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Is female labor immobility holding back industrialization in Pakistan?[a]

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Abstract

Pakistan has not had much success with labor-intensive export growth. It also has one of the world's lowest rates of female labor force participation and low intersectoral mobility of female labor. This paper explores links between these two phenomena. From national household survey data we find that in a plurality of households, the senior male member retains authority over decisions concerning women's activities, and that women's lack of autonomy is correlated with their labor force status. We then use a trade-theoretic model to show that in the aggregate, restricting female mobility limits the gain from a positive export shock by reducing potential for specialization in labor-intensive manufacturing. Analysis of labor force data from years before and after an EU decision to lower tariffs on garment imports from Pakistan reveals no meaningful change in the composition of employment or the participation of women, a sharp contrast with experience in otherwise similar countries.

Keywords: Pakistan, female wage labor, specific factors model, purdah, GSP+

JEL classification: F16, O14, J16, J62

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I. Introduction

For many decades, Pakistan's per capita growth rate has lagged behind its South Asian neighbors and comparable Southeast Asian countries (Figure 1). Though it is the world's sixth most populous country, it has failed to exploit its comparative advantage in labor-intensive industries and exports (Hasan (2015:33). The share of manufacturing in GDP remains low. The share of manufactures in merchandise exports is lower in the 2020s than in the 1990s, and on average just one-third that of regional neighbors.[1] Pakistan's overall share in world trade has diminished even as those of all other South Asian countries have increased.[2] FDI inflows are tiny, averaging just 1.2% of GDP annually in 2000-2019, and of those inflows, only a small fraction goes into manufacturing (WTO 2015).

No single factor can explain this sustained poor performance. Poor governance, weak institutions, inappropriate trade and macroeconomic policies, inadequate investment in education, health, and physical infrastructure, low productivity growth, political instability, large defense expenditures, and conflicts in and with neighboring countries are all frequently mentioned.[3] Each of these is a potentially important cause of slower growth, but none is unique to Pakistan. Indeed, countries like Cambodia and Bangladesh have managed to achieve considerable export success despite facing comparable challenges.

In this paper we focus on one area in which Pakistan has a stronger claim to differ from its peers. We ask whether barriers to female labor mobility, related to socio-cultural norms of *purdah* as practiced in Pakistan, play a role in that country's failure to launch export-oriented industrialization based on labor-intensive manufacturing. Despite being much studied at household level, barriers to female labor mobility, an aspect of the wider issue of gender inequality, are seldom given deep consideration in economic analysis of industrialization and economic growth. As we discuss below, gender discrepancies in formal labor force participation, particularly in factory employment, in Pakistan are so large that it would be

[1] Though it is higher than in the 1990s, all the increase took place in one spell from 2000-2008. For more detail and analysis see the appendix to this paper.

[2] Instead, reflecting the lack of employment opportunities within the country, Pakistan has become an exporter not of labor-intensive products, but of labor itself. In each recent year before 2020, almost 1m Pakistanis from an active labor force of about 57m have travelled abroad for work. Remittances, primarily from blue-collar workers in Persian Gulf countries, are larger in value than any single merchandise export item and in 2020 accounted for 8.7% of GDP (The World Bank Databank, accessed on December 10, 2022).

[3] See, for example, IMF 2016. Pakistan's record of labor productivity growth is exceptionally low. In the 2000s it averaged 1.34 per cent per year, less than half that of Bangladesh and one-third that of India.

surprising if they were not to have measurable macroeconomic effects. It is intuitive that the absence of a high proportion of women from the wage labor force and/or restrictions on women's mobility across industries and occupations should reduce the country's productive potential and its comparative advantage in labor intensive production, increase the dependency ratio, and thereby limit capacity for gains from globalization.[4]

In section II of this paper we present a brief exploration of comparative and historical data, and evidence on the existence and persistence of restrictions on the movement of female labor into factory-based industrial employment. In section III we explore household decision-making data relevant to female labor force participation. In section IV we offer a relatively simple model of production, factor allocation and factor returns in an open economy with limits on labor mobility. Although highly stylized, this model is sufficient to explore the main implications of constraints on female labor mobility. It generates several propositions, including the prediction that a positive trade shock will have only limited benefits for labor-intensive manufactures if there are strong restrictions on entry of women into industrial employment. In section V we directly examine the prediction using labor force data from before and after a major positive trade policy shock, the EU's 2013 expansion of the GSP+ system of preferential access for Pakistan's exports. In a concluding section we assess implications and suggest some directions for future research.

II. Perspectives on globalization and women's labor force participation

If the expansion of formal manufacturing industry creates a ladder to economic growth, then in poor countries the first steps typically involve labor-intensive light manufactures. Among these, apparel and related industries such as footwear have historically been very prominent. Apparel manufacturing has some of the lowest requirements in terms of capital, technology, skills and complementary infrastructure. Until very recently it has resisted significant automation. The industry has been and continues to be characterized by very high female-male employment ratios. Women account for two-thirds of the apparel industry workforce in Indonesia and China, and 80% or more in Bangladesh, Sri Lanka, Cambodia and Vietnam. Countries that have succeeded as apparel exporters have not been paragons of open trade

[4] To fix ideas, consider a simple numerical exercise using a Cobb-Douglas aggregate production function with a labor share of 0.6. Pakistan's FLFPR, around 25%, is roughly half the middle-income average. Doubling it would increase Pakistan's labor force by about 12.5% and national output (other things equal) by 7.5%. Increasing FLFPR to that in Vietnam, 73%, would raise national output by about 15%, other things equal.

policy and good governance, but they have been successful in mobilizing large numbers of women into factories located in cities and industrial zones. In this respect, India (22.5%) and Pakistan (28%) are clear outliers (van Klaveren 2016).

Trade data highlight Pakistan's modest record in apparel exports. The left panel of Figure 2 shows that in three decades from 1990 Pakistan's apparel exports barely increased relative to other labor-abundant economies. In the right panel, Pakistan's record of textile exports is somewhat stronger (the country is a large producer of cotton), but even this growth record is unremarkable. As already seen, Pakistan has also lagged in recruitment of women to work in the industry (ILO 2016).[5] These two phenomena are clearly related, and causality may run both ways. In this section, we identify some supply-side constraints on female labor force participation and mobility.

Paid employment by Pakistani women is among the lowest rates in the world. The 2013-14 Pakistan Labor Force Survey (LFS) showed that in a total employed labor force of 46m, women supplied just 11m workers (24%). Cultural norms relating to women's behavior and social interactions, among other and interrelated phenomena, contribute to low female labor force participation. Most well-known among these in South Asia is purdah, the practice of gender segregation in public spaces, achieved mainly by limiting female behavior.[6] The practice itself is a set of behavioral rules based on principles of gender segregation and female seclusion, which

> … serve to divide and therefore define spaces: the public and private, the exterior and interior, the male and female. Private interior spaces demarcate the realm of women, while public exterior spaces are reserved for men. The contours of these spaces vary in different classes and regions, but as an internalized belief system—an ideology—purdah mediates between all women and the outside world, governing their lives, defining what is possible and by extension what is not (Shaheed 1989:18).

Female seclusion is widespread in South Asia. Although specific practices and the rigor of their observation are not uniform, the institution undoubtedly constrains women's

[5] We include textiles exports even though in Pakistan, most of what is exported from the textile industry is produced in capital-intensive processes using cheap feedstock from the domestic economy, such as cotton yarn. The category also includes carpets, however, which are made using more labor-intensive techniques.

[6] The word purdah (from the Persian word for a veil or curtain) is defined in dictionaries as "the practice in certain Hindu and Muslim societies of screening women from men or strangers" (Oxford) or "the seclusion of women from public observation among Muslims and some Hindus, especially in India" (Merriam-Webster). Female seclusion is widely practiced in South Asia but is not associated with any specific religion. In India, its prevalence varies more by region than by religion (Jejeebhoy and Sathar 2001). Neither the meaning nor the practice of purdah is consistent across space or time, rendering its connections to behavior difficult to identify or quantify (ADB/ILO 2016; World Bank 2005).

participation in economic life, notably their access to economic resources and employment opportunities (Shaheed 1989:17). For many, it limits women's economic activities to those that can be performed in or nearby to the family home, and attaches a stigma to mixed-gender spaces including workplaces such as factories (Haque 2009; Makino 2014[7]). The ubiquity of this practice in a country like Pakistan is reflected in, and leads to, many other factors that inhibit female wage labor participation. For example, women in Pakistan and in parts of India face great challenges in commuting on public transport, and in working in a mixed workplace (ADB 2016; Sajjad et al. 2017; Seki and Yamada 2020; Field and Vyborny 2022).

Consistent with these constraints, women in Pakistan not only have low wage labor participation rates but are also less spatially mobile, even after controlling for actual or potential labor force participation. Conditional on labor force participation—that is, for a minority of working-age women—almost 80% of women report availability for work only within the household or the village, and almost none for work outside their district of residence (ADB 2016). Internal migration for employment or business by women is almost non-existent. Women make up more than half the population of internal migrants but of these, only 6% report moving for economic reasons while over 90% move either for marriage or to accompany spouses or other family members (Cheema and Coxhead 2022).

