choice and Discontinuation." DHS Report.

Lindstrom, David P., and Silvia Giorguli Saucedo. 2002. "The short-and long-term effects of US migration experience on Mexican women's fertility." *Social Forces*, 80: 1341–1368.

Munshi, Kaivan. 2003. "Networks in the Modern Economy: Mexican Migrants in the U.S. Labor Market." *Quarterly Journal of Economics*, 118(2): 549–599.

National Economic and Development Authority and United Nations Development Programme. 2014. "The Philippines Fifth Progress Report - Millennium Development Goals."

National Statistics Office (NSO) and ICF Macro (ICF). 2009. "National Demographic and Health Survey 2008."

National Statistics Office (NSO) and ORC Macro (ORC). 2004. "National Demographic and Health Survey 2003."

National Statistics Office (NSO), Department of Health (DOH) and Macro International Inc. (MI). 1999. "National Demographic and Health Survey 1998."

Nunn, Nathan. 2022. "On the Dynamics of Human Behavior: The Past, Present, and Future of Culture, Conflict, and Cooperation." *AEA Papers and Proceedings*, 112: 15–37.

Philippine Statistics Authority (PSA) and ICF International (ICF). 2014. "Philippines National Demographic and Health Survey 2013."

Polis, Chelsea B., Sarah E.K. Bradley, Arinrinola Bankole, Tsuyoshi Onda, Trevor Croft, and Susheela Singh. 2016. "Typical-use contraceptive failure rates in 43 countries with Demographic and Health Survey data: summary of a detailed report." *Contraception*, 94(1): 11–17.

Rapoport, Hillel, Sulin Sardoschau, and Arthur Silve. 2020. "Migration and Cultural Change." CESifo Working Paper 8547.

Schultz, Paul T. 1993. "Returns to Women's Education." *Women's Education in Developing Countries: Barriers, Benefits, and Policies.*

Schultz, T. Paul. 2007. "Chapter 52 Population Policies, Fertility, Women's Human Capital, and Child Quality." *Handbook of Development Economics*, 4: 3249–3303.

Spilimbergo, Antonio. 2009. "Democracy and Foreign Education." *American Economic Review*, 99(1): 528–43.

Strauss, John, and Duncan Thomas. 1995. "Human Resources: Empirical Modeling of Household and Family Decisions." *Handbook of Development Economics*, 3: 1883–2023.

Theoharides, Caroline. 2018. "Manila to Malaysia, Quezon to Qatar: International Migration and its Effects on Origin-Country Human Capital." *Journal of Human Resources*, 53(4): 1022–1049.

Tuccio, Michele, and Jackline Wahba. 2018. "Return Migration and the Transfer of Gender Norms: Evidence from the Middle Easta." *Journal of Comparative Economics*, 46: 1006–1029.

Tuccio, Michele, Jackline Wahba, and Bachir Hamdouch. 2019. "International migration as a driver of political and social change: evidence from Morocco." *Journal of Population Economics*, 32: 1171–1203.

Winkler, William E. 2004. "Methods for Evaluating and Creating Data Quality." *Information Systems*, 29(7): 531–550.

Woodruff, Christopher, and Rene Zenteno. 2007. "Migration Networks and Microenterprises in Mexico." *Journal of Development Economics*, 82(2): 509–528.

Yang, Dean. 2008. "International Migration, Remittances, and Household Investment: Evidence from Philippine Migrants' Exchange Rate Shocks." *Economic Journal*, 118(2): 591–630.

Yang, Dean, and HwaJung Choi. 2007. "Are Remittances Insurance? Evidence from Rainfall Shocks in the Philippines." *World Bank Economic Review*, 21(2): 219–48.

