When Women's Work Disappears: Marriage and Fertility Decisions in Peru

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Abstract

This paper studies the gendered labor market and demographic effects of trade liberalization in Peru. To identify these effects, we use variation in the exposure of local labor markets to import competition from China based on their baseline industrial composition. On average, the increase in Chinese imports during 1998-2008 led to a persistent decline in the employment share of low-educated female workers but had smaller and transitory effects on the employment of low-educated men. In contrast to the predictions of Becker's model of household specialization, we find that the increase in import competition during this period increased the share of single low-educated people and decreased their marriage rates. There is little evidence that import competition affected fertility decisions. The results highlight the role of gains from joint consumption in marriage formation.

JEL: J16, J12, J13, J23
Keywords: Import Competition, marriage formation, fertility

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1 Introduction

Trade liberalization policies and the accession of China into the World Trade Organization (WTO) in 2001 have reshaped the labor markets in many developing countries (Topalova, 2007; Chiquiar, 2008; Ferreira et al., 2010; Topalova, 2010; Kovak, 2013; Dix-Carneiro and Kovak, 2017; McCaig and Pavcnik, 2018; Erten et al., 2019). Importantly, several studies have shown that the labor market effects of openness to trade vary by gender (Juhn et al., 2014; Gaddis and Pieters, 2017; Ben Yahmed and Bombarda, 2020; Erten and Keskin, 2021; Mansour et al., 2022; Wang et al., 2022).[1] These gendered effects of exposure to trade on employment and wages, especially if persistent, are likely to have profound implications on marital formation and fertility that could vary across different countries (Braga, 2018; Autor et al., 2019; Erten and Keskin, 2021; Giuntella et al., 2022; Keller and Utar, 2022).

In this paper, we study the effects of increased import competition in Peru on marriage and fertility. We contribute to the literature in two important ways. First, as shown by Mansour et al. (2022), exposure to import competition in Peru did not have long-term negative effects on the employment of men but led trade-exposed low-educated female workers to sort into the non-tradable sector or to leave the labor force. Thus, the Peruvian experience provides a unique opportunity to study the impact of reduced demand for female workers on marriage and fertility. This contrasts with most existing studies, which have focused on labor demand shocks that disproportionately affected male workers (Braga, 2018; Autor et al., 2019; Giuntella et al., 2022). This is an important distinction because the mechanisms through which labor demand shocks impact marital and fertility outcomes may differ by gender. Second, we study the effects of trade on marriage and fertility in the context of

[1]Several mechanisms explain the differential effects by gender of trade liberalization in the labor market (Pieters, 2018). Some studies have found positive effects of trade liberalization on females' labor outcomes, and these have been mostly driven by technology adoption and growth of female intensive industries or sectors (Juhn et al., 2014; Ben Yahmed and Bombarda, 2020; Erten and Keskin, 2021; Wang et al., 2022). Other studies have found either negative effects of trade liberalization on female labor outcomes, or no effects on the gender employment and/or wage gap (Gaddis and Pieters, 2017; Ben Yahmed and Bombarda, 2020; Mansour et al., 2022).

a developing country with distinct family- and labor-related policies, and different labor market adjustments, compared to those documented in developed countries. In fact, to our knowledge, Keller and Utar (2022) is the only other study that examined the demographic effects of a trade-related shock that reduced women's employment opportunities in Denmark, a country with substantially different resources, institutions, and gender norms than Peru.

To identify the labor market, marital, and fertility effects of increased import competition in Peru after China's accession to the WTO, we follow a local labor market approach and map trade shocks to local areas using baseline (pre-accession) variation in their industrial composition (Topalova, 2007; Autor et al., 2013; Dix-Carneiro and Kovak, 2017).[2] In principle, our measure captures an increase in competition for domestically produced goods and access to cheaper raw materials or intermediate inputs from China. We provide evidence, however, that the rise in direct import competition during our period of analysis was substantially larger than the rise in imports of intermedite goods. To alleviate concerns about the validity of the empirical strategy, we instrument the changes in Peru's imports from China using changes in Chinese imports to its neighboring countries. The instrumental variable strategy, which was proposed by Autor et al. (2013), ensures that we identify the trade-related shocks to labor demand and not other domestic shocks to productivity.[3]

We first replicate the main results of Mansour et al. (2022) on the labor market effects to trade exposure using data from the *Encuesta Nacional de Hogares* (ENAHO) for 1998 and 2008. This representative cross-sectional household survey enables us to observe 146 distinct

[2]The local labor market approach and the use of baseline area characteristics to map national level shocks follow the work of Bartik (1991), Blanchard and Katz (1992), and Borjas and Ramey (1995). Most studies on the labor market effects of trade liberalization follow a similar approach, see for example, Topalova (2007), Chiquiar (2008), Topalova (2010), Edmonds et al. (2010), Kis-Katos and Sparrow (2011), McCaig (2011), Hasan et al. (2012), Kovak (2013), and Gaddis and Pieters (2017).

[3]Furthermore, Mansour et al. (2022) provide strong evidence that the baseline industrial composition in markets most exposed to trade are not correlated with other important factors that could impact marriage and fertility, such as the employment share of female workers, the share of low-educated people, and the size of the manufacturing and tradable sectors (Goldsmith-Pinkham et al., 2020).

labor markets. Exposure to import competition from China reduced the employment of low-educated female workers relative to the population ages 25-55 in the average local labor market. In contrast, there is little evidence that exposure to import competition led to a long-term decline in the employment share of low-educated male workers.[4] Specifically, the results indicate that an average exposure of $170 in import competition per worker between 1998-2008 led to a 1.2 percent decline in the employment share of low-educated women. Mansour et al. (2022) show that this aggregate effect masks an important reallocation pattern across sectors. Mainly, the decline in the employment share of low-educated women is about three times larger in the tradable sector (about 3.7 percent) and corresponds to a partial movement into informal jobs in the non-tradable sector (2.8 percent) and about a 1 percent decrease in their labor force participation. In contrast, male workers do not sort into the non-tradable sector, which indicates that the increased demand in exporting industries favored male workers relative to their female peers (Do et al., 2016; Gaddis and Pieters, 2017).

The disproportionate effects of import competition on the labor market outcomes of low-educated female workers may impact marriage and fertility decisions. In principle, a change in labor market opportunities may increase or decrease the benefits from marriage and has ambiguous effects on fertility. On the one hand, neoclassical models of marriage predict that a relative decline in the labor market opportunities for women will increase gains from household specialization and decrease the opportunity cost of having children (Becker, 1973; Keller and Utar, 2022). On the other hand, it is possible that an absolute decline in labor market opportunities for female workers may reduce the gains from joint consumption (e.g., children) and the desirability of marriage by both men and women (Wilson and Neckerman, 1986; Wilson, 1996; Mansour and McKinnish, 2014). Similarly, an absolute decline in income can reduce fertility if children are a normal good (Lindo, 2010; Cesarini et al., 2017). Finally, it is also possible that the effects of trade on the labor market may have induced general equilibrium effects in the marriage markets in the sense of changing the mating opportunities

[4]Low education includes those with a high school degree or below.

for workers who were not directly displaced by import competition. Our empirical strategy estimates the overall changes in marriage and fertility rates, which captures spillover effects on other individuals competing in the same marriage market (Geruso and Royer, 2019).

In the context of trade shocks, Autor et al. (2019) found that exposure to Chinese imports led to a larger decline in the employment and earnings of U.S. male young adults and linked it to a decline in marriage rates. Keller and Utar (2022) also found support for Becker (1973)'s predictions in the context of Denmark, where women exposed to increased import competition were more likely to enter a union, and less likely to divorce. Other studies, however, did not find that a trade-induced decline in males' labor market opportunities led to a decline in marriage or impacted the likelihood of divorce (Braga, 2018; Giuntella et al., 2022).[5]

Our estimated effects on the relationship between import competition and marital formation indicate that the rates of single low-educated men and women aged 25-55 increased in more trade-exposed local labor markets. Specifically, an average increase of $170 per worker in import competition is associated with about an 11 percent increase in the share of low-educated women who are single and about a 9 percent increase in the share of low-educated men who are single. The increase in the rates of single people corresponds to a decrease in marriage rates among low-educated people.[6] For example, we find that an average increase of $170 in import competition per worker between 1998-2008 led to a 1 percent decline in the marriage rates of low-educated women and men, relative to their baseline marriage rates in 1998. We find little evidence that exposure to trade impacted divorce rates. These results suggest that exposure to import competition did not merely delay the timing of when people married but led to a decrease in marital formation. Compared to the

[5]Erten et al. (2023) found that liberalization of foreign direct investment (FDI) in China led more male and female workers to move out of the agricultural sector and into manufacturing and services. Although the labor market effects of FDI did not vary by gender, they found that exposure to more liberal FDI policies reduced the probability of marriage and the birth rate.

[6]Marriage includes those who are married or are cohabiting and is defined as the number of married men/women in labor market i divided by the population size of the relevant demographic group.

changes in the marriage market of low-educated people, the effects for high-educated people are small and cannot be distinguished from zero.