An additional consequence of low mobility and limits on wage employment is that women's sectoral employment options are also circumscribed. In 2017, agriculture accounted for 71% of female employment, a figure which by comparison with other South Asian countries is both much higher and also not trending downward over time. The comparable figure for men is just 28%.[8] Only 14% of Pakistan's female labor force is employed in industry. Women make up 39% of the labor force in agriculture; 22% of that in community, social and personal services; 20% in manufacturing, and just 1-3% in other sectors including transportation, wholesale and retail trade, finance, insurance and banking, and utilities (Zaidi et al. 2016, fig. 3.7).

At the extensive margin, women's mobility into the labor force is also low in Pakistan. The elasticity of female labor force participation with respect to wages is estimated at just 0.16;

[7] Makino (2014) presents results of a survey in one of Pakistan's most important garment-producing cities, Faisalabad, and finds that "It is primarily household-side factors, rather than factory-side factors, that prevent women from working in Pakistan's garment sector" (p.167).

[8] Of course, a substantial fraction of Pakistan's male labor force is also employed overseas, another option in which women's participation is extraordinarily low.

similar to India (0.19) but much lower than Bangladesh (0.31) or Sri Lanka (0.89) (Lopez-Avecedo and Robertson 2016, Ch.4).

Related to these constraints, female educational attainment overall is low relative to men, and the gender gap in earnings at each level of education is notably wide. In addition, Pakistani women who participate in paid employment also experience very substantial wage discrimination (Aslam 2009; Majid 2020).

Differential rates of participation, mobility and education are among the factors contributing to a wide and persistent gap between women's and men's earnings. On average, women's earnings on an hourly equivalent basis over all occupations are about 50% those of men, before taking account of differences in skills, experience and promotion (Zaidi et al. 2016:112). The highest wage gaps and lowest earnings ratios are seen in low and medium skill occupations such as skilled agricultural work and craft and related trade work, including production-line manufacturing and construction (Zaidi et al. 2016: Table 6.2).[9] The ILO has observed that Pakistan's gender pay gap in garments, textiles and footwear sectors is highest by far among comparable countries (ILO 2016).[10] Nor is there evidence that the gender wage gap is closing over time (ADB 2016), which contradicts trends in similar countries undergoing globalization. The international literature is divided on the impact of globalization on the gender wage gap, but very few rigorous analyses find evidence of a widening gap due to trade or FDI.[11] Once again, Pakistan is an Asian exception.

[9] An Oaxaca-Blinder decomposition in the same study reports a very high contribution from factors other than endowments, i.e., discrimination.

[10] In these industries the ILO study estimates the gender pay gap in Pakistan at about 50%, compared with almost 40% in India, 25% in Thailand, and 9-16% in Indonesia, Vietnam and Cambodia (ILO 2017).

[11] Oostendorp (2009), using international cross-section data, finds that trade and FDI either reduce the gender wage gap or have insignificant effects in lower-income countries. In a comparative study, Lee and Wie (2017) found that gender wage equality in India was "dramatically improved" during the 1990s-2000s, but worsened in China over the same period. However, another China study using more detailed enterprise-level data found that while gender wage gaps are large across the board, the growth of foreign-owned and export-oriented industries strongly promoted women's employment and showed lower wage gaps and less wage discrimination against women, while the gaps and discrimination observed in non-exporting firms remain wide (Chen et al. 2013). Recent studies of Bangladesh, the country most similar to Pakistan in many respects, find evidence of substantial reductions in the gender wage gap in the past two decades, consistent with a pattern of structural change in which the demand for women's labor has risen faster than that for men. Ahmed and McGillivray (2015) found the gender wage gap had fallen by 31% between 1999 and 2009, due to improvements in women's human capital and lower discrimination against women, especially at the lower end of the earnings distribution. Robertson et al. (2020a) identified a similar decline resulting from the expansion of factory-based employment in the ready-made garment sector. Other empirical studies of globalization, or of countries undergoing globalization confirm that while gaps due to both productivity differentials and discrimination are persistent, trade and FDI tend either to reduce them or at worst, to leave them unchanged (see, for example, Fang and Sakellariou 2015). In a study of the Indian manufacturing economy, Menon and Rodgers (2009) do find evidence of a

Pakistan's GSP+ export "shock"

Pakistan's garment industry experienced a significant positive trade shock when the EU voted to award GSP+ status effective January 1, 2014.[12] Prior to 2014, Pakistan's exports to the EU were governed by standard GSP rules. For ready-made garments (RMG) nearly all EU GSP tariff lines were 9.6%, whereas all are 0% under GSP+. For other important Pakistani exports, such as carpets and other finished textiles, the GSP rates were mostly around 5.5 – 6.5%, and GSP+ rates are all 0%.[13] At approximately the same time, Pakistan garment and textile sector trade policies were revised to increase duty drawbacks, lower the costs of export financing through the State Bank of Pakistan, and introduce concessional investment support for new plant and equipment in the sectors.[14]

This trade shock is qualitatively comparable to others studied in the literature. Edmonds et al. (2010) studied the impacts of India's late 1980s trade policy reforms on district-level employment and poverty. Heath and Mobarak (2015) traced the effects of abolition of the global garment export quota system known as the Multi-Fiber Arrangement on women's employment in the Bangladesh ready-made garment industry. Goutam et al. (2017) examined the effects of trade shocks on formal and informal employment in Bangladesh. McCaig and Pavcnik (2018) studied the effects of the US-Vietnam Bilateral Trade Agreement, which involved an average external tariff drop of 20.9 percentage points, on female labor market transitions in that country. Robertson et al. (2020a) examined the effects of abolition of the Multifiber Arrangement on the supply of women's labor in the Bangladesh garment industry, and Robertson et al. (2020b) studied the effects of globalizing trends on women's wages and employment in the garment sectors of Sri Lanka and Cambodia. Both the latter studies find significant wage premia for women in the garment industry relative to other industries, and that those premia rise as exports increase.

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widening gender wage gap, which they attribute to institutional differences in the bargaining power of women and men in the wage labor market.

[12] GSP (the Generalized System of Preferences) is a set of importing-country policies that apply tariff reductions and some other concessions on imports from developing country trade partners. GSP+ broadens and deepens these concessions in return for exporting country commitments to ratify and effectively implement a set of 27 core international conventions on human and labor rights, environmental protection and good governance. Compliance is periodically verified and certified by an EU panel.

[13] These tariff rates are based on data reported at six-digit level (HS17) in the WTO tariff download facility (tariffdata.wto.org, last accessed 1 March 2021).

[14] According to information from the Pakistan Board of Investment, "Sector Profile: Textiles", https://invest.gov.pk/textile#gallery, last accessed 1 November 2021, and Pakistan Readymade Garments Manufacturers and Exporters Association, https://www.prgmea.org/, last accessed 1 November 2021.

The set of changes associated with the 2014 EU award of GSP+ status to Pakistan is not as large overall as those affecting Bangladesh or Vietnam in the studies cited above. It is, for example, in percentage terms roughly half the magnitude of the Vietnam shock studied by McCaig and Pavcnik (2018). However, GSP+ changes are disproportionally concentrated in the garment and textile sectors. At the time that GSP+ was awarded, the EU was Pakistan's largest export market, absorbing 36% of its exports, and garments and textiles accounted for 82% of the value of this trade. Under GSP+ more than 76% of Pakistan's exports, including garments and textiles, could enter the EU duty and quota free. Thus, GSP+ eliminated external tariffs on almost 20% of Pakistan's global merchandise exports, including about half of its garment exports.[15]

Even allowing for a scaled-down shock, however, most data indicate that Pakistan did not gain greatly from GSP+ (for a detailed analysis see Khan 2017). Importantly, there is little evidence of a supply response among industries most clearly benefiting from GSP+. The quantity of ready-made garment exports shipped varies greatly from year to year, but the average growth rate between 2013-14 and 2017-18, 7.7% per year, was about the same as that over a longer interval, 2009-10 to 2019-20 (7.6% per year).[16] There are some small indications of a positive investment response, as seen in net FDI into the textile sector. Although there was zero net FDI in textiles in 2014 (the first year of the GSP+ award), inflows picked up sharply in subsequent years, and textiles as a share of total net FDI doubled (roughly speaking) in 2015-18 relative to 2007-2012. However, the gain was from an extremely low initial level, from 1% to 2% of total inward FDI (Figure 3).

Pakistan's exports to the EU show no clear sign of a post-GSP+ increase—even in the garment sector (Figure 4). The seeming lack of an export supply response is a stark contrast with the Bangladesh experience following abolition of MFA (Figure 5).[17]

III. Cultural restrictions on female labor force participation

[15] https://ec.europa.eu/trade/policy/countries-and-regions/countries/pakistan/, last accessed April 30 2020.

[16] Calculated using RMG quantities (thousands of dozens of items) from commerce.gov.pk, accessed 27 April 2021. Overall textile exports (reported in the same source in value terms) grew much more slowly, by about 2.8% per year between 2009-10 and 2019-20.