Tables and Figures

Figure 1: Pill Scoring Mechanism

Scoring	0	1	2	3
Sale purpose	illegal	non-contraceptive	contraceptive	
Sale location	illegal	pharmacy	shop	
Prescription requirement	illegal	prescription required	no prescription required	
Subsidy	illegal	commercially available	subsidized	free
Commercial advertising	illegal	legal via reproductive health education programs, or advertising only to doctors and pharmacies	legal with some restrictions	legal without restrictions

Reproduced from Finlay, Canning and Po (2012), Table 1, page 24.

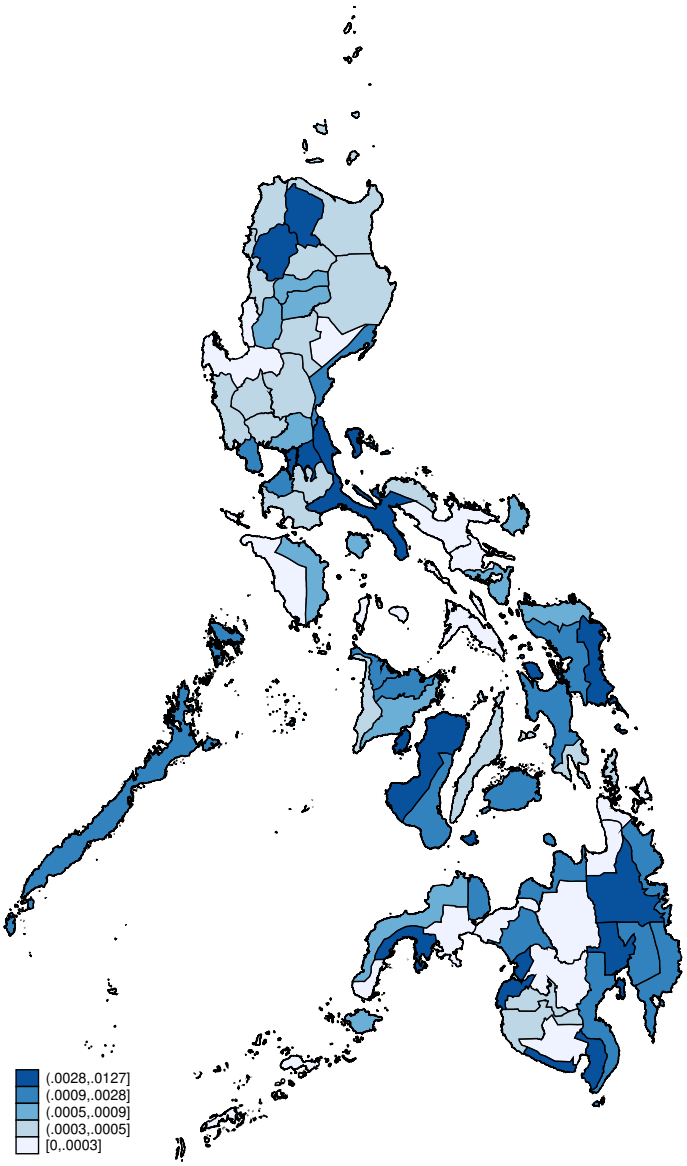

Figure 2: Geographical Variation in the Change in the Weighted Liberalization Index: 1994-2013

Note: We plot the overall change in the policy exposure measure between 1994 and 2013.

Table 1: Province-level Descriptive Statistics on Filipino Migration

	Mean (1)	SD (2)	Min (3)	Max (4)
Panel A. Baseline Migrants Per 1,000 Residents				
All Migrants	2.179	2.791	0.033	15.379
Female Migrants	1.138	1.356	0.020	8.001
Male Migrants	1.042	1.625	0.013	7.378
Female Domestic Helper Migrants	0.614	0.652	0.000	2.888
Female Non-Domestic Helper Migrants	0.524	0.843	0.000	5.128
Number of Destinations at Baseline	24.345	13.201	1.000	65.000