We conduct several robustness tests. First, the results are similar if we use data on marriage rates from the *Encuesta Demográfica y de Salud Familiar* (ENDES), which is a nationwide survey on the health status of mothers ages 25-45. This is despite the fact that we can only observe a subset of the local labor markets used in the main analysis. The results are also robust to using a younger sample of women indicating that increased import competition impacted the decision to marry, and to using gender-specific trade-exposure measures. Finally, the results are robust to including changes in local labor market characteristics in the period prior to China's accession to the WTO, which indicates that the results are not driven by differential trends across labor markets.

The relationship between import competition and fertility is also theoretically ambiguous. While a decrease in the labor market opportunities of women decreases the opportunity cost of having a child, a decline in income may reduce the demand for children (Lindo, 2010; Cesarini et al., 2017). We use the ENDES data to calculate different measures of fertility, such as the number of births per 1000 women, the age at first birth, and the probability of giving birth before age 19. We find little evidence that exposure to import competition affected fertility decisions. In contrast, Braga (2018), Autor et al. (2019), and Giuntella et al. (2022), who all analyzed shocks that reduced the demand for male workers, found that increased import competition lowered fertility. Keller and Utar (2022) found that Danish women exposed to more import competition in their late 30s were more likely to have an additional child, which they interpret as evidence that the opportunity cost of having children was reduced the most for women near the end of their reproductive years.[7] Differences in the fertility adjustments of women exposed to trade shocks between Peru and Denmark

[7]Several other studies analyzed the relationship between demand shocks, fertility, and marriage (Black et al., 2003; Lindo, 2010; Ananat et al., 2013; Black et al., 2013; Currie and Schwandt, 2014; Schaller, 2016; Kearney and Wilson, 2018; Anelli et al., Forthcoming).

likely reflect the more generous safety net available to Danish workers and other policies that support women with children.

The paper proceeds as follows. Section 2 describes the data sources and the import competition shock to the Peruvian market. Section 3 discusses our empirical strategy. Section 4 reports the main results and the robustness checks. We conclude in Section 5.

2 Background and Data Sources

2.1 Imports from China

After a decade of reform and opening, culminating with China's accession to the WTO, Chinese exports grew massively. No country was exempt from this shock, and Peru was no exception. We consider this surge of Chinese exports an exogenous trade shock to domestic firms in Peru. To measure the influx of Chinese imports to Peru, we use the United Nations COMTRADE dataset for information on product-level trade flows between China and other countries from 1998 to 2008.[8]

Between 1998 and 2008, the inflow of Chinese imports to the Peruvian market was the most salient trade shock experienced by Peruvian firms. During this period, China's imports to Peru grew from $213 millions to $3,233 millions (in 1998 $US), about 1,416 percent increase (Mansour et al., 2022). In comparison, imports to Peru from all other countries only grew by about 157 percent. Moreover, the growth in imports from China to Peru was also significantly larger compared to the growth in imports from China to other Latin American countries.[9]

[8]We use the correspondences of the World Integrated Trade Solution (WITS) from the World Bank to convert six-digit Harmonized Tariff System (HTS) product level codes to CIIU Rev.3, the industry classification in the Peruvian data. See `https://wits.worldbank.org/product_concordance.html`

[9]Between 1998 and 2008, the increase in Chinese imports to Peru's neighboring countries increased by 890 percent. These countries include Argentina, Bolivia, Brazil, Chile, Colombia, and Ecuador (Mansour et al., 2022).

This sudden entry of China into the Peruvian market increased the trade in goods. The increase in imports was not the byproduct of a particular free trade agreement since Peru did not sign these treaties with its main trade partners until the late 2000s. (e.g., 2009 with the United States and 2010 with China). Moreover, foreign direct investment from China did not increase until 2010 and was mainly directed to mining projects.

This shock had a vast and heterogeneous impact on the Peruvian economy as documented by Medina (2022). Panel A of Figure 1 shows the level of Chinese imports in Peru and highlights the significant variation in the exposure to Chinese products across industries. This variation is crucial to our empirical identification strategy, which exploits the temporal change in exposure to imports and the differences in industry composition within and across local labor markets. Panel B shows the increase in Chinese imports as a share of total imports. As can be seen, both the levels and shares of Chinese import competition increased substantially between 1998 and 2008 indicating, once again, that this shock was the most extensive import competition shock during this period.

In principle, our results correspond to the net effect of two forces. First, China's WTO accession represented a significant import competition shock for final goods in the Peruvian economy. Increased import competition in the final goods market is expected to reduce the profits of firms directly competing with Chinese companies and may decrease employment at these firms. Second, China's accession into the WTO could have also reduced the cost of raw materials or intermediate goods for domestic firms. The benefit from a decline in production costs is expected to raise profits and may increase employment at these firms. The effect captured by the import exposure measure we use likely combines the net effect of these two channels.

However, as we show in Appendix Table A1, the share of imports of raw or intermediate goods from China was small during the period we analyze. Specifically, we use data from the World Integrated Trade Solution (WITS) to calculate the share of Chinese imports in raw

materials and intermediate goods (i.e., total imports from China divided by total imports from all origins), and use it to rank China as an import partner. China only represents 0.3% of total raw materials imports by 2010 and occupies the 18th place in the import partner ranking. The share of imports of intermediate goods from China is larger but it increased gradually over time. As we show in the second column of Appendix Table A1, China's share of total intermediate imports was 4.4% in 2002 and increased to 5.7% by 2004. This ranks China as the 7th import partner in this category. It was not until 2011, three years after our sample period ended, that China became the leading import partner of Peru in intermediate goods. Thus, while imports of intermediate goods gained importance over time, China's accession into the WTO had a larger impact on the imports of final goods. This is consistent with the overall (net) negative effects on employment which indicate that competition for final goods is the primary mechanism at play.

2.2 Data

Our primary data source for employment, demographic characteristics, and marital status is the *Encuesta Nacional de Hogares* (ENAHO). The ENAHO is a household survey assembled annually by the Peruvian National Statistics Institute (INEI) and is representative at the national and regional levels. To examine fertility outcomes, we use the *Encuesta Demográfica y de Salud Familiar* (ENDES), a nationwide annual survey also administered by the INEI.[10] The goal of the ENDES survey is to provide nationally representative data on the health status of mothers and young children. It includes three main questionnaires: a household survey, a survey for reproductive-age women (15-49 years old), and a health questionnaire. Importantly for our study, the ENDES records information on reproductive health and fertility. We use the surveys from 2000 and 2008. In the next section we decribe our main sample, define the main outcomes of interest, and provide some summary statistics.

[10]The annual surveys started in 2004, before then the ENDES was conducted in 1996 and 2000.

3 Empirical Strategy

3.1 Local Exposure to Chinese Imports

We conduct the analysis at the local labor market level. Similar to Mansour et al. (2022), we define local labor markets in Peru at the province level, which is the administrative subdivision of a department, the primary geopolitical division in Peru. However, to determine local labor markets in Metropolitan Lima, we follow Piselli (2013), who defines five distinct zones in Metropolitan Lima in which people do most of their activities and contain a subset of districts.[11] This classification results in 146 local labor markets across Peru.

Following Autor et al. (2016), we define import competition exposure at the local labor market as the weighted average of industry changes in Chinese imports per worker, as in,

$$\Delta IPW_{it} = \sum_{j} \frac{L_{ij98}}{L_{i98}} \times \frac{\Delta M_{jt}}{L_{j98}}, \tag{1}$$

where L_{ij98} is the number of employed people in industry j and labor market i, and L_{i98} is the overall number of employed people in labor market i, both measured in 1998, prior to China's entry into the WTO. Thus, when we sum this measure across all industries, the first component of equation (1) measures the baseline industrial composition in labor market i. The second component measures the exposure to Chinese imports by industry. That is, ΔM_{jt} measures the overall national change in Peru's imports from China in industry j between 1998 and year t (in 1998 thousand \$U.S.), relative to the baseline national employment in industry j, L_{j98}. This allocation of national imports per worker to local labor markets amounts to what is typically called the Bartik instrument, following the work of Bartik (1991) and Blanchard and Katz (1992).

We exploit both the temporal and geographic variation in ΔIPW_{it}. As mentioned

[11] The distinct labor markets in Lima are: Lima Center, Lima North, Lima South, Lima East, and Lima West.

before, the increase of Chinese imports by industry and over time is shown in Panel A of Figure 1. The geographical variation in ΔIPW_{it} across regions is shown in Figure 2. The intuition is that local labor markets with a higher employment share in industries that experienced a more considerable rise in Chinese imports will be more exposed than those whose pre-shock employment composition is concentrated in industries not as affected.

As seen in Panel A of Table 1, the average Peruvian labor market experienced a significant increase in imports from China. Between 1998 and 2004, the average increase amounted to \$20 per worker (0.02*1000); by 2008, imports per worker increased by about \$170 (0.17*1000). The import exposure measure varies significantly across labor markets: the difference between the 75th and 25th quartiles corresponds to \$120 per worker.