[17] Makino (2014) provides a nuanced comparison of Pakistan and Bangladesh following MFA quota phaseout and identifies the lack of women workers in the garment industry—and a sluggish labor market response to new job opportunities for women—as one important factor contributing to differential outcomes. Her study identifies the seclusion of women as one element in a cluster of cultural, social and economic constraints on female wage labor participation.

Pakistan's experience prompts the question of why female participation in formal employment has not responded more strongly to potential market opportunities. In the early stages of industrialization, resistance to female factory employment was common across widely different cultural settings, from the US, UK and Europe through Japan and Taiwan to Indonesia and Bangladesh, but in these countries social norms have altered in the course of development.[18] In Pakistan, this process may have been slowed by adoption of highly conservative social policies, especially during the regime of President Zia ul-Haq (1978-1988). But it is also likely that changes in social norms are constrained by a generational gap in decision-making power, and dynamically, by lack of incentive to innovate. In this section we examine evidence on decision-making at household level. We compare this evidence in years before and after the GSP+ award.

Women's wage-labor participation and cultural factors before and after GSP+

We noted earlier that cultural factors symbolized by purdah are often pointed out as the reason for low numbers of Pakistani women working in the ready-made garment sector. Do such factors play a similar role before and after GSP+? We estimate an empirical model of wage-labor participation for Pakistani women with key explanatory variables representing cultural factors using microdata from the Pakistan Social and Living Standards Measurement Survey (PSLM) from years before and after GSP+ status was achieved.

Data

Although labor market studies are best conducted using LFS, that survey is not rich in household-level data. PSLM is conducted by the same government bureau that conducts LFS, and their database structure and sampling design are highly comparable (PBS 2007, PBS 2013b, PBS 2020). The PSLM section on "Women in decision making", which is not available in LFS, contains potential proxy variables for cultural factors that vary at the household/individual level. We associate these variables with women's employment status. We confirm that gender-age-region profiles of labor force participation are highly similar

[18] See Honeyman and Goodman (1991) for a detailed discussion of the European experience, including the textile and garments industries that became highly feminized during the 19th century and Haller and Hoellinger (1994) discuss how and to what extent gender norms changed over time with economic changes in US, UK and several European countries. Tsurumi (1994) describes how a call to serve the nation was used to overcome resistance and attract young Japanese women to the silk mills in the 1870s. In Bangladesh, women adapted their dress to facilitate factory employment (Nazneen (1996). See Saxonhouse and Wright (1984) for comparisons of the Japanese and US experiences, Wolf (1990) for a comparison of Java (Indonesia) and Taiwan, Kabeer (2016) for a discussion of the process in Bangladesh and more generally in South Asia.

between LFS and PSLM.[19] Therefore, we judge that labor force participation information in PSLM is broadly comparable with LFS.

From the available survey rounds, we choose PSLM 2005-06 and 2011-12 as the years before the EU award and PSLM 2018-19 as the year after the EU award. As our concern is with non-agricultural wage employment for females, which would be expanded as export-oriented apparel and textile industries develop, we limit our focus in this subsection to such types of female employment, excluding agricultural work and self-employment. In PSLM 2018-19, the ratio of women aged 15-49 employed in non-agriculture was just 9.8%, only slightly higher than in 2011-12 (9.2%) and 2005-06 (8%) (Table 1). With this low participation rate, the number of observations of women employed in textile and apparel manufacturing industries is too small to be analyzed separately. Once a woman works as a paid employee in some non-agricultural industry, we can expect her to move to apparel factories more easily, when earning conditions in apparel manufacturing improve, than non-working females or females working as an unpaid family worker in their family farm. This expectation justifies our focus on all non-agricultural employment by women.

Table 1 about here

The PSLM section on "Women in decision making" has 10 questions asked to women aged 15-49 years (there is no direct mention of purdah in the survey). Answers to these ten questions are highly correlated, so we focus on the question that was answered by the largest number of women: "Who in your household decides whether you can start or continue to get education?" For answers, there are seven exclusive choices; these range from "Household head or the woman's father decides alone" to "Woman herself." We define the *traditional* dummy = 1 if the answer is "Household head or the woman's father decides alone," and the *empowered* dummy = 1 if the answer is "Woman herself". As shown in Table 1, in PSLM 2018-19, as many as 42.2% of women had traditional dummy=1 while mere 8.8% of women had empowerment dummy=1. These percentages are surprisingly stable over three rounds of PSLM spanning 14 years. As expected, the percentage of women employed in non-agriculture is lower among those with traditional dummy=1 and higher among those with empowerment dummy=1. So a tentative answer to the question posed at the start of this section is that in a plurality of cases, limitations on female mobility are likely to be

[19] A comparison of LFS and PSLM regarding the labor force participation rate is available on request.

attributable to cultural factors that change over generations (if at all), regardless of signals from the labor market.

To further check this, we regress a dummy for female labor force participation by individual woman aged 15-49 on the *traditional* and *empowered* variables, along with other covariates. To reduce endogeneity bias and to better capture the inherent social preferences of the household, we replace the individual-level variables reported in Table 1 with household-level aggregates. In our regressions, the *traditional* dummy is equal to one if *all* women aged 15-19 in the household report that decisions are made by the father or husband alone. For the *empowerment* variable, we assign a value of 1 at household level if *any* woman in the household reports that she alone makes decisions. By construction, these two variables are mutually exclusive. In PSLM 2018-19, the mean of *traditional* was 0.108 and that *empowered* was 0.375. Other explanatory variables include age, education, and regional fixed effects.

The OLS estimation results are shown in Table 2. To judge the significance of coefficients, cluster-robust standard errors are employed, with primary sampling units (mostly villages/wards) as the cluster. The coefficients on *empowered* are highly significant. In PSLM 2018-19, the female non-agricultural employment probability is lower by 2.18 percentage points for households in which all women have no decision-making power in education, while it is higher by 4.88 percentage points for households in which some women have empowerment. As the average of all observations is 9.8 percentage points, these effects are strikingly large, approximately -22% and +50% against the mean. In PSLM 2011-12 and PSLM 2005-06, the correlation is similar: the female non-agricultural employment probability is significantly lower for households in which all women have no decision-making power in education, whereas it is significantly higher for households in which some women have empowerment. When we replace the two dummy variables by continuous household-level averages of *traditional* and *empowered*, the empirical results are highly similar in a qualitative sense. More importantly, the absolute value of the coefficient on *traditional* is highly stable across all three rounds, with *F*-tests consistently accept the null hypothesis of parameter stability. As the absolute value of the coefficient on *empowered* increased in the last available round, the joint test for parameter stability is rejected when we simultaneously examine two parameters.

Table 2 about here

Coefficients on controls (age, education, and regional dummies) show expected patterns and are highly stable across three rounds. A note may be needed regarding the non-linear pattern of coefficients on education. Throughout the period we analyze, the probability of employment is significantly higher among highly educated women (tertiary education) than among women having no or primary education by 16 to 19 percentage points, whereas the coefficient on the secondary education dummy (completing 8th-12th grades) is significantly negative in PSLM 2018-19 and 2011-12. This appears to suggest that the share of jobs that are regarded detrimental to the purdah norm within non-agricultural jobs but suitable for females with middle-level education is increasing over time. The robust significance of the *traditional* variable, and the prevalence of this condition over households, indicates that for many women in Pakistan, entering the wage labor force may not be an option they are free to explore, even if labor market conditions are attractive.

Discussion

Comparing the correlates of women's non-agricultural wage employment focusing on social factors in years prior to and following the EU award of GSP+ status, we find that conservative norms continue to inhibit female labor force participation outside of agriculture in roughly similar ways. Both the prevalence of such norms and their marginal contribution to the reduction in labor force participation are stable across survey rounds. The prevalence rates remained similar before and after the EU award; we fail to reject the null hypothesis that the coefficients on the traditional dummy are the same before and after the EU award.

We do find some evidence of change, although not very substantial. The marginal contribution of women's empowerment to female labor force participation shows a significant increase after the EU award (Table 2). This may suggest a possibility that the EU award changed the way women are encouraged to enter non-agricultural employment if they belong to a family with a liberal norm regarding women's choice in their education. At the same time, as seen in Table 1, the prevalence of such a norm did not increase after the EU award; it actually decreased. To clearly identify longer-term changes in decision-making patterns and link them to social norms such as purdah is left for future research.

IV. Implications of limited wage labor participation and mobility: a specific factors model

In this section we explore some implications of limits on female labor force participation and mobility in the context of a trade shock in which prices of goods produced in some sectors rise relative to those produced in others. We show that such limits contribute to resource

misallocation and diminished labor productivity, reduce the potential aggregate gains from increased trade.[20]

There are many possible ways to model the effects of a trade shock on an economy with limited labor mobility. Here we offer one that is appealing for its parsimony. In neoclassical trade theory, the distinction between short and long run is often captured by degrees of intersectoral factor mobility. A long-run equilibrium is one in which all factors are reallocated so as to equate the value of their marginal product across all sectors. In the short run, at least one factor is assumed to be specific to (i.e., immobile out of) the sector in which it is employed.