	Mean (1)	SD (2)	Min (3)	Max (4)
Panel B. Baseline Migrants Per 1,000 Residents for Top 20 Destinations				
1. Saudi Arabia	1.016	1.569	0.000	8.338
2. Japan	0.261	0.602	0.000	3.418
3. Hong Kong	0.162	0.259	0.000	1.224
4. United Arab Emirates	0.130	0.146	0.000	0.709
5. Kuwait	0.041	0.062	0.000	0.315
6. Bahrain	0.051	0.060	0.000	0.271
7. Qatar	0.056	0.100	0.000	0.631
8. Malaysia	0.054	0.074	0.000	0.363
9. Brunei Darussalam	0.040	0.049	0.000	0.219
10. Northern Mariana Islands	0.036	0.062	0.000	0.261
11. Singapore	0.029	0.040	0.000	0.203
12. United States of America	0.018	0.033	0.000	0.173
13. Oman	0.019	0.023	0.000	0.125
14. Libya	0.012	0.022	0.000	0.107
15. Guam	0.009	0.030	0.000	0.264
16. Taiwan	0.009	0.018	0.000	0.101
17. Greece	0.012	0.047	0.000	0.410
18. Lebanon	0.006	0.007	0.000	0.028
19. Iran	0.004	0.011	0.000	0.084
20. Yemen	0.003	0.006	0.000	0.034

Note: Baseline is 1992, the first year of the POEA/OWWA data. All variables are measured at the province-level. Number of provinces = 84. Source: POEA and OWWA.

Table 2: Policy Variation

		Proportion	Number of changes			
	N	any change	Mean	SD	Min	Max
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Policy changes at the destination country-level						
All policy changes	85	0.424	1.365	2.419	0	12
Abortion policy changes	85	0.094	0.282	1.053	0	6
Pill policy changes	85	0.224	0.424	1.062	0	6
Condom policy changes	85	0.212	0.376	0.988	0	7
IUD policy changes	85	0.035	0.118	0.565	0	3
Sterilization policy changes	85	0.141	0.235	0.479	0	2

	N	Mean	SD	Min	Max
	(1)	(2)	(3)	(4)	(5)
Panel B. Liberalization indices at the destination country-year level					
Abortion index	1,700	58.891	36.085	0	100
Pill index	1,500	65.767	15.009	0	100
Condom index	1,500	65.258	17.410	0	100
IUD index	1,500	76.489	26.755	0	100
Sterilization index	1,510	86.446	21.509	33.333	100
Standardized index	1,460	-0.000	1.000	-4.431	1.767

	N	Mean	SD	Min	Max
	(1)	(2)	(3)	(4)	(5)
Panel C. Policy variation at the province-year level					
Any policy change	1,680	0.900	0.300	0	1
Number of policy changes	1,680	6.050	12.072	0	44
Number of liberalizing changes	1,680	4.650	9.353	0	37
Number of de-liberalizing changes	1,680	1.150	2.921	0	12

	N	Mean	SD	Min	Max
	(1)	(2)	(3)	(4)	(5)
Panel D. Liberalization index variation over sample period					
Base Migration Rate (1992, proportion)	1,680	0.002	0.003	.0000329	.0153787
Weighted Liberalization index	1,680	-0.000	1.000	-2.986952	2.611807
Base Migration X Weighted Liberalization Index	1,680	-0.000	0.003	-.0195368	.006822

Note: In Panel B, observations vary slightly across variables due to missing policy information for a subset of specific types of reproductive health policies for selected countries in some years. Sources: Finlay, Canning and Po (2012) and authors' calculations, POEA, OWWA, and Census.