We also calculate an alternative measure of import exposure that varies by gender as in Autor et al. (2019). These variables are denominated ΔIPW_{it}^{F} and ΔIPW_{it}^{M}, and measure the exposure of female and male workers to trade at the local labor market, respectively. The main difference relative to our aggregate measure of exposure is that the industry components of the shock are weighted by the relative share of female and male workers in the industry and the particular local labor market, as in,

$$\Delta IPW_{it}^{g} = \sum_{j} \frac{L_{ij98}^{g}}{L_{i98}} \times \frac{\Delta M_{jt}}{L_{j98}}, \tag{2}$$

where $g = \{F, M\}$. We report summary statistics about these measures in Panel B of Table 1. On average, female and male workers experienced a similar average increase of about \$10 per worker in Chinese imports between 1998 and 2004. However, the average change between 1998-2008 increased to \$50 per female worker and to \$120 per male worker. Moreover, as is the case with ΔIPW_{it}, these gendered measures of exposure to trade do not correlate with the initial female share at the local labor market level, as seen in Figure 3. This is important as it implies that the trade shock did not systematically impact local labor markets with a baseline higher share of women who participate in the labor market.

3.2 Empirical Model

We estimate the effects of Chinese imports on marital and fertility outcomes at the local labor market level following Braga (2018) and Autor et al. (2019). In our main specification, we aggregate individual-level data at the local labor market level and estimate the following first-difference regression:

$$\Delta Y_{it} = \gamma_{it} + \beta_1 \Delta IPW_{it} + X'_{i98}\beta_2 + \Delta Z'_{i2001-98}\beta_3 + e_{it} \tag{3}$$

where ΔY_{it} is the change in our main outcomes of interest between the baseline year before China's entry into the WTO and year t.[12] Our primary measures for the rates of single and married people calculate the number of male/female single or married individuals divided by their gender-specific corresponding population size in market i. Our main sample includes women ages 25-55, which is the same age group used in Mansour et al. (2022). We construct these variables by gender and education. Table 2 shows the population averages for 1998, 2004, and 2008.

To measure changes in fertility, we focus on a sample of women ages 25-45, and calculate the change in the number of births per 1000 women between 2000 and 2008. In addition, we also examine changes in the share of women with children, age at first birth, and the share of women giving birth before the age of 19. The population averages for these variables between 2000 and 2008 are shown in Table 3.

We control for the vector X'_{i98} which includes labor force and demographic composition measures in 1998, such as the employment share in manufacturing and in the tradable sector, percentage of college-educated, the female employment share, share of married women, and shares of women with biological children. Adding these controls enable us to compare local

[12] In all specifications, we use 1998 as the baseline year to measure ΔIPW_{it} and to calculate the baseline controls. When calculating changes in fertility outcomes from ENDES, however, we use 2000 as the baseline year since no survey was conducted in 1998. The results do not change if we instead calculate changes in import competition between 2000 and 2008 or if the controls are calculated in 2000.

labor markets with similar economic and demographic characteristics at baseline. However, even after the addition of these baseline controls, it is possible that different labor markets were following differential trends before China's accession to the WTO. To alleviate this concern, we check the robustness of results to controlling for the change in the variables included in X'_{i98} between 1998 and 2001 (vector $\Delta Z'_{i2001-98}$). Each observation is weighted by the start of the period population and standard errors are clustered at the local labor market level.

One well-known concern is that this measure will be endogenous if Chinese firms export more to particular industries due to economic reasons also affecting labor market outcomes. In this case, both imports and labor market outcomes will be related but not due to increased import competition. We address the potential endogeneity of ΔIPW_{it} by using Chinese imports to neighboring Latin American countries, such as Chile, Bolivia, Colombia, and Ecuador as an instrument for ΔIPW_{it}. As can be seen in Figure 4 there is a strong positive relationship between Peru's increase in Chinese imports and the changes experienced in other neighboring countries. The F-statistics in all specifications are well above the rule of thumb threshold of 10 for the main measure of ΔIPW_{it} as well as for the gendered exposure measures. Appendix Table A2 shows the corresponding first-stage regressions for the ENAHO and ENDES samples in Panels A and B, respectively. The exclusion restriction is satisfied if we assume that Peru's domestic productivity shocks are not correlated with domestic shocks in other Latin American countries.

Moreover, in our prior work on the gendered labor market effects of exposure to Chinese imports, we provided evidence to further support the validity of the research design. Specifically, Mansour et al. (2022) estimated the weights of the Bartik estimator which identifies the industries that contribute the most to the identifying variation as proposed by Goldsmith-Pinkham et al. (2020). The top five industries whose weights account for over 87 percent of the weights include basic metals, rubber and plastic products, machinery and

equipment n.e.c., other transport equipment, and electrical machinery n.e.c. Importantly, Mansour et al. (2022) show that the shares of these top 5 industries are not correlated with key baseline labor market characteristics, such as the share of female employment, the share of college-educated people, and the employment shares in the manufacturing and tradable sectors.

4 Results

4.1 Labor Market Effects of Import Competition

We start by summarizing the results on the gendered effects of import competition on employment shares which were previously discussed in Mansour et al. (2022). Table 4 reports the main effects on the employment shares of male and female workers, relative to the population of people ages 25-55 in labor market i. The results in Column 2 of Table 4 indicate that an average increase of $20 per worker in import competition between 1998 and 2004 is associated with a 0.29 (0.02*14.707) percentage point decrease in the employment share of low-educated female workers, or about a 0.9 percent decline relative to their average employment share in 1998, although this effect is not statistically significant. The decrease in the employment share of low-educated male workers is significantly smaller and is not estimated with precision.

The decline in the labor demand for low-educated female workers persists when we examine effects between 1998 and 2008. The results in Panel B of Table 4 suggest that an average increase of $170 per worker in import competition led to a 0.39 (0.17*2.283) percentage point decline in the employment share of low-educated female workers, or about 1.2 percent relative to the average employment share in 1998. This effect is statistically significant at the 5 percent level. There is little evidence that exposure to Chinese imports had

persistent negative effect on the employment share of low-educated male workers. Similarly we find no evidence that exposure to imports affected the short- or long-term labor outcomes of high-educated workers.

These aggregate labor market effects mask substantial heterogeneity across the tradable and non-tradable sectors. Specifically, Mansour et al. (2022) found that an average increase of $170 per worker in Chinese imports between 1998 and 2008 is associated with about a 3.7 percent decline in the employment share of female workers in the tradable sector and an increase of about 2.8 percent in their employment share in the non-tradable sector. This reallocation to the non-tradable sector is driven by informal workers, indicating that women are likely moving to lower-quality jobs. Moreover, about 1 percent of low-educated female workers leave the labor force. In contrast, there is no decline in the employment share of male workers in the tradable sector, suggesting that male workers were able to sort into expanding tradable industries. Thus, the results in Mansour et al. (2022) reveal that import competition led to a persistent decline in the demand for low-educated female workers relative to the demand for low-educated male workers.

4.2 Effects of Import Competition on Marriage

The gendered labor market effects of import competition in Peru are likely to influence the gains from marriage and the decision to stay single. Prior studies found mixed evidence on the relationship between trade openness and marriage. For instance, Autor et al. (2019) found that the decline in the employment and earnings of young adult males in the U.S. due to increased Chinese imports led to a decrease in their marriage rates. Keller and Utar (2022) found the opposite result in Denmark, where women exposed to increased import competition were more likely to enter a union and less likely to divorce. In contrast, Braga (2018) and Giuntella et al. (2022) found no relationship between a trade-induced decline in the labor market opportunities of male workers and marriage rates.

Panels A and C of Table 5 examine whether increased import competition to Peru changed the short-term rates of single and married people. The results in Column 2 of Panel A show that between 1998-2004, an average increase of $20 per worker in Chinese imports led to a 0.44 (0.02*21.946) percentage point increase in the rate of single low-educated females, or about a 5 percent increase relative to an average rate of 8.54 in 1998. During the same period, the results in Panel C indicate that exposure to trade led to a 0.61 percentage point decrease in marriage or cohabitation (0.02*30.449), or about a 0.8 percent decrease relative to an average marriage rate of 78.02 percent. Reassuringly, we also find that exposure to trade increased the rates of single low-educated males and decreased their marriage rates (Column 5). Specifically, the results in Column 5 suggest that an average exposure of $20 per worker in import competition between 1998-2004 increased the rates of single low-educated men by about 7 percent (0.02*48.549/13.52) (Panel A) and decreased their marriage rate by about 1 percent (0.02*42.817/83.23) (Panel C). The effects on high-educated female and male workers are significantly smaller in magnitude and are not statistically significant at conventional levels.

Similar to the effects on female employment, the impact on the marriage market persists if we expand the analysis to 2008 (Panels B and D). Specifically, the results in Table 5 indicate that an average increase of $170 per worker in Chinese imports led to an increase of 0.9 percentage point (5.302*0.17) increase in the share of single low-educated females aged 25-55, and a corresponding 0.92 percentage point decrease in their marriage rate (5.428*0.17). This represents an increase of about 11 percent in the the share of singles and a decline of about 1 percent in the marriage rate. Similarly, we find that the same average increase in imports led to a rise of about 9 percent in the share of single low-educated males aged 25-55 (7.151*0.17/13.52) and about a 1 percent decrease in their marriage rates (although this latter effect is not statistically significant). As we report in Appendix Table A3, we find no evidence that exposure to trade increased divorce rates. The results on divorce imply that exposure to trade impacted the rates of marriage not through an increase in separations but

by changing the decision to marry or cohabit among people who were single at the time of exposure.