Sector-specific factors are the residual claimants on revenue net of payments to mobile factors. In a competitive market with constant returns to scale, pure profits are zero and all revenues after tax and intermediate costs are distributed as payments to factors. Suppose labor is mobile while capital is fixed in each sector; labor mobility means that in equilibrium there is a wage, w_L, at which the economy-wide labor market will clear. Denoting output and price in sector j by y_j and p_j, and labor and capital inputs by L_j and K_j with prices w and r_{Kj}, the zero-profit condition in terms of value-added is:

$$p_j y_j = wL_j + r_{Kj}K_j. \tag{1}$$

Restating this expression in proportional changes of variables (for example, $\hat{w} = dw/w$):

$$\hat{p}_j = \hat{w}\theta_{Lj} + \hat{r}_{Kj}\theta_{Kj}, \tag{2}$$

where $\theta_{Lj} = wL_j/p_j y_j$ is the share of revenues paid to labor, and $\theta_{Kj} = 1 - \theta_{Lj}$is the share paid to the specific factor or factors. It follows that with numeraire price $p_2 = 1$ (so $\hat{p}_2 = 0$), when labor is intersectorally mobile a rise in the price of good 1 results in changes in factor returns relative to output prices, ordered as:

$$\hat{r}_{K2} \leq \hat{p}_2 = 0 \leq \hat{w} \leq \hat{p}_1 \leq \hat{r}_{K1} \tag{3}$$

(Jones 1971). In the short-run case, returns to the same factor may differ across sectors and may change in different ways in response to shocks from prices, technology or endowments. In general, returns to sector-specific factors always follow the fortunes of the sector to which

[20] The model contrasts male and female labor but is generally applicable to any labor market in which one subset of participants experiences exogenous constraints on participation and/or mobility.

they belong, while returns to mobile factors are determined as weighted averages of the sectors among which they can move.

The trade model setup can readily be reinterpreted to produce a stylization of the Pakistan case. First, as discussed elsewhere in this paper, informality is a key feature of the Pakistan labor market. More than 70% of non-agricultural employment is informal (the figure for agricultural employment is much higher). Workers in informal employment are lower-paid, less productive, and less secure (ILO 2022). Outside of government and advanced professions such as medicine, law, finance and banking, most formal employment in Pakistan is in manufacturing, in which the textile and garment industry has a prominent share.

Second, we can assume that production in each sector uses both male and female labor in addition to any intrinsically sector-specific capital or land; that is, production technology in each sector has the form $y_j = y_j(L_j^m, L_j^f, K_j)$, where superscripts indicate male and female labor. In our model male workers are always mobile between sectors, while women's labor is either specific to a given industry or as a counterfactual, is intersectorally mobile in the same way that men are. Thus men's wages are determined by intersectoral labor market clearing, while women's labor, along with any sector-specific capital, is the residual claimant on sectoral revenues. When women are immobile between sectors, wage gaps result from inter-sectoral differences in the value of their labor's marginal product.[21] The economy-wide gender wage gap is the ratio of the men's wage to an index of women's earnings with sectoral employment share weights. To summarize, our stylized economy consists of two sectors: informal—mainly agriculture, small enterprises and home-based employment—and formal, mainly manufacturing, and especially textiles and garments. And we have two types of labor: male, always mobile; and female, either attached to one or the other sector, or in a counterfactual, fully mobile.

Our comparison of the immobile and mobile equilibria repurposes a two-sector trade model by Mayer (1974). When comparing mobile and immobile equilibria, the key insights are found in Mayer's Figure 1 (adapted here as Figure 6), and the proofs supporting them are all found in the same article. The figure shows a production possibilities frontier in product space, where y_1 and y_2 are the two goods produced. We can think of y_1 as the formal manufacturing sector, and y_2 as the informal sector, mainly though not exclusively

[21] There is an important intermediate case, in which women workers change sectors only if the wage gap becomes large enough to overcome some (potentially non-market) barrier to mobility; to keep things simple, we note this possibility without incorporating it in our model.

agriculture. The production possibilities frontier *FF* shows combinations of y_1 and y_2 that can be produced under full employment given factor endowments and technologies. As usual, the efficient production mix is found where the marginal rate of transformation between outputs is equal to their relative price, such as point *A* with price $-p_A = -p_1/p_2$ with $p_2 = 1$ as the numéraire price.

In trade theory, *FF* is a long-run envelope of short-run frontiers, each of which shows combinations of outputs that can be produced under full employment. Consider the initial equilibrium at *A*, associated with relative price $-p^A$. This tangency is also the optimal resource allocation on a short-run (or, immobile female labor) frontier *aa*. To see the effects of labor mobility restrictions, consider an increase in *p,* to $-p^B$. If all labor is mobile, the new equilibrium will be at *B* on *FF*. If some labor is not mobile, however, adjustment is constrained by the short-run frontier *aa* and the new equilibrium is instead at *b*. Compared with *FF*, the constrained PPF *aa* is more highly convex from above.[22] Any move around *FF* away from *A* can be decomposed into a component due to men's labor mobility, and another counterfactual component in which women are also mobile. Both components have the same sign. The supply response of sector 1 with respect to an increase in *p* is greater when a larger subset of productive resources can be reallocated.[23] The mobility-constrained rise in total output, measured in terms of good 1, is less than the counterfactual (compare points *C* and *D* on the y_1 axis). Moreover, changes in factor returns will also differ between the two scenarios, in ways that are predicted by the Stolper-Samuelson theorem and its specific-factors analog (Dixit and Norman 1980).

In the immobile female labor case, a rise in the price of good 1 relative to that of good 2 produces the following comparative static predictions:

i. Returns to both male and female labor in sector 1 rise; in sector 2, returns to male labor rise and those to (sector-specific) female labor fall.
ii. Output in sector 1 increases and that in sector 2 declines, with the extent of change in each limited by the quantity of labor that can be reallocated.

[22] The trade-theoretic intuition is that a long-run adjustment is the sum of a short-run reallocation of mobile labor, and the longer-run reallocation of fixed factors such as capital through depreciation and reinvestment—together with additional labor reallocation consequent on such sectoral shifts in capital stocks. This decomposition is shown formally by Mayer (1974, eq. (16)).

[23] This an expression of the Le Chatelier-Samuelson principle (Samuelson 1983).

iii. Following from (ii), the economy-wide total value of output increases, to the extent that labor is mobile.
iv. Following from (i), the intersectoral wage gap for female labor widens (assuming that wages were initially higher in sector 1). The change in the economy-wide male-female wage ratio change is indeterminate, but the probability that it will rise is an increasing function of the fraction of women employed in sector 1.

The prediction on relative labor wage changes in point (i) is obtained directly from the zero profit conditions in equation (1) and the associated price change ordering in equation (2), due to Jones (1971).

Comparing the counterfactual with full female labor mobility, a rise in the relative price of good 1 produces the following results:

v. Average factor returns in sector 1 increase, and those in sector 2 decline.
vi. Output increases in sector 1 and decreases in sector 2, and the extent of change in each is greater than in the immobile labor case.
vii. Aggregate value of output increases, by more than in the immobile labor case, since female labor can now be allocated in a more economically efficient way.
viii. Any change in the economy-wide male-female wage ratio depends on relative sectoral intensity of employment by sex. If sector 1 is initially intensive in male labor, then the gender wage gap will likely rise, and vice versa.

The foregoing are the core insights from the specific-factors model. Some additional longer-run implications can also be extrapolated. First, investments in sector-specific capital (such as in sector 1, manufacturing industry) follow changes in incentives. So, when female labor mobility is constrained, a higher industry price results in a smaller rise in returns to manufacturing sector capital. This means correspondingly smaller incentives for domestic and foreign investment in the sector, and therefore fewer new employment opportunities created. In the long run there could be less industrialization and less aggregate economic growth. Second, for those women confined to the agricultural sector, in the absence of meaningful technical progress labor productivity remains low both absolutely and relative to that of men. With a growing population, agriculture becomes increasingly feminized and returns to female labor tend to fall so long as agricultural prices remain unchanged. Finally, as new opportunities for men arrive, such as in the form of employment in the Gulf states, the earnings gap only widens further.

We have highlighted the issues by considering two extreme labor mobility cases. All the predicted outcomes are of course moderated in the real-world case of partial female mobility. If mobility increases over time, the economy can move toward a path of greater industrialization and growth. This experience has been documented in Bangladesh, for example, where both the ready-made garment industry and female employment have both boomed (Robertson et al. 2020a). In the section we use insights from the two-sector model to form hypotheses about the impact of a positive trade shock to the Pakistan garment industry.

V. Empirical corroborations

The Pakistan experience with labor-intensive industrialization has many potential explanations, and a full accounting of these goes well beyond the scope of this paper, but it is certainly consistent with our conjecture that Pakistan's garment industry supply response would be weak given the difficulty in attracting female labor to factory work. In this section, we use Pakistan Labor Force Survey (LFS) data and ask what (if anything) changed for women in the Pakistan wage labor force from before to after GSP+.

Employment and earnings before and after GSP+

The literature reviewed earlier identifies three main margins at which adjustment to a trade shock may be observed: employment, wages, and formality. In this sub-section, we examine evidence of adjustment along these margins.