Table 3: Falsification Tests

	Coefficient	Clustered SE
Panel A. Destination Balance		
Domestic Worker Share	-0.0002	(0.0011)
Female Share	-0.002	(0.003)
OFW Share	-0.002	(0.007)
Remittance Share	0.001	(0.004)
Real GDP (in USD billions)	-65.196	(58.859)
Fertility Rate (birth per woman)	0.072	(0.055)
Number of Destination Countries	85	
Number of Years	21	

	Coefficient	Clustered SE
Panel B. Province Balance		
Ratio Males to Females (1990)	-0.352	(0.571)
Share Secondary education (1990)	1.091	(1.375)
Share Catholic (1990)	-2.032	(3.540)
Share Urban (1990)	-0.982	(1.927)
Asset Index (1990)	16.246*	(9.020)
Census Births (1990)	-0.668**	(0.316)
Census Births (1985-1990)	-0.155	(0.218)
Number of observations	1680	

	Coefficient	Clustered SE
Panel C. Pre-trends		
Census Births	0.009	(0.023)
Number of observations	680	

Note: In Panel A, we regress destination-level controls on the destination-level liberalization index and year fixed effects. The unit of variation is the destination-year. Regressions are weighted by the average destination exposure share across provinces following Borusyak, Hull and Jaravel (2020). In Panel B, we report coefficients on the policy exposure variable, $MigRate_{p,t=0}XWeightedLibIndex_{p,t=2}$, controlling for year fixed effects, $WeightedLibIndex_{p,t=2}$, and $MigRate_{p,t=0}$. All regional balance variables are measured using the 1990 Census. Regressions are at the province-year level. In Panel C, the sample period is from 1985 to 1990. We report the coefficient on the interaction term: change in $MigRate_{p,t=0}XWeightedLibIndex_{p,t=2}$ times $Year$. In Panel A, standard errors clustered at the destination level are in parentheses. In Panels B and C, standard errors clustered at the province level are in parentheses. Source: World Development Indicators, Bangko Sentral ng Pilipinas, POEA/OWWA, and Census.

Table 4: Fertility Effects of Exposure to Reproductive Health Liberalization

	Total migrant variation		Female variation	Male variation	Domestic Helper variation	Non-Domestic Helper variation
	(1)	(2)	(3)	(4)	(5)	(6)
Base Migration X Weighted Liberalization Index	-0.503***	-0.513***	-1.250**	-0.713**	-3.062***	-2.730***
	(0.186)	(0.190)	(0.581)	(0.276)	(0.844)	(1.021)
Control Mean	0.134	0.134	0.134	0.134	0.134	0.134
Observations	1680	1680	1680	1680	1680	1680
IQR (Baseline Migration Rate)	0.0025	0.0025	0.0014	0.0007	0.0007	0.0004
Coefficient X IQR	-0.0013	-0.0013	-0.0017	-0.0005	-0.0022	-0.0011
Wage Control	N	Y	Y	Y	Y	Y

Note: Standard errors clustered by province are in parentheses. The weighted liberalization index is standardized. Columns 1 and 2 weight the liberalization index by exposure shares based on all migrants. Columns 3 through 6 use exposure shares and baseline migration rates calculated from the specified group in the column header. Columns 2 through 6 contain a province-year level control for median migrant wages. Source: POEA/OWWA and Census.

Table 5: Exposure to Reproductive Health Liberalization on Contraceptive Use

	Fertility (Census)	Fertility (DHS)	Modern methods	Traditional methods	Any contraceptive method	Pill	IUD	Injectable	Condom	Sterilization
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Base Migration X Weighted Liberalization Index	-0.513***	-0.667*	0.985**	-1.022**	0.045	0.511	-0.191	0.587***	0.161	0.093
	(0.190)	(0.391)	(0.456)	(0.430)	(0.598)	(0.372)	(0.152)	(0.112)	(0.130)	(0.159)
Control Mean	0.134	0.189	0.121	0.186	0.290	0.051	0.018	0.002	0.004	0.046
Observations	1,680	514,910	137,454	137,454	137,454	137,454	137,454	137,454	137,454	137,454
Coefficient X IQR	-0.0013	-0.0017	0.0025	-0.0026	0.0001	0.0013	-0.0005	0.0015	0.0004	0.0002

Note: Standard errors clustered by province are in parentheses. The weighted liberalization index is standardized. The liberalization index uses exposure shares based on all migrants. The sample period in Columns 1 and 2 is 1994 to 2013. The sample period in Columns 3 through 10 is 1994 to 2003. Source: POEA/OWWA, Census, and PDHS.