We conduct several robustness checks. We start by estimating the same regressions using data from ENDES and report these results in Appendix Table A4. Although we observe fewer labor markets in the ENDES data (99 vs. 146), the relationship between exposure to imports and marital formation is remarkably similar across the two data sources. This provides strong evidence that exposure to import competition in Peru led to a lasting decline in marital formation. Furthermore, it is important to check whether local labor markets that were exposed to import competition were already following differential trends before China's entry into the global market. To test this empirically, we control for the change in the variables included in X'_{i98} between 1998 and 2001. The results in Appendix Table A5 confirm that all our findings hold when including pre-trends. Finally, the results in Appendix Table A6, show that the results are robust to including a control for exports per worker. This suggest that our main findings are not driven by changes in competition in foreign markets.[13]

We also report results using gender-specific exposure measures to import competition. The results of Panel B in Column 2 of Table 6 indicate that an average increase of \$50 per female worker in exposure to Chinese imports led to a 5 percent increase in the share of single low-educated females (8.914*0.05/8.54), which is significant at the 1 percent level. Similarly, an average increase of \$120 per male worker is associated with a 5 percent increase in the share of low-educated females, which is significant at the 5 percent level. Moving to the results on marriage rates in Panels C and D, we find that both measures of import exposure reduce the marriage rates of low-educated females, but the effect is only statistically significant for the female-specific exposure measure. Specifically, as seen in Panel D, an average increase of \$50 per female worker reduced the marriage rates of low-educated females by about 0.7

[13]We calculate exposure to exports from Peru to all other countries, including China, similarly to how we construct the import competition measure.

percent (11.647*0.05/78.02).

The results in Column 5 of Table 6 for low-educated men are also consistent with the main results in Table 5. Between 1998-2008, we find that an average increase of $50 per female worker and an average increase of $120 per male worker increased the rate of single low-educated males by about 3 percent (8.941*0.05/13.52) and 5.6 percent (6.4*0.12/13.52), respectively (Panel B). As with the results on females, the effects on marriage rates for low-educated males are only significant for the male exposure measure and indicate that exposure to Chinese imports between 1998-2008 decreased marriage rates by about 1.1 percent (8.095*0.12/83.23), an effect that is significant at the 1 percent level (Panel D).

The decline in the marriage rate of low-educated women is not consistent with the predictions of neoclassical models of marriage, in which a decline in the labor marker opportunities of women relative to men is expected to increase the gains from marriage by increasing the benefits of specialization (Becker, 1973). Instead, they are consistent with a model in which an absolute decline in labor market earnings of either spouse is expected to reduce gains from marriage by reducing the benefits from joint consumption (e.g., children) (Wilson and Neckerman, 1986; Wilson, 1996; Mansour and McKinnish, 2014).

4.3 Effects of Import Competition on Fertility

We next examine whether exposure to import competition impacted the fertility outcomes of Peruvian women. In Table 7, we examine two fertility outcomes using the ENDES data set: The share of women ages 25-45 who have children and the number of births per 1000s women of this age group. Focusing on the full sample in Panel A, there is little evidence that the increase in import competition changed the share of women who have children (the extensive margin). In fact, the results are small in magnitude, not statistically significant, and do not change if we limit the sample to women ages 25-35 (Panel B) or women ages

35-45 (Panel C). There is suggestive evidence that import exposure reduced the number of births per 1000s women, implying that the income effect dominates the effect of reducing the opportunity cost of having children. For instance, the results in Column 4 of Table 7 indicate that an average increase of $170 imports per worker reduced the number of births per 1000s low-educated women by about 6 percent (0.17*37.678/108.09) relative to the average in 2000. Still, this effect is not statistically different from zero. Interestingly, despite the lack of precision, the magnitude of the effect is substantially larger for the older group (Panel C), indicating a possible decline in completed fertility. We also examine the effect of exposure to import competition on the age at first birth. The results in Column 2 and 4 of Table 8 suggest that the change in imports per worker had little effect on the age at first birth of low-educated women and on their probability of having a child before the age of 19.[14]

These results are different that the evidence found by Keller and Utar (2022), where exposure to trade increased fertility rates for women in Denmark. In their case, the authors conclude that import competition decreased the opportunity cost of having children for women close to the end of the reproductive age, thus, increasing the likelihood of having a newborn. Although it is also likely that the trade shock reduced the opportunity cost of having children for Peruvian women, the loss in income and limited access to a robust safety net may have reduced their demand for children.

5 Conclusions

Like many other countries around the globe, the accession of China to the WTO in 2001 led to a substantial increase in Chinese imports to Peru. As we documented in Mansour et al. (2022), exposure to import competition led to a persistent decline in the employment share

[14]These findings are robust to the inclusion of pre-trends as we show in Appendix Tables A7 and A8. The results using gender-specific exposure measures, which we report in Appendix Table A9, also provide little evidence that the increase in import competition had an effect on fertility.

of low-educated female workers while having a more negligible and mostly transient effect on the employment share of low-educated male workers.

In this paper, we examine whether the trade-induced labor market adjustments of male and female Peruvian workers impacted long-term marriage and fertility rates. We contribute to the literature on the demographic effects of import competition by analyzing the consequences of a trade shock that disproportionately affected the labor market outcomes of female workers. This is in contrast to prior studies that focused on trade shocks that adversely impacted the labor market outcomes of male workers (Braga, 2018; Autor et al., 2019; Giuntella et al., 2022). Importantly, in contrast to Keller and Utar (2022), we examine these effects in the context of a developed country with limited access to the social safety net and different gender norms.

Our empirical approach uses variation in the baseline industrial composition across labor markets and changes in Chinese imports between 1998 and 2008 (Topalova, 2007; Autor et al., 2013; Dix-Carneiro and Kovak, 2017). To ensure that we are identifying the effects of the trade-induced labor demand shock from other domestic shocks to productivity, we instrument our import exposure measure using changes in Chinese imports to Peru's neighboring countries (Autor et al., 2013).

The results indicate that, by 2008, markets with a higher exposure to import competition had a higher share of low-educated single men and women and a lower marriage rate. This is consistent with a model in which the decrease in the gains from joint consumption associated with marriage dominates the potential increase in the gains from household specialization. We find little evidence that the increase in import competition impacted fertility decisions.

The implications of the gendered labor market effects of trade are likely to extend further from their impact on marital formation and fertility. Notably, a decline in the relative economic position of wives is likely to impact their bargaining power and have important

implications on parental investments in children's human capital and health. We leave these questions for investigation in future work.

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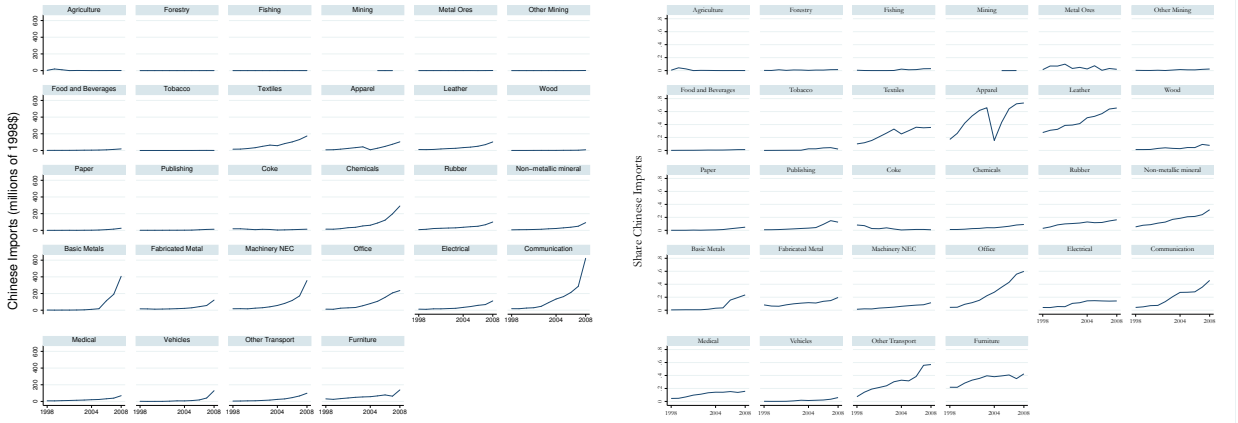
6 Figures