Employment

Trends in employment by industry during the first years of GSP+ show an acceleration in light manufacturing jobs overall, and in the garments, textiles, and leather (GTL) subsectors between 2013-14 and 2017-18 compared with the previous half-decade (Table 3). But growth of GTL jobs, at 5.9% per year, is hardly exceptional either by international standards or relative to other manufacturing industry groups within the Pakistan economy, and over the decade to 2017-18, the share of the national workforce employed in GTL rose only modestly, from 7.2% to 8.1%.

Table 3 about here

The Labor Force Survey of 2013-14 showed that Pakistan's garment and textile industry directly employed about 1.3m workers, accounting for 30% of the manufacturing labor force.

So other things equal, each percentage point increase in production for export should have expanded employment in this sector by about 13,000 workers. Without counting either positive linkage effects (e.g. in the manufacture and repair of equipment) or negative ones (crowding-out of other sectors), and assuming no change in hours worked by workers already employed in the industry, the employment share of garments and textiles should rise relative to the total manufacturing labor force. Job numbers did rise, by about 75,000 per year (an annual increase of almost 6%) to 2017-18, a rate of increase somewhat lower than the 7.6% annual increase in quantity exported. And the share of garments and textiles in manufacturing employment remained roughly constant over the decade spanning the GSP+ award (Table 4).

Table 4 about here

Formality

We know that women's work and men's work is qualitatively different, in GTL and in many other sectors. The LFS data show the garment, textile and leather industries adding 260,000 wage jobs and 294,000 piecework jobs in the four-year interval between 2013-14 and 2017-18. Of these, almost all the new wage jobs (95%) went to men, while four in five of new piecework jobs went to women. Table 4 shows the breakdown of employment growth rates.

Figure 7 provides insights into differences, over industries and years, for the female wage labor force. The number of women in wage employment doubled in the decade from 2007-08 to 2017-18, but GTL employment grew more slowly, by almost 70%. In non-GTL industries, only a minority of women are employed on a piecework basis. This proportion declined somewhat from 2007-08 (35% piecework) to 2017-18 (26%). In GTL industries, where the fraction of employees who are women is higher, the piecework rate was 86% in 2007-08, and 85% in 2017-18. The number of women employed as regular wage employees in GTL increased only from 29,000 to 38,000 over that decade. The expansion of GTL sector wage employment over the half-decade from 2012-13 was dominated by jobs taken by women, but the vast majority of the new female jobs created were as pieceworkers or casual employees. This trend is strikingly different from comparable export expansions elsewhere, which show declining informal employment especially for women: see McCaig and Pavcnik (2018) on Vietnam, and Artuc et al. (2019) on India and Bangladesh.

Earnings

The Stolper-Samuelson theorem predicts that a rise in the price of a labor-intensive good will raise the real return to labor. In their analyses of trade shocks and female employment in

Bangladesh, Robertson et al. (2020a) use Mincer regressions to evaluate industry-specific effects on women's earnings. They are especially interested in the labor market effect of a strongly positive trade shock, the abolition of the Multifiber Arrangement (MFA). As expected, they confirm a significant discount of women's earnings relative to those of men in each year. Their data also show that for women, employment in the textile and apparel sectors carries a significant positive wage premium. Comparing estimates over years, they find that in Bangladesh the gender wage gap was significantly reduced after the MFA ended. Lastly, using information on the location of industries, they find significant short-run increases in women's wages and earnings after the shock. This gap is dissipated in the longer run through labor migration.

We can replicate the key features of this empirical model using data from Pakistan LFS. We use four rounds of the survey, from 2007-08 to 2017-18. The questions of interest are (1) whether earnings for women in GTL industries are higher than in other industries, and (2) whether women's earnings in GTL increased from before to after the GSP+ award. The outcome variable of interest is ln (y_i), the log of monthly earnings reported by employed individual *i.* The LFS does not report earnings data for unpaid family workers, employers, or the self-employed, so our analysis is restricted to wage-earners and pieceworkers. For each survey year the basic estimating model is:

$$\ln(y_i) = \beta_0 + \beta_1 F_i + \beta_2 GTL_i + \beta_3 F_i * GTL_i + \beta_4 Age_i + \beta_5 Age_i^2 + \beta_6 Educ_i + \epsilon_i.$$

The right-hand side variables are the sex of the individual (*F*=1 for women, 0 for men); an indicator for GTL employment; an interaction of sex with GTL employment; age; age squared, and educational attainment (fixed effects for province and one-digit industry are also included).[24] Among the coefficients of prime interest, $\beta_1$measures the unconditional wage gap and β_2 the average wage differential for GTL employment. Any differential wage gap for GTL employment by women is captured by β_3*GTL; a positive (negative) sign on β_3 indicates that the overall female wage discount is smaller (larger) for women in this

[24] The empirical papers reviewed earlier in this section derive identification from so-called Bartik instruments in which spatial employment or industry shares are interacted with national growth rates. They examine the effects of external trade shocks that are heterogenous by product (industry) and location. We have not as yet been able to locate a spatial dataset for Pakistan's industrial enterprises that would permit us to use this approach. Artuc et al. (2019) apply such methods to data for India, Sri Lanka and Bangladesh but note that "Pakistan lacks the sufficient data required to support our methodology" (p. 97). The World Bank Enterprise Survey (latest round: 2013) has a total sample size of just 1,247 firms, of which 86 are listed as in the garments sector. Of these, 67 (78%) are located in Punjab province, almost all in just two cities, Lahore and Sialkot.

industry relative to other wage-earning women. This coefficient provides a *ceteris paribus* approximation of the effects of expanded GTL activity on women's earning power.

Data

The data are all drawn from LFS.[25] The survey sample design is described in official LFS reports (PBS 2013a, PBS 2018). The survey begins with all respondents aged 5 and over in each sampled household, then puts a set of labor market participation and earnings questions to respondents aged 10 and over. A large fraction of respondents is either unemployed or not in the labor force. In addition, there are substantial gaps in the data. Most notably, monthly earnings data are missing for around 40% of employed men who work as wage-earners, and 50-60% of women, depending on the survey year.[26] In each survey round, the sample ultimately available for estimation purposes is roughly 10% of the number of all respondents aged 10 and over, as seen in Table 5. This in-sample attrition is highly uneven between men and women and raises a concern about selection bias. Women are far less likely than men to be in the labor force, and those women who are counted as employed are much less likely than men to be wage-earners. Lastly, the 2012-13 and 2013-14 LFS, despite being in adjacent years, occasionally display unexpectedly large differences in some variables.[27] We report estimates using 2013-14, though full tables are available on request.

Table 5 about here

Another issue that merits attention is that of endogenous selection into GTL employment (or any other industry). If workers of higher ability are sorting into higher-paying industries then estimates of returns in lower-paying industries are subject to downward bias since they reflect both productivity and selection effects. Our estimates control for such selection in part, by conditioning on education and age. We have in addition noted elsewhere that women in

[25] An ideal data set to explore these issues would require not only some exogenous shock but also detailed information on women's labor force status and mobility, to provide a well-identified source of variation in incentives and behavior. Such data are scarce in all developing countries, and virtually non-existent in Pakistan. The LFS is the closest approximation to the preferred data set. The Pakistan Living Standards Measurement Survey, a nationally representative household survey, contains richer data on individuals and households but is both sparse in labor market data and also much smaller in sample size than the LFS.

[26] For many of sample observations for which monthly earnings are not available, weakly earnings are often reported. Regressions results using these data or monthly earnings data appended with these data are qualitatively similar to the results reported in this paper.

[27] 2012-13 was an unusually bad year for industry. The country's power sector experienced a catastrophic decline in productivity; with the electricity generation and & distribution sector contracting by over 16%. In 2013-14 the sector resumed a more usual growth rate of 3.7%. Energy shortages were identified as a leading cause for decline in industrial output in general and textile and garment exports in particular (Pakistan Economic Survey 2013-14, Manufacturing and Mining chapter, p.47, http://www.finance.gov.pk/survey_1314.html)

Pakistan typically do not migrate for employment, so there is little cause for concern that the industrial labor force attracts women from their other primary occupation, agriculture, through selection.

Estimation: earnings

We estimate the Mincer model described above using OLS. Results using reported monthly wages are shown in the first three columns of Table 6, and those using weekly wages in the first three columns of Table 7.[28] The influence of age and education on earnings have expected signs and significance and vary little over LFS rounds. The gender wage gap (i.e., the female wage discount) in monthly earnings shows no discernible trend: it was 44% in 2007-08, 54% in 2013-14, and 53% in 2017-18. Likewise, the wage gap in weekly earning shows no clear trend: it was 71% in 2007-08, and 61% in 2017-18.

Table 6 about here

Table 7 about here

Relative to wage employment in agriculture, the premium in monthly earnings for light manufacturing, which includes GTL, was 35% in 2012-13 and 38% in 2017-18. In weekly data, the wage premium in this industry was smaller, between 13% and 24% depending on the round.