Table 6: Reasons for Discontinuation of Contraception

		Reason for discontinuation of method was:				
	Any Discontinuation	Husband Disapproved	Side Effects	Access	More Effective Method	Costly
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Full Sample						
Base Migration X Weighted Liberalization Index	1.194***					
	(0.339)					
Control Mean	0.218					
Observations	137,454					
Coefficient X IQR	0.0030					
Panel B. Conditional on using a modern method in year t						
Base Migration X Weighted Liberalization Index	1.813**	0.050	1.254**	0.424*	-0.011	0.022
	(0.701)	(0.069)	(0.493)	(0.254)	(0.112)	(0.043)
Control Mean	0.383	0.009	0.150	0.057	0.010	0.000
Observations	23,346	23,346	23,346	23,346	23,346	23,346
Coefficient X IQR	0.0045	0.0001	0.0031	0.0011	-0.0000	0.0001
Panel C. Conditional on using a traditional method in year t						
Base Migration X Weighted Liberalization Index	4.690***	0.139	0.657**	0.377*	0.810***	0.001
	(0.986)	(0.102)	(0.268)	(0.209)	(0.204)	(0.020)
Control Mean	0.511	0.015	0.083	0.043	0.029	0.000
Observations	17,545	17,545	17,545	17,545	17,545	17,545
Coefficient X IQR	0.0117	0.0003	0.0016	0.0009	0.0020	0.0000

Note: Standard errors clustered by province are in parentheses. The weighted liberalization index is standardized. The liberalization index uses exposure shares based on all migrants. The sample period is 1994 to 2003. Source: POEA/OWWA, Census, PDHS.

Table 7: Effect of Exposure to Reproductive Health Liberalization on Child Well-being

	Infant mortality rate	Maternal mortality rate	Grade for age	Child employment (ages 10-16)
	(1)	(2)	(3)	(4)
Base Migration X Weighted Liberalization Index	-334.753*	-17.383	3.217	-1.084
	(137.533)	(13.226)	(6.393)	(1.053)
Control Mean	18.202	1.231	-2.532	0.141
Observations	1,258	1,200	78,618	1,591
Coefficient X IQR	-0.8369	-0.0435	0.0080	-0.0027

Note: Standard errors clustered by province are in parentheses. The weighted liberalization index is standardized. The liberalization index uses exposure shares based on all migrants. The sample period is 1995 to 2010 in Columns 1 and 2 and 1994 to 2013 in Columns 3 and 4. Source: Census, POEA, OWWA, Philippine Labor Force Survey (LFS), and Vital Statistics.

Table A1: Disaggregated Policy Variation at Destination-Country Level

			Number of Policy Changes			
	N	% Any Change	Mean	SD	Min	Max
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Pill-Specific Policy Changes						
Purpose	85	0.024	0.047	0.263	0	2
Location	85	0.012	0.012	0.108	0	1
Prescription	85	0.035	0.047	0.263	0	2
Susbidy	85	0.071	0.106	0.379	0	2
Commercial Advertising	85	0.153	0.153	0.362	0	1
Panel B. Condom-Specific Policy Changes						
Purpose	85	0.012	0.035	0.241	0	2
Subsidy	85	0.082	0.106	0.379	0	2
Commercial Advertising	85	0.153	0.153	0.362	0	1

Source: Finlay, Canning and Po (2012) and POEA/OWWA.