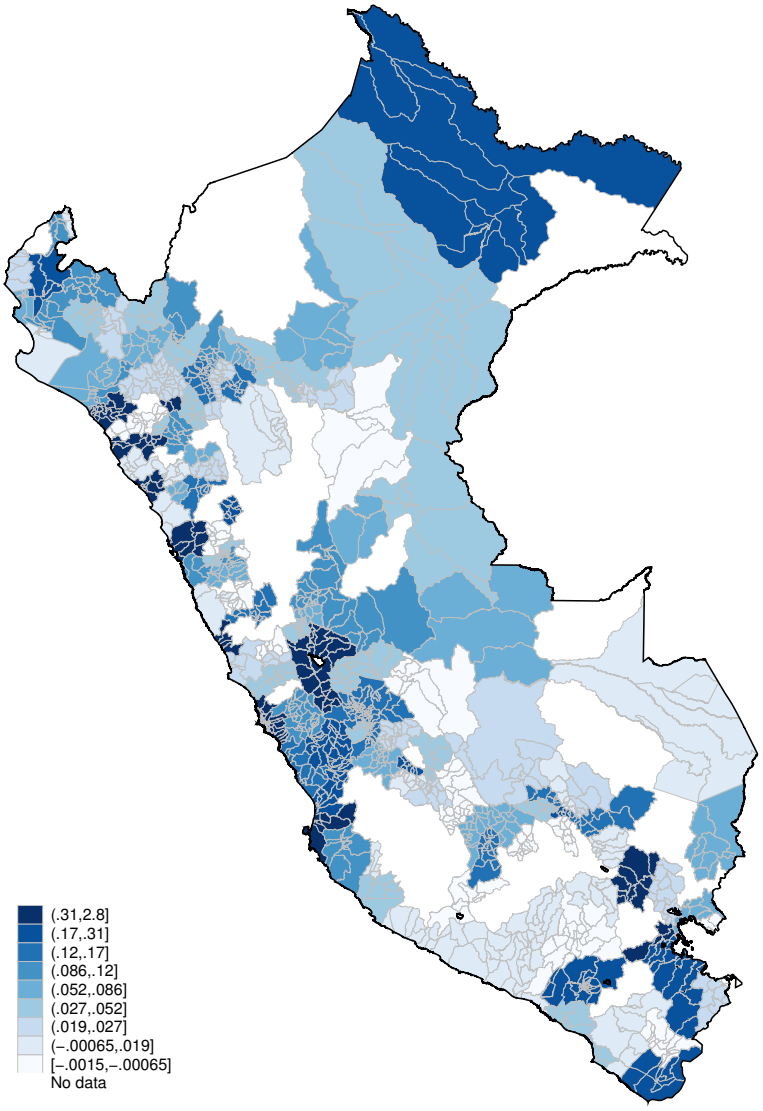
Figure 1: Chinese Imports by Industry



(a) Chinese Imports **(b)** Chinese Import Shares

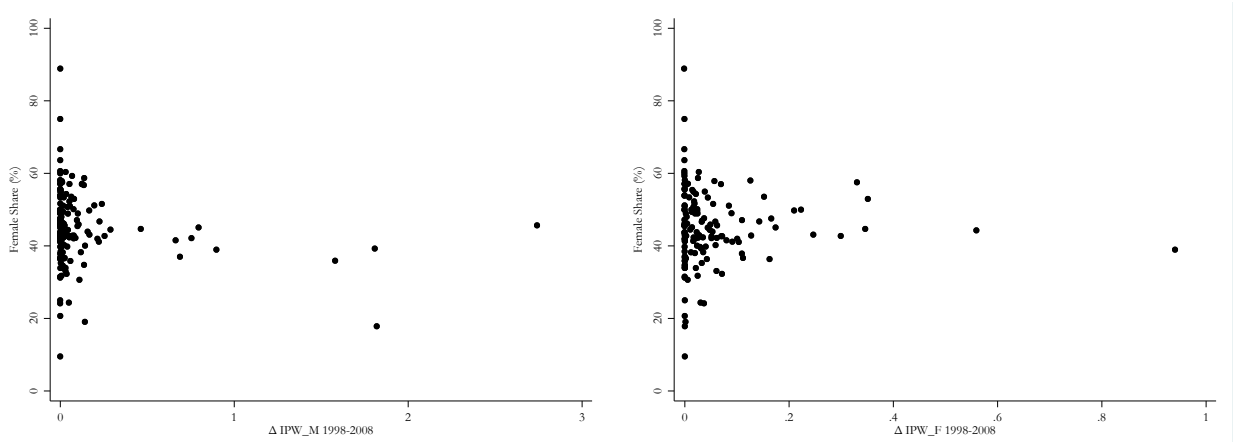
Notes: Industries are defined at the two-digit CIIU Rev 3.1. level. Panel (a) shows the level of Chinese imports in Peru in millions of 1998 dollars. Panel (b) plots the share of Chinese imports relative to imports to Peru from any origin country. Source: UN Comtrade.

Figure 2: ΔIPW by Local Labor Market



Source: ENAHO and UN Comtrade.
Notes: The map depicts the value of ΔIPW from 1998 to 2008 for all local labor markets considered in the analysis. Darker color means the local labor market was exposed to more import competition, while lighter ones reflect low exposure. Regions in white correspond to provinces for which ENAHO did not collect data in 1998 and 2008. Units of ΔIPW are in thousands of US dollars of 1998 per worker.

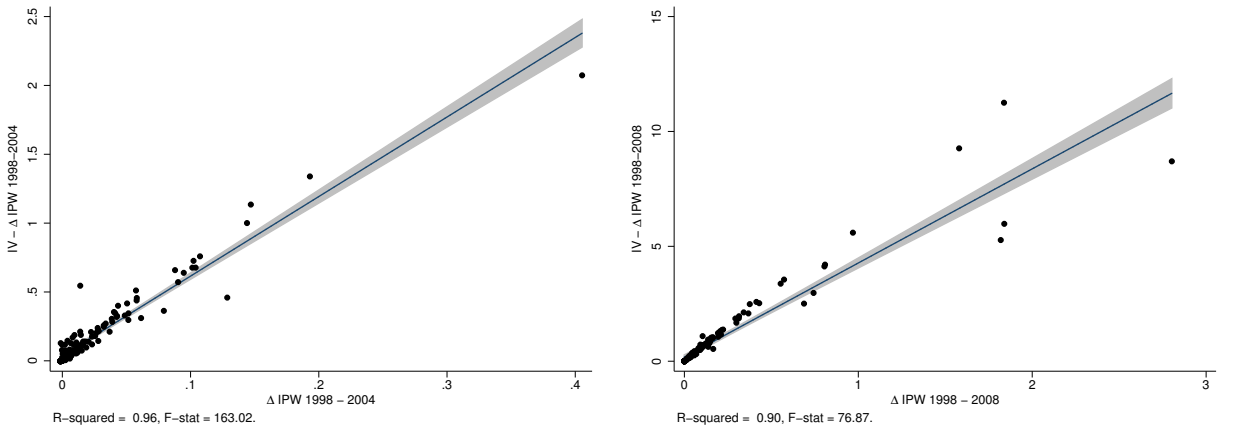
Figure 3: Gendered Trade Shock and Baseline Female Composition



(a) Males **(b)** Females

Notes: Panels (a) and (b) show the raw correlation between the share of female employment in 1998 and the import competition measure for males and females, respectively. The unit of observation is the local labor market. Source: ENAHO and UN Comtrade.

Figure 4: Instrumental Variable First-Stage



(a) 1998-2004 **(b)** 1998-2008

Notes: Panels (a) and (b) show the raw correlation between the share of female employment in 1998 and the import competition measure for males and females, respectively. The unit of observation is the local labor market. Source: ENAHO and UN Comtrade.

7 Tables

Table 1: Import Penetration per Worker (in thousands of US dollars)

A: Δ *IPW*

	Mean	Median	S.Dev.	p75-p25	N
Δ IPW 98-04	0.02	0.01	0.05	0.03	146
Δ IPW 98-08	0.17	0.05	0.39	0.12	146

B: Δ *IPW_F &* Δ *IPW_M*

Δ IPW_F 98-04	0.01	0.00	0.03	0.01	146
Δ IPW_F 98-08	0.05	0.02	0.11	0.05	146
Δ IPW_M 98-04	0.01	0.00	0.03	0.01	146
Δ IPW_M 98-08	0.12	0.01	0.36	0.08	146

Notes: Data sources are COMTRADE and ENAHO. Where ΔIPW is defined following equation (1), and the gendered measures according to equation (2).

Table 2: Descriptive Statistics on Labor Market Outcomes and Marital Outcomes, By Gender

	Female			Male		
	1998	2004	2008	1998	2004	2008
Labor Force Participation	68.2	74.2	76.5	94.4	95.1	95.8
Employment Rate						
All	65.7	71.3	73.9	91.9	92.4	93.8
Low-Educated	65.0	70.9	73.3	93.7	93.8	94.8
High-Educated	70.5	72.8	74.9	90.9	89.5	91.5
Marriage Rate						
All	76.1	75.4	75.8	80.8	76.9	77.0
Low-Educated	78.0	78.6	79.1	83.2	79.4	79.7
High-Educated	59.7	57.4	58.8	71.7	66.5	65.4
Single Rate						
All	10.9	11.5	11.5	15.6	18.1	17.3
Low-Educated	8.5	8.2	8.2	13.5	15.5	14.2
High-Educated	28.4	30.7	28.3	23.6	29.3	29.6

Notes: Data source is ENAHO. Rates are defined as the ratio between the number of working-age (25-55) individuals employed/married/single in a demographic group divided by the population in the given demographic group, multiplied by 100.