Our estimates can be compared with findings in respect to the female earnings premium for GTL employment reported for Bangladesh in Robertson et al. 2020a and for Sri Lanka and Cambodia in Robertson et al. 2020b. The former study, for example, finds a premium of 15 percentage points (p.p.) on the interaction of female*GTL, indicating a positive wage premium for women in the ready-made garment sector over their earnings in the baseline sector, agriculture.[29] The overall value (in percentage points) of this premium is the sum of the premium in light manufacturing plus the additional premium for GTL within that sector, minus the discount for women's earnings in that sector. From Table 6, using monthly earnings, the premium ranges from -0.205 (i.e., -21%) in 2007-08 to 0.14 in 2017-18. Using weekly earnings (Table 7), the Pakistan data show a discount for female GTL employment relative to agriculture in every year, and a greater discount in 2017-18 than in 2007-08. In

[28] Because the number of women in the formal labor force is small, so too are the numbers of observations of women in the earnings regressions. Over all four LFS waves used here, there are 7,721 women earning monthly wages and 6,856 earning weekly wages.

[29] Their estimates, for comparison, are: age 0.038; skill 0.70; female -0.59; textile & apparel 0.056; female*textile & apparel interaction 0.163, all with $p<0.01$, adj. R^2 0.37.

both tables we see that the premium for light manufacturing remains more or less stable.[30] Comparing these estimates, the only really safe conclusion is that from before to after the GSP+ award, there is no clear trend in the female wage premium for working in GTL relative to agriculture. Relative to the Bangladesh estimates, it may be reasonable to conclude that the most positive female wage premium found in our data—a 14% margin in monthly earnings, in 2017-18—is about the same as the female premium for the same industry in Bangladesh in 2005, *prior to* that country's largest positive export demand shock.

Wage work versus piecework

The next step in our analysis takes account of the different employment modes. For this, we augment the basic estimation model shown above by addition of a term identifying employment type (piecework=1; 0 otherwise) and interactions between this and the indicators for females and GTL. The goal is to identify sources of changes in female earnings within and outside the GTL industry, taking account of the fact that the biggest increase in female GTL employment was in piecework (Figure 7).

Estimates in the rightmost columns of Tables 6 and 7 allow for separate returns to piecework and wage employment by sex, and in GTL and non-GTL industries. The basic Mincer estimates (age, education, sex) as well as the light manufacturing and GTL premia estimates are all essentially unchanged from those in the first three columns. But returns to piecework in general, and in particular those to piecework performed by women, are strongly negative—and in the weekly wage results of Table 7, the return to women's piecework in GTL carries an additional, deeper discount. Summing up, it appears that relative to agricultural work, the premium for women in the light manufacturing and GTL industries is large if (and only if) they are employed on a regular basis with a monthly salary. If they are employed on a weekly basis, and most especially if they are engaged as pieceworkers, there is no earnings premium and in fact, there may be a substantial discount. Moreover, there is no evidence of any difference in women's wage premia in the years that precede and follow the GSP+ award.

Discussion

We have estimated returns to employment in GTL for women in Pakistan, in the year prior to the EU award of GSP+ status to Pakistan's exporters and again three years after the award. Our estimates indicate that in contrast to Bangladesh, women moving into the textile and

[30] This calculation ignores selection into GTL employment. We do not at present have well-defined priors about the direction of bias that failure to account for selection might induce.

apparel sector in Pakistan cannot expect much gain. Digging deeper, two reasons seems to emerge. First, women are paid a lot less than men in general, regardless of other factors. Second, women in Pakistan's textile and apparel industry are overwhelmingly employed in piecework rather than as wage workers. Piecework in general is less well paid, and women in particular experience very low returns when they engage in GTL sector production under piecework arrangements. The LFS data do not indicate that conditions of women's employment in GTL have improved in the years following GSP+.

The different modes of employment (wage work vs. piecework) are relevant to the issue of limits to female labor mobility. They likely reflect women's unwillingness or inability to travel to a factory for employment. Instead, many women take in garment production to their homes, where they can work without risk of endangerment or stigma, but where their productivity is lower than on a factory floor. Productivity differences between the two modes of employment might in turn be related to many other factors, such as unreliable electric power supply; or it could be that piecework produces a differentiated (and lower-quality) range of products. Endogenous selection of less capable women into piecework is also likely. These are details that should be explored in future research.

The labor market findings are consistent with persistent social norms that limit female labor mobility. In addition, the small wage premium for formal work suggests that in contrast to a country like Bangladesh, women in Pakistan can expect little financial advantage by joining the textile and apparel sector. A larger sectoral wage gap incentivizing women to join the wage labor force might hasten the weakening of constricting social norms. But in the presence of restrictive norms on behavior it is likely that changes in labor market participation require a minimum threshold of "defectors" from existing norms such that the reputational cost of making a change is smaller than the economic gain (cf. Akerlof 1980). With continuing slow growth and low rewards to female wage labor, this threshold may be still beyond reach in Pakistan.

We acknowledge that this analysis simply examines "before" and "after" cases, and as such has no direct causal implication. Moreover, the low numbers of women working in GTL, or indeed in any formal employment, severely limit analytical power. So too does lack of information on earnings for *all* women in the labor force, including the self-employed and those engaged in family enterprises. Interestingly, however, the estimates are quite consistent with predictions from the analytical model in the previous section incorporating restrictions on female labor mobility.

VI. Conclusions and future research directions

Female labor force participation and mobility are characteristic features of early manufacturing export growth in low-income developing countries. These features are not shared in Pakistan, where extrinsic and intrinsic constraints limit women's non-agricultural wage employment. Theory shows that this reduces potential for specialization in labor-intensive manufacturing, which in turn lowers all labor productivity, widens the male-female earnings differential, and prevents the economy from moving onto a higher GDP growth path. Our investigations with labor force data corroborate these predictions for a positive export shock. They also suggest that even for women engaged in the wage labor force, preferences or pressures for home-based work rather than physical presence on the factory floor consigns them to a lower-productivity, lower-wage mode of employment. Whatever the drivers of selection into piecework may be, this is likely to be a fruitful area for research aimed at understanding the gender wage gap. Such work will be complementary with research on the larger question of persistent limits on women's wage labor participation and occupational mobility in response to changes in economic opportunity.

Limitations on women's labor force participation and workforce mobility are likely to account for some important aspects of Pakistan's development performance, and in particular for the underperformance of labor-intensive manufacturing industry following domestic and foreign policy reforms. The scale of the effect is undeniable: a majority of Pakistan's female labor force is either underutilized or misallocated relative to a counterfactual of full labor mobility. Any institution having such pervasive effects on resource allocation and incomes can naturally be expected to spill over into many areas of economic and social life.[31] We conclude that in discussion of Pakistan's developmental failures, it is time for a fuller recognition and policy-oriented consideration of the macroeconomic effects of restrictions on female mobility.

[31] The continuing prevalence of the dowry system in Pakistan, involving payment made at marriage by the bride's family to that of the groom (Anderson, 2007; Shah et al., 2016; Makino 2019) is arguably complementary to purdah (Cheema and Coxhead, 2022). There may be a link also between restrictions on female mobility and the widespread use of child labor in Pakistan as, when many occupations are partly or fully closed to women, and when legal and institutional prohibitions are weak, children supply part of the additional labor demanded. While poverty undoubtedly drives many families to countenance child labor, it is apparent that demand-side factors are important (Fatima 2017).

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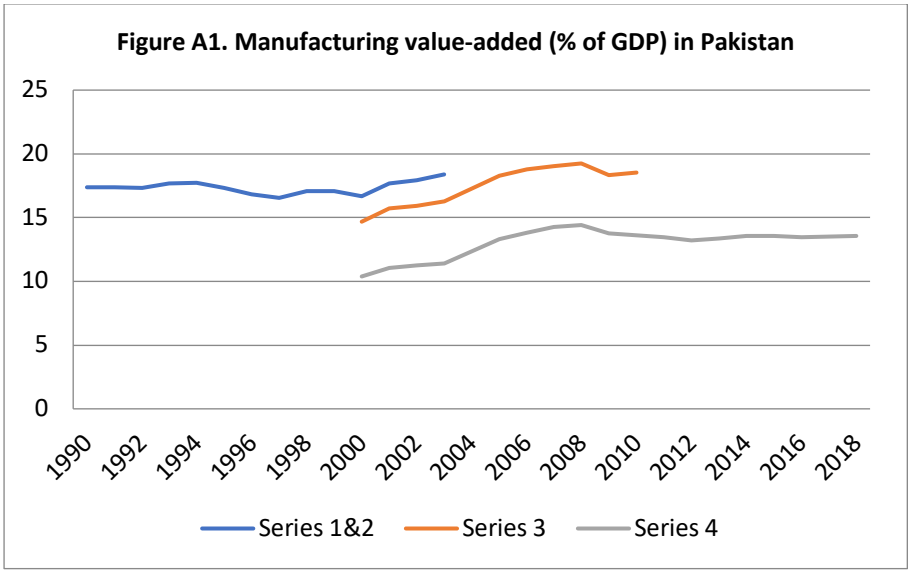
Appendix: Manufacturing share in Pakistan's GDP

Due to changes in definitions used in the national accounts, it is not straightforward to calculate the share of manufacturing in Pakistan's GDP. A simple plot using World Development Indicators (WDI) data without adjusting for these changes would show "de-industrialization" with the share highest in 2005, followed by a sharp decrease, and with several abnormal-looking discontinuities. These are due to data problems. WDI figures are taken from GDP series compiled by the Pakistan Bureau of Statistics (PBS), a wing of the Government of Pakistan, without sufficient notes on different definitions. We attempt here to compile a series covering the period 1990s-2010s with consistent definitions. However, the definitional changes include substantial ones such as whether cotton ginning industry is classified as an agricultural or manufacturing activity, whether value-added from financial operations conducted by manufacturing firms is attributed to the manufacturing or banking/finance sector, etc., for which no detailed information is available from PBS to re-estimate the series under a uniform definition. Our best estimates are shown in Figure A1, with three different series of manufacturing share in Pakistan's GDP. It should be noted that none of these figures show the abnormal-looking discontinuities that characterize the WDI data.