Table A2: Descriptive Statistics

	N	Mean	SD
	(1)	(2)	(3)
Panel A. Census data (province-level)			
Less than completed primary schooling	336	0.110	0.100
Completed primary schooling	336	0.116	0.083
Some secondary schooling	336	0.196	0.161
Completed secondary (or more) schooling	336	0.181	0.102
More than completed secondary schooling	336	0.445	0.288
Share Catholic	168	0.753	0.215
Share urban	84	0.300	0.268
Share married	336	0.544	0.044
Average age	336	29.252	0.554
Province birth rate (Proportion of women giving birth per annum)	1,680	0.107	0.021
Panel B. PDHS data (individual-level)			
Birth (Woman gave birth)	362,980	0.123	0.331
Used any contraceptive method	137,454	0.311	0.463
Used a modern contraceptive method	137,454	0.183	0.387
Used a traditional contraceptive method	137,454	0.141	0.348
Used the pill	137,454	0.077	0.267
Used an IUD	137,454	0.026	0.158
Used an injectable	137,454	0.018	0.134
Used a condom	137,454	0.011	0.104
Sterilized	137,454	0.057	0.231

Table A3: Fertility Effects of Exposure to Reproductive Health Liberalization: Robustness to Alternative Index Definitions

	All destination countries					Top 5	Top 10	Top 20
	Total migrant variation	Excludes Manila	Imputed policy information	Excluding sterilization	Excluding territories	destinations only	destinations only	destinations only
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Base Migration X Weighted Liberalization Index	-0.513***	-0.734**	-0.509***	-0.539***	-0.436***	-0.535***	-0.509***	-0.518***
	(0.190)	(0.336)	(0.189)	(0.194)	(0.156)	(0.185)	(0.183)	(0.190)
Control Mean	0.134	0.136	0.134	0.134	0.134	0.134	0.134	0.134
Observations	1,680	1,600	1,680	1,680	1,680	1,680	1,680	1,680

Note: Standard errors clustered by province are in parentheses. The weighted liberalization index is standardized. Source: POEA/OWWA, Census, PDHS.

Table A4: Effect of Exposure to Reproductive Health Liberalization on Fertility and Contraceptive Use: Sensitivity to Leads

	Fertility (Census)	Fertility (DHS)	Modern methods	Traditional methods	Any contraceptive method	Pill	IUD	Injectable	Condom	Sterilization
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Base Migration X Weighted Liberalization Index	-0.517***	-0.732*	1.132***	-0.835**	0.345	0.497	-0.131	0.655***	0.207	0.083
	(0.192)	(0.379)	(0.400)	(0.379)	(0.469)	(0.336)	(0.122)	(0.115)	(0.150)	(0.143)
Base Migration X Weighted Liberalization Index (Lead 2)	-0.147	-0.429	0.546	0.674	1.087	-0.038	0.224	0.264*	0.181	-0.074
	(0.134)	(0.335)	(0.418)	(0.394)	(0.662)	(0.231)	(0.159)	(0.133)	(0.158)	(0.132)
Control Mean	0.189	0.189	0.121	0.186	0.290	0.051	0.018	0.002	0.004	0.046
Observations	1,680	514,910	137,454	137,454	137,454	137,454	137,454	137,454	137,454	137,454

Note: Standard errors clustered by province are in parentheses. The weighted liberalization index is standardized. Base migration x weighted liberalization index is the two year lag, as in all of our main specifications. Source: POEA/OWWA, Census, PDHS.

Table A5: Robustness Check: Alternative Base Share Year (1993)

	Fertility (Census)	Fertility (DHS)	Modern methods	Traditional methods	Any contraceptive method	Pill	IUD	Injectable	Condom	Sterilization
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Base Migration X Weighted Liberalization Index	-0.800***	-0.844*	1.297**	-1.327**	0.036	0.590	-0.231	0.743***	0.231	0.140
	(0.179)	(0.477)	(0.590)	(0.572)	(0.764)	(0.461)	(0.190)	(0.142)	(0.176)	(0.209)
Control Mean	0.134	0.189	0.121	0.186	0.290	0.051	0.018	0.002	0.004	0.046
Observations	1,680	514,910	137,454	137,454	137,454	137,454	137,454	137,454	137,454	137,454

Note: Standard errors clustered by province are in parentheses. The weighted liberalization index is standardized. Source: POEA/OWWA, Census, PDHS.