Table 3: Descriptive Statistics on Fertility Outcomes

	2000	2008
Share of Women with Children		
All	89.22	87.75
Low-Educated	93.68	93.69
Number of Births per 1000 women		
All	98.96	85.14
Low-Educated	96.18	83.91
Age at First Birth		
All	20.72	21.07
Low-Educated	19.94	20.11
Probability of First Birth before 19 years old		
All	0.41	0.38
Low-Educated	0.49	0.49

Notes: Data source is ENDES. All variables are defined for women between 25-45 years old. Share of women with children refers to the number of women with at least one child divided by the population in the given demographic group, multiplied by 100. The number of births per 1000 women refers the total births over the last year divided by the population in the given demographic group, multiplied by 1000. The age at first birth is the age of the women when it gave birth for the first time. Finally, the probability of first birth before 19 years old is the share of women for which the age at first birth is lower or equal than 19 years old, relative to the population in the given demographic group.

Table 4: Effect of Trade Shock on Employment Shares
Dependent Variable: Total Group Employment / Total LLM Pop * 100

	Female			Male		
	(1) All	(2) Low-Edu	(3) High-Edu	(4) All	(5) Low-Edu	(6) High-Edu
A. IV-Regressions (1998-2004)						
Δ IPW	-9.705**	-14.707	4.289	-10.670**	-4.038	-4.651
	(4.937)	(11.525)	(8.910)	(5.111)	(8.605)	(8.248)
B. IV-Regressions (1998-2008)						
Δ IPW	-2.106**	-2.283**	0.276	-1.531	-0.683	-0.590
	(0.942)	(1.140)	(0.941)	(0.946)	(1.148)	(1.111)
Mean Y in 98	36.98	31.80	5.18	43.83	35.44	8.40
Baseline Controls	X	X	X	X	X	X
Sample Size	146	146	146	146	146	146

Notes: Data are from the 1998-2008 ENAHO. The dependent variable is the difference in the total group employment share between 2008-1998 at the local labor market level, where employment share is defined as the ratio between the number of working-age (25-55) individuals employed in a local labor market divided by the population in the given labor market, multiplied by 100. A marginal increase Δ IPW should be interpreted as an increase in one thousand dollars per worker. The mean Δ IPW between 1998 and 2008 is 0.17, and the interquartile change form the 25th to the 75th percentile is 0.12. Baseline controls include: share of females, share of college graduates, share of workers in the tradable sector, and share of workers in the manufacture sector. F-stats for the fist-stage range from 101 to 107. Each observation is weighted by 1998 local labor market population. Standard errors clustered at the local labor market level in parentheses.* p<0.10, ** p<0.05, *** p<0.01.

Table 5: Effect of Trade Shock on Marital Status Rates
Dependent Variable: Total Group Marital Status / Total Group LLM Pop * 100

	Female			Male		
	(1) All	(2) Low-Edu	(3) High-Edu	(4) All	(5) Low-Edu	(6) High-Edu
			Single Rate			
A. IV-Regressions (1998-2004)						
Δ IPW	21.910*	21.946***	36.305	36.403***	48.549***	9.922
	(12.406)	(5.899)	(48.021)	(12.895)	(12.225)	(26.389)
B. IV-Regressions (1998-2008)						
Δ IPW	3.856*	5.302***	4.701	5.941*	7.151***	1.555
	(2.297)	(1.527)	(8.060)	(3.359)	(2.625)	(5.129)
Mean Y in 98	10.86	8.54	28.41	15.60	13.52	23.61
Baseline Controls	X	X	X	X	X	X
Sample Size	146	146	111	146	146	120
			Married Rate			
C. IV-Regressions (1998-2004)						
Δ IPW	-29.323***	-30.449**	-56.486	-34.091**	-42.817**	-8.374
	(10.602)	(14.592)	(45.047)	(14.524)	(20.612)	(26.108)
D. IV-Regressions (1998-2008)						
Δ IPW	-4.839**	-5.428**	-9.598	-4.051	-4.915	0.499
	(2.437)	(2.295)	(6.950)	(3.627)	(3.360)	(5.805)
Mean Y in 98	76.05	78.02	59.68	80.86	83.23	71.74
Baseline Controls	X	X	X	X	X	X
Sample Size	146	146	111	146	146	120

Notes: Data are from the 1998-2008 ENAHO. The dependent variable is the difference in the total group marital status share between 2008-1998 at the local labor market level, where marital status share is defined as the ratio between the number of working-age (25-55) individuals with a determined marital status in a local labor market divided by their population in the given labor market, multiplied by 100. A marginal increase Δ IPW should be interpreted as an increase in one thousand dollars per worker. The mean Δ IPW between 1998 and 2008 is 0.17, and the interquartile change form the 25th to the 75th percentile is 0.12. Baseline controls include: share of females, share of college graduates, share of workers in the tradable sector, and share of workers in the manufacture sector. F-stats for the fist-stage range from 101 to 107. Each observation is weighted by 1998 local labor market population. Standard errors clustered at the local labor market level in parentheses.* p<0.10, ** p<0.05, *** p<0.01.

Table 6: Effect of Trade Shock on Marital Status Rates
Gendered Specific Trade Shocks
Dependent Variable: Total Group Marital Status / Total Group LLM Pop * 100

	Female			Male		
	(1) All	(2) Low-Edu	(3) High-Edu	(4) All	(5) Low-Edu	(6) High-Edu
			Single Rate			
A. IV-Regressions (1998-2004)						
Δ IPW_F	30.016	30.086***	12.854	5.247	11.490	-18.548
	(19.908)	(10.208)	(72.951)	(29.964)	(20.501)	(69.275)
Δ IPW_M	8.210	8.189	76.719	89.063	111.184**	55.890
	(32.728)	(25.761)	(118.759)	(70.747)	(45.048)	(140.466)
B. IV-Regressions (1998-2008)						
Δ IPW_F	2.572	8.914***	-5.818	7.655	8.941*	1.428
	(4.531)	(2.659)	(15.717)	(5.619)	(4.587)	(7.825)
Δ IPW_M	4.394	3.787**	9.538	5.222	6.400**	1.610
	(2.931)	(1.821)	(8.415)	(3.790)	(3.078)	(5.875)
Mean Y in 98	10.86	8.54	28.41	15.60	13.52	23.61
Baseline Controls	X	X	X	X	X	X
Sample Size	146	146	111	146	146	120
			Married Rate			
C. IV-Regressions (1998-2004)						
Δ IPW_F	-47.243*	-48.799	-34.489	-5.539	7.663	-9.174
	(26.176)	(31.554)	(76.242)	(28.339)	(29.841)	(63.504)
Δ IPW_M	0.963	0.564	-94.394	-82.349	-128.136**	-7.082
	(54.322)	(62.887)	(138.490)	(70.348)	(55.432)	(131.614)
D. IV-Regressions (1998-2008)						
Δ IPW_F	-6.729	-11.647***	-0.711	-0.559	2.671	-3.811
	(4.451)	(3.993)	(12.185)	(6.275)	(5.651)	(8.249)
Δ IPW_M	-4.046	-2.820	-13.685	-5.515	-8.095**	2.340
	(3.442)	(2.946)	(8.632)	(4.232)	(3.525)	(6.985)
Mean Y in 98	76.05	78.02	59.68	80.86	83.23	71.74
Baseline Controls	X	X	X	X	X	X
Sample Size	146	146	111	146	146	120

Notes: Data are from the 1998-2008 ENAHO. The dependent variable is the difference in the total group marital status share between 2008-1998 at the local labor market level, where marital status share is defined as the ratio between the number of working-age (25-55) individuals with a determined marital status in a local labor market divided by their population in the given labor market, multiplied by 100. A marginal increase Δ IPW should be interpreted as an increase in one thousand dollars per worker. The mean Δ IPW between 1998 and 2008 is 0.17, and the interquartile change form the 25th to the 75th percentile is 0.12. Baseline controls include: share of females, share of college graduates, share of workers in the tradable sector, and share of workers in the manufacture sector. Each observation is weighted by 1998 local labor market population. Standard errors clustered at the local labor market level in parentheses.* p<0.10, ** p<0.05, *** p<0.01

Table 7: Effect of Trade Shock on Fertility

	Share of Women with Children		N. Births per 1000s	
	(1) All	(2) Low-Edu	(3) All	(4) Low-Edu
A. Full Sample				
Δ IPW	0.057	0.031	-42.425	-37.678
	(0.053)	(0.039)	(50.720)	(50.561)
Mean Y in 2000	0.92	0.95	110.84	108.09
B. Sample 25-35				
Δ IPW	0.094	0.054	-26.987	-24.233
	(0.067)	(0.044)	(41.255)	(34.101)
Mean Y in 2000	0.89	0.93	140.13	143.76
C. Sample 35-45				
Δ IPW	0.027	0.012	-37.588	-53.161
	(0.042)	(0.038)	(66.910)	(69.275)
Mean Y in 2000	0.96	0.97	74.45	72.65
Sample Size	98	98	98	98