The combination of the three smooth figures shows that Pakistan witnessed a gradual decline in manufacturing share in GDP from 1990 to 2000, recovery from 2000 until 2008, and thereafter remained slightly below the 2008 level. Using the series based on the latest definition as the basis and splicing backward, the GDP share of manufacturing averaged 10.7% in the 1990s and 13.5% in 2010-18. Therefore, the de-industrialization story is not supported. However, the stagnation of the share in the mid-2000s and the 2010s is remarkable, and stands in sharp contrast to other low-income developing countries that had been successful in garment exports.



Notes: GDP series for real value-added in factor cost is used to calculate the share. The denominator is total GDP and the numerator is value-added from the manufacturing sector. Pakistan's fiscal year is from July 1 to June 30 next year (in the figure, fiscal year 1989-90 is denoted as "1990"). Series 1&2, Series 3, and Series 4 are based on different definitions of manufacturing value-added, with the narrowest definition adopted for Series 4.
Data sources include Economic Advisor's Wing, Ministry of Finance, Government of Pakistan, *Pakistan Economic Survey*, various issues; PBS (2013), *National Accounts of Pakistan: Change of base from 1999-2000 to 2005-2006*; PBS (2017), *National Accounts of Pakistan: Backward revisions for the years 1999-2000 to 2004-05 on base year 2005-06*, and information available on the PBS web at http://www.pbs.gov.pk/ (last accessed July 2020).

Figures and Tables

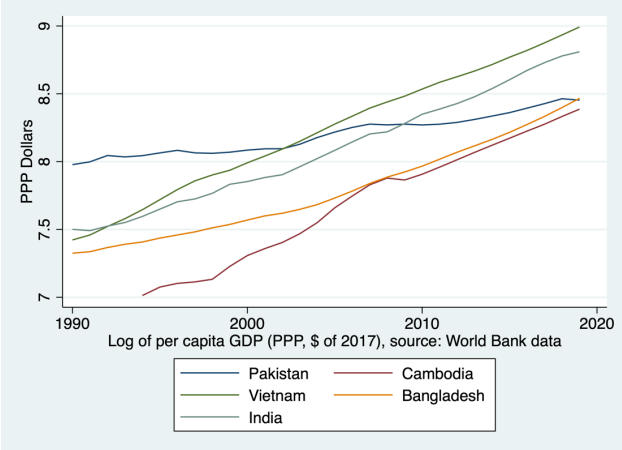


Figure 1: Per capita income trends (Source: World Bank data)

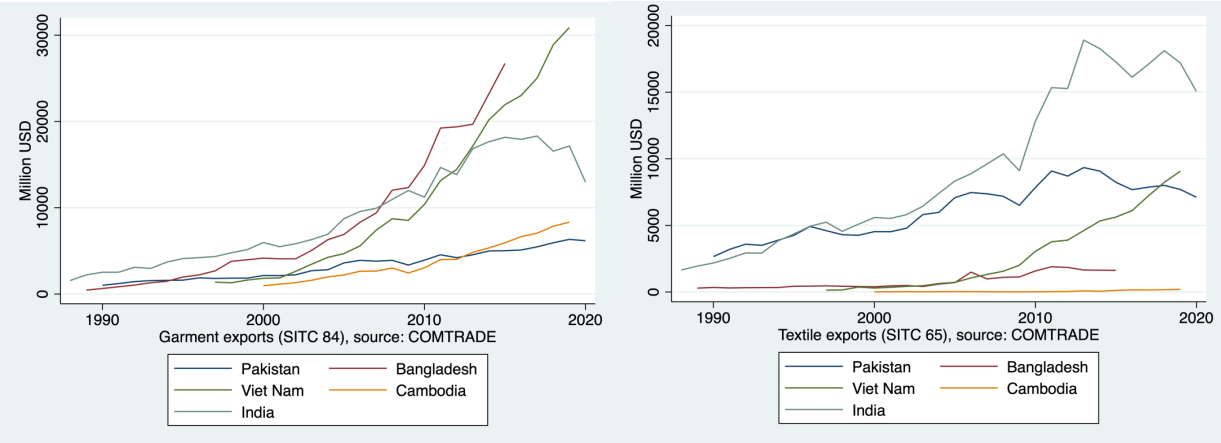


Figure 2: Garment and textile exports from Pakistan and selected countries to the world

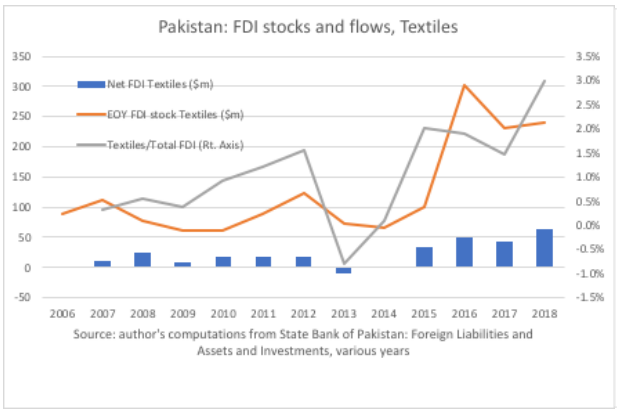


Figure 3: Foreign investment in textiles

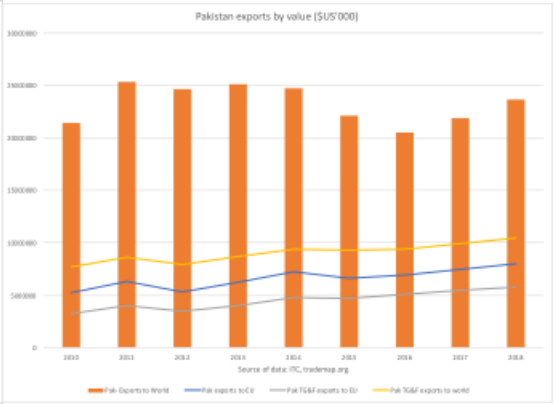
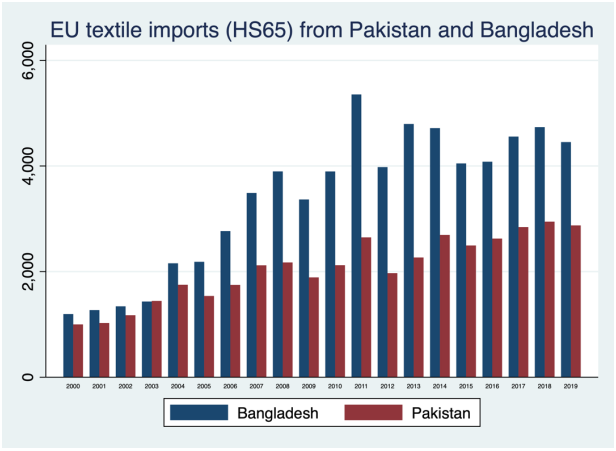


Figure 4: Pakistan's export trends



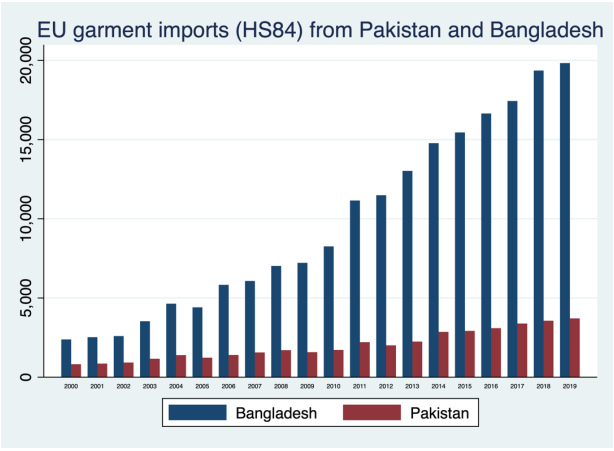


Figure 5: EU textile and garment imports from Pakistan and Bangladesh, 2000-2019 ($USm). Source: Comtrade.

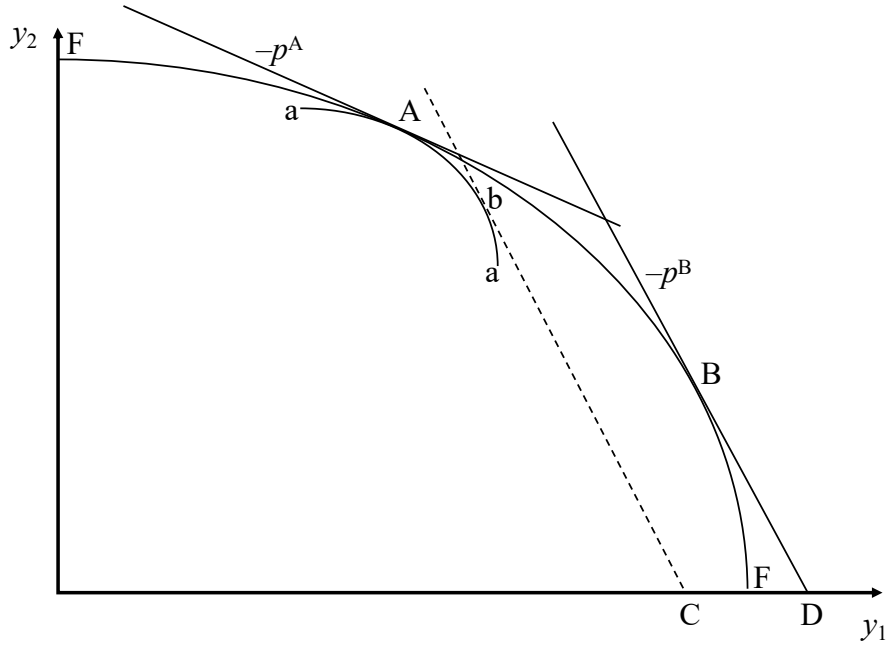


Figure 6: Output responses to price change with partial and full labor mobility

(Source: adapted from Mayer 1974)

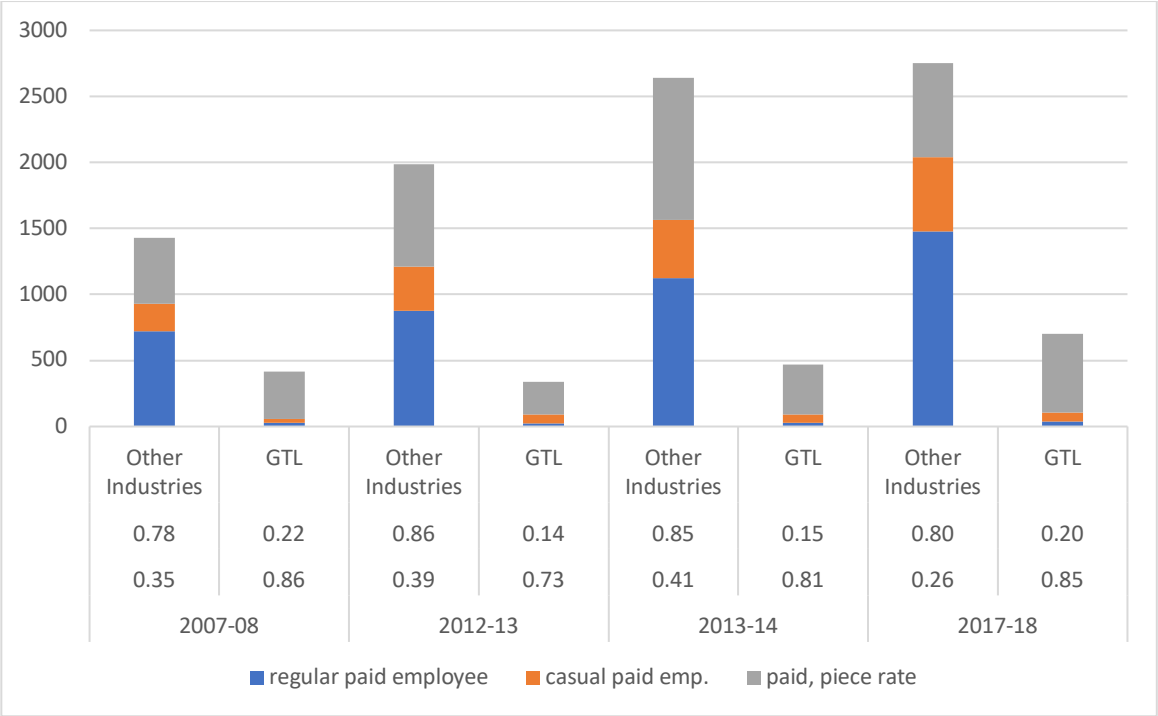


Figure 7: Women's wage employment by industry and contract type and industry, 2007-08 to 2017-18 (thousands)

Note: GTL: garment, textile, and leather industries. The first numbers below each category show the sectoral distribution of female wage employment (per cent). The second numbers show women's piecework employment as share of total female wage employment total in each sector.

Source: Author's calculations from Pakistan Labor Force Survey.

Table 1: Individual responses to questions about decision-making

	PSLM2005-06			PSLM2011-12			PSLM2018-19		
	Total, N	Wage/salary employed in non-agriculture		Total, N	Wage/salary employed in non-agriculture		Total, N	Wage/salary employed in non-agriculture	
		N	%		N	%		N	%
All females aged 15-49	25,651	2,054	8.01	25,479	2,355	9.24	38,381	3,760	9.80
By education decision making									
Traditional = 1	11,371	573	5.04	11,302	755	6.68	15,535	1,021	6.57
	(46.22)			(45.97)			(42.20)		
Empowered = 1	2,564	362	14.12	3,172	448	14.12	3,220	607	18.85
	(10.42)			(12.90)			(8.75)		
Traditional and empowered = 0	10,669	987	9.25	10,111	1,049	10.37	18,061	1,920	10.63
	(43.36)			(41.13)			(49.06)		
Subtotal (females aged 15-49, to which the decision making question was applied)	24,604	1,922	7.81	24,585	2,252	9.16	36,816	3,548	9.64
	(100.00)			(100.00)			(100.00)		

Note: "Traditional" = 1 if the response to "who makes educational decisions for [respondent] is "father or husband alone." "Empowered" =1 if the response is "The woman alone." Figures in parentheses show distribution (%) to the sub-total.

Source: Calculated by the authors using microdata of PSLM.

Table 2. Correlates of female non-agricultural employment (OLS regression results)

	(1) 2005-06		(2) 2011-12		(3) 2018-19	
Household-level empowerment						
Traditional = 1 for all women in HH: b_1	-0.0193	***	-0.0272	***	-0.0218	***
	(-3.93)		(-5.18)		(-4.87)	
Empowered = 1 for any woman in HH: b_2	0.0238	***	0.0173	**	0.0488	***
	(3.20)		(2.25)		(6.27)	
Respondent education (ref.=primary)						
Secondary	0.0058		-0.0373	***	-0.0396	***
	(0.91)		(-6.59)		(-8.19)	
Tertiary	0.1934	***	0.1694	***	0.1665	***
	(10.64)		(11.80)		(14.25)	
Respondent age (ref.=28 yrs old)						
Age-28	0.0016	***	0.0019	***	0.0016	***
	(6.92)		(8.78)		(8.64)	
(Age-28)^2/100	-0.0095	***	-0.0055	**	-0.0035	*
	(-4.62)		(-2.52)		(-1.85)	
Province and rural-urban FE	Y		Y		Y	
N	25,266		25,127		37,785	
F-stat for zero slopes	58.56	***	69.42	***	112.81	***
R2	0.0432		0.0532		0.0551	
F-stat for the null Ho of coefficient equality across years						
b_1 is equal for 2018-19 and 2011-12					0.62	
b_1 is equal for 2018-19 and 2005-06					0.14	
b_1 is equal for all three rounds					0.61	
b_1 and b_2 are equal for 2018-19 & 2011-12					4.16	**
b_1 and b_2 are equal for 2018-19 & 2005-06					3.15	**
b_1 and b_2 are equal for all three rounds					2.55	**

Notes: *t*-statistics in parenthesis (based on cluster-robust standard errors using PSU as the cluster), significant at 1% ***, 5% **, and 10% *.

The number of observations used in the regression is between two figures of the sum reported in Table 1. This is because the women empowerment dummies are now aggregated at household level. When some women in the household responded to the question, the household-level dummies were defined and when no women responded, the household-level dummies became missing.

Table 3: Employment by industry, Pakistan

	Employment shares			Annual average growth %	
Industry	2007	2017	Change	2007-2013	2013-2017
Agric./forestry/fisheries	0.429	0.366	-0.06	3.47	-0.55
Mining	0.001	0.002	0.00	24.54	6.73
Light manufacturing	0.100	0.107	0.01	2.90	6.27
(of which, GTL)	(0.072)	(0.081)	(0.01)	(3.87)	(5.89)
Refining/basic products	0.012	0.025	0.01	16.35	5.06
Metal/elect/mach mfg	0.013	0.035	0.02	19.89	5.57
Utilities	0.008	0.008	0.00	5.93	-0.27
Construction	0.068	0.079	0.01	6.97	2.19
Wholesale/retail/transp	0.210	0.230	0.02	4.96	3.54
Professional services	0.015	0.027	0.01	11.40	6.62
Pub