Notes: Data are from the 2000-2008 ENDES. The dependent variable in Columns (1) and (2) is the change of the share of women with children at the local labor market between 2000 and 2008. The dependend variable in Columns (3) and (4) is the change in the number of births per 1000 women between 2000 and 2008. Each variable is calculated for all women and for low-educated ones (up to secondary education). Baseline controls include: share of females, share of college graduates, share of workers in the tradable sector, and share of workers in the manufacture sector. Each observation is weighted by 1998 local labor market population. F-stats of the first-stage regression are 77. Standard errors clustered at the local labor market level in parentheses.* p<0.10, ** p<0.05, *** p<0.01

Table 8: Effect of Trade Shock on Age at First Birth

	Age at First Birth		Prob. Birth before 19yo	
	(1) All	(2) Low-Edu	(3) All	(4) Low-Edu
A. Full Sample				
Δ IPW	0.170	0.324	-0.037	-0.027
	(0.966)	(0.864)	(0.145)	(0.131)
Mean Y in 2000	20.30	19.77	0.45	0.51
B. Sample 25-35				
Δ IPW	-0.104	0.074	0.001	-0.027
	(1.031)	(1.015)	(0.139)	(0.131)
Mean Y in 2000	20.00	19.49	0.45	0.51
C. Sample 35-45				
Δ IPW	0.703	0.858	-0.104	-0.027
	(0.854)	(0.698)	(0.153)	(0.131)
Mean Y in 2000	20.76	20.22	0.45	0.51
Sample Size	98	98	98	99

Notes: Data are from the 2000-2008 ENDES. The dependent variable in Columns (1) and (2) is the change of average age of the mother at her first birth at the local labor market between 2000 and 2008. The dependend variable in Columns (3) and (4) is the change in the probability of a birth before the mother is 19 years old between 2000 and 2008. This probability is defined by the share of women with first birth at ages 19 or younger relative to the relevant population of women. Each variable is calculated for all women and for low-educated ones (up to secondary education). Baseline controls include: share of females, share of college graduates, share of workers in the tradable sector, and share of workers in the manufacture sector. Each observation is weighted by 1998 local labor market population. F-stats of the first-stage regression are 77. Standard errors clustered at the local labor market level in parentheses.* p<0.10, ** p<0.05, *** p<0.01

Appendix For Online Publication

Table A1: Intermediate Imports from China

	Raw Materials	Intermediate Goods
	Share Imports China	Share Imports China
2000	1.0%	3.0%
2002	0.2%	4.4%
2004	0.1%	5.7%
2008	0.1%	14.2%
2010	0.3%	15.4%

Notes: The first column of this table shows the share of Chinese imports of raw materials, relative to all imports of raw materials to Peru. The second column shows the same share but considering intermediate inputs.

Table A2: First-Stage Regressions Sample

	(1) Δ IPW	(2) Δ IPW_F	(3) Δ IPW_M
	A. ENAHO Sample		
Δ IPW IV	0.365***		
	(0.035)		
Δ IPW_F IV		0.258***	-0.015
		(0.007)	(0.023)
Δ IPW_M IV		0.002	0.450***
		(0.008)	(0.031)
F-test	211	589	81
Sample Size	147	147	147
	B. ENDES Sample		
Δ IPW IV	0.362***		
	(0.037)		
Δ IPW_F IV		0.261***	-0.014
		(0.009)	(0.026)
Δ IPW_M IV		-0.002	0.447***
		(0.008)	(0.036)
F-test	269	551	56
Sample Size	99	99	99

Notes: Data are from the 1998-2008 ENAHO and from the 2000-2008 ENDES. The dependent variable is Δ IPW between 1998 and 2008. Baseline controls include: share of females, share of college graduates, share of workers in the tradable sector, and share of workers in the manufacture sector. Each observation is weighted by 1998 local labor market population. Standard errors clustered at the local labor market level in parentheses.* p<0.10, ** p<0.05, *** p<0.01.

Table A3: Effect of Trade Shock on Divorce Rates
Dependent Variable: Total Group Divorce Status / Total Group LLM Pop * 100

	Female			Male		
	(1) All	(2) Low-Edu	(3) High-Edu	(4) All	(5) Low-Edu	(6) High-Edu
IV-Regressions (1998-2004)						
Δ IPW	9.992	9.369	12.705	-0.734	-1.359	-5.625
	(9.083)	(8.934)	(15.929)	(8.225)	(12.343)	(9.091)
IV-Regressions (1998-2008)						
Δ IPW	0.603	-0.817	3.805	-1.811*	-1.844	-2.702
	(1.339)	(1.177)	(3.210)	(1.062)	(1.830)	(1.813)
Mean Y in 98	7.97	7.63	10.68	2.56	2.24	4.10
Baseline Controls	X	X	X	X	X	X
Sample Size	146	146	111	146	146	120

Notes: Data are from the 1998-2008 ENAHO. The dependent variable is the difference in the total group marital status share between 2008-1998 at the local labor market level, where marital status share is defined as the ratio between the number of working-age (25-55) individuals with a determined marital status in a local labor market divided by their population in the given labor market, multiplied by 100. A marginal increase Δ IPW should be interpreted as an increase in one thousand dollars per worker. The mean Δ IPW between 1998 and 2008 is 0.17, and the interquartile change form the 25th to the 75th percentile is 0.12. Baseline controls include: share of females, share of college graduates, share of workers in the tradable sector, and share of workers in the manufacture sector. F-tests for the first stage range from 101.58 to 106.53. Each observation is weighted by 1998 local labor market population. Standard errors clustered at the local labor market level in parentheses.* p<0.10, ** p<0.05, *** p<0.01.

Table A4: Effect of Trade Shock on Marriage Rates using ENDES sample of LLMs
Dependent Variable: Total Group Marital Status / Total Group LLM Pop * 100

	Female			Male		
	(1) All	(2) Low-Edu	(3) High-Edu	(4) All	(5) Low-Edu	(6) High-Edu
			Single Rate			
A. IV-Regressions (1998-2004)						
Δ IPW	16.526	23.323***	15.455	43.754***	55.836***	-9.213
	(10.934)	(6.317)	(39.085)	(13.245)	(13.591)	(29.322)
B. IV-Regressions (1998-2008)						
Δ IPW	4.492*	6.375***	2.495	7.873**	8.938***	2.518
	(2.707)	(1.670)	(7.521)	(3.462)	(2.685)	(5.244)
Mean Y in 98	11.34	9.26	25.85	16.01	13.30	25.99
Baseline Controls	X	X	X	X	X	X
F-test	96.49	96.49	93.48	96.49	96.49	93.40
Sample Size	99	99	78	99	99	88
			Married Rate			
C. IV-Regressions (1998-2004)						
Δ IPW	-26.327***	-33.604***	-34.524	-35.529**	-42.420**	8.082
	(8.439)	(10.484)	(35.358)	(14.581)	(19.709)	(30.392)
D. IV-Regressions (1998-2008)						
Δ IPW	-5.212**	-5.986***	-7.993	-6.116	-6.668*	-1.001
	(2.509)	(2.159)	(6.796)	(3.823)	(3.722)	(6.066)
Mean Y in 98	75.72	77.57	63.33	79.99	83.29	68.00
Baseline Controls	X	X	X	X	X	X
F-test	96.49	96.49	93.48	96.49	96.49	93.40
Sample Size	99	99	78	99	99	88

Notes: Data are from the 1998-2008 ENAHO. The dependent variable is the difference in the total group marital status share between 2008-1998 at the local labor market level, where marital status share is defined as the ratio between the number of working-age (25-55) individuals with a determined marital status in a local labor market divided by their population in the given labor market, multiplied by 100. A marginal increase Δ IPW should be interpreted as an increase in one thousand dollars per worker. The mean Δ IPW between 1998 and 2008 is 0.17, and the interquartile change form the 25th to the 75th percentile is 0.12. Baseline controls include: share of females, share of college graduates, share of workers in the tradable sector, and share of workers in the manufacture sector. F-tests for the first stage range from 91.04 to 95.10. Each observation is weighted by 1998 local labor market population. Standard errors clustered at the local labor market level in parentheses.* p<0.10, ** p<0.05, *** p<0.01

Table A5: Effect of Trade Shock on Marriage Rates
Including Pre-Trends
Dependent Variable: Total Group Marital Status / Total Group LLM Pop * 100

	Female			Male		
	(1) All	(2) Low-Edu	(3) High-Edu	(4) All	(5) Low-Edu	(6) High-Edu
			Single Rate			
A. IV-Regressions (1998-2004)						
Δ IPW	18.729	18.900***	-5.712	26.194***	34.796***	2.557
	(12.506)	(6.091)	(35.371)	(9.698)	(7.366)	(22.219)
B. IV-Regressions (1998-2008)						
Δ IPW	1.707	4.203***	-2.930	2.947	4.259**	4.281
	(1.738)	(1.307)	(7.008)	(2.371)	(1.951)	(4.552)
Mean Y in 98	10.86	8.54	28.41	15.60	13.52	23.61
Baseline Controls	X	X	X	X	X	X
Δ(2001-1998) Controls	X	X	X	X	X	X
F-test	96	96	90	96	96	88
Sample Size	143	143	109	143	143	118
			Married Rate			
C. IV-Regressions (1998-2004)						
Δ IPW	-23.143**	-24.444	-12.926	-20.842**	-26.860**	1.205
	(10.476)	(16.037)	(34.945)	(8.965)	(13.543)	(23.146)
D. IV-Regressions (1998-2008)						
Δ IPW	-2.590	-4.435*	-3.329	-1.108	-2.559	-1.291
	(1.901)	(2.298)	(6.618)	(2.712)	(2.892)	(5.349)
Mean Y in 98	76.05	78.02	59.68	80.86	83.23	71.74
Baseline Controls	X	X	X	X	X	X
Δ(2001-1998) Controls	X	X	X	X	X	X
F-test	96	96	90	96	96	88
Sample Size	143	143	109	143	143	118

Notes: Data are from the 1998-2008 ENAHO. The dependent variable is the difference in the total group marital status share between 2008-1998 at the local labor market level, where marital status share is defined as the ratio between the number of working-age (25-55) individuals with a determined marital status in a local labor market divided by their population in the given labor market, multiplied by 100. A marginal increase Δ IPW should be interpreted as an increase in one thousand dollars per worker. The mean Δ IPW between 1998 and 2008 is 0.17, and the interquartile change form the 25th to the 75th percentile is 0.12. Baseline controls include: share of females, share of college graduates, share of workers in the tradable sector, and share of workers in the manufacture sector. F-tests for the first stage range from 91.04 to 95.10. Each observation is weighted by 1998 local labor market population. Standard errors clustered at the local labor market level in parentheses.* p<0.10, ** p<0.05, *** p<0.01

Table A6: Effect of Trade Shock on Marriage Rates
Including Δ EPW between 1998 and 2008
Dependent Variable: Total Group Marital Status / Total Group LLM Pop * 100

	Female			Male		
	(1) All	(2) Low-Edu	(3) High-Edu	(4) All	(5) Low-Edu	(6) High-Edu
			Single Rate			
A. IV-Regressions (1998-2004)						
Δ IPW	21.939*	22.826***	30.065	34.413***	45.397***	12.229
	(12.329)	(5.900)	(46.396)	(12.642)	(11.674)	(26.562)
B. IV-Regressions (1998-2008)						
Δ IPW	4.226*	5.516***	4.333	6.557*	7.857***	1.648
	(2.512)	(1.553)	(8.096)	(3.413)	(2.661)	(5.205)
Mean Y in 98	10.86	8.54	28.41	15.60	13.52	23.61
Baseline Controls	X	X	X	X	X	X
Δ EPW	X	X	X	X	X	X
F-test	114	114	105	114	114	108
Sample Size	146	146	111	146	146	120
			Married Rate			
C. IV-Regressions (1998-2004)						
Δ IPW	-28.213***	-29.715**	-59.766	-31.751**	-39.032**	-11.456
	(10.706)	(14.635)	(45.514)	(14.171)	(19.902)	(26.080)
D. IV-Regressions (1998-2008)						
Δ IPW	-5.522**	-6.027***	-9.377	-4.728	-5.691	0.517
	(2.503)	(2.129)	(6.984)	(3.781)	(3.697)	(5.903)
Mean Y in 98	76.05	78.02	59.68	80.86	83.23	71.74
Baseline Controls	X	X	X	X	X	X
Δ EPW	X	X	X	X	X	X
F-test	114	114	105	114	114	108
Sample Size	146	146	111	146	146	120

Notes: Data are from the 1998-2008 ENAHO. The dependent variable is the difference in the total group marital status share between 2008-1998 at the local labor market level, where marital status share is defined as the ratio between the number of working-age (25-55) individuals with a determined marital status in a local labor market divided by their population in the given labor market, multiplied by 100. A marginal increase Δ IPW should be interpreted as an increase in one thousand dollars per worker. The mean Δ IPW between 1998 and 2008 is 0.17, and the interquartile change form the 25th to the 75th percentile is 0.12. Baseline controls include: share of females, share of college graduates, share of workers in the tradable sector, and share of workers in the manufacture sector. F-tests for the first stage range from 91.04 to 95.10. Each observation is weighted by 1998 local labor market population. Standard errors clustered at the local labor market level in parentheses.* p<0.10, ** p<0.05, *** p<0.01

Table A7: Effect of Trade Shock on Fertility Outcomes Including Pre-Trends

	Share of Women with Children		N. Births per 1000s	
	(1) All	(2) Low-Edu	(3) All	(4) Low-Edu
A. Full Sample				
Δ IPW	0.058	0.029	-42.266	-38.230
	(0.052)	(0.037)	(49.632)	(48.556)
Mean Y in 2000	0.92	0.95	110.84	108.09
B. Sample 25-35				
Δ IPW	0.094	0.050	-26.565	-25.021
	(0.065)	(0.041)	(41.181)	(33.244)
Mean Y in 2000	0.89	0.93	140.13	143.76
C. Sample 35-45				
Δ IPW	0.028	0.013	-36.724	-52.978
	(0.042)	(0.037)	(66.273)	(67.883)
Mean Y in 2000	0.96	0.97	74.45	72.65
Sample Size	97	97	97	97

Notes: Data are from the 2000-2008 ENDES. The dependent variable in Columns (1) and (2) is the change of the share of women with children at the local labor market between 2000 and 2008. The dependend variable in Columns (3) and (4) is the change in the number of births per 1000 women between 2000 and 2008. Each variable is calculated for all women and for low-educated ones (up to secondary education). Baseline controls include: share of females, share of college graduates, share of workers in the tradable sector, and share of workers in the manufacture sector. They also include pre-trends in the share of female and the share of employment on the tradable sector. F-stats of the first-stage regression range from 77.22 to 77.33. Each observation is weighted by 1998 local labor market population. Standard errors clustered at the local labor market level in parentheses.* $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Table A8: Effect of Trade Shock on Fertility Outcomes (cont.)
Including Pre-Trends

	Age at First Birth		Prob. Birth before 19yo	
	(1) All	(2) Low-Edu	(3) All	(4) Low-Edu
A. Full Sample				
Δ IPW	0.165	0.329	-0.038	-0.029
	(0.931)	(0.833)	(0.139)	(0.127)
Mean Y in 2000	20.30	19.77	0.45	0.51
B. Sample 25-35				
Δ IPW	-0.106	0.082	0.003	-0.029
	(1.004)	(0.994)	(0.136)	(0.127)
Mean Y in 2000	20.00	19.49	0.45	0.51
C. Sample 35-45				
Δ IPW	0.712	0.876	-0.111	-0.029
	(0.809)	(0.657)	(0.142)	(0.127)
Mean Y in 2000	20.76	20.22	0.45	0.51
Sample Size	97	97	97	98

Notes: Data are from the 2000-2008 ENDES. The dependent variable in Columns (1) and (2) is the change of average age of the mother at her first birth at the local labor market between 2000 and 2008. The dependend variable in Columns (3) and (4) is the change in the probability of a birth before the mother is 19 years old between 2000 and 2008. This probability is defined by the share of women with first birth at ages 19 or younger relative to the relevant population of women. Each variable is calculated for all women and for low-educated ones (up to secondary education). Baseline controls include: share of females, share of college graduates, share of workers in the tradable sector, and share of workers in the manufacture sector. They also include pre-trends in the share of female and the share of employment on the tradable sector. F-stats of the first-stage regression range from 77.22 to 77.33. Each observation is weighted by 1998 local labor market population. Standard errors clustered at the local labor market level in parentheses.* $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Table A9: Effect of Trade Shock on Fertility Using Gendered Specific Trade Shocks

	Age at First Birth		Prob. Birth before 19yo	
	(1) All	(2) Low-Edu	(3) All	(4) Low-Edu
A. Full Sample				
Δ IPW_F	-0.434	-0.473	0.064	0.074
	(1.840)	(1.516)	(0.259)	(0.236)
Δ IPW_M	0.520	0.684	-0.082	-0.072
	(0.987)	(0.833)	(0.135)	(0.119)
B. Sample 25-35				
Δ IPW_F	-1.390	-1.211	0.163	0.074
	(1.835)	(1.724)	(0.248)	(0.236)
Δ IPW_M	0.550	0.628	-0.088	-0.072
	(1.062)	(0.961)	(0.140)	(0.119)
C. Sample 35-45				
Δ IPW_F	0.935	0.799	-0.089	0.074
	(1.659)	(1.204)	(0.263)	(0.236)
Δ IPW_M	0.682	0.874	-0.083	-0.072
	(0.880)	(0.662)	(0.128)	(0.119)
Sample Size	98	98	98	99

Notes: Data are from the 2000-2008 ENDES. The dependent variable in Columns (1) and (2) is the change of average age of the mother at her first birth at the local labor market between 2000 and 2008. The dependend variable in Columns (3) and (4) is the change in the probability of a birth before the mother is 19 years old between 2000 and 2008. This probability is defined by the share of women with first birth at ages 19 or younger relative to the relevant population of women. Each variable is calculated for all women and for low-educated ones (up to secondary education). Baseline controls include: share of females, share of college graduates, share of workers in the tradable sector, and share of workers in the manufacture sector. Each observation is weighted by 1998 local labor market population. Standard errors clustered at the local labor market level in parentheses.* p<0.10, ** p<0.05, *** p<0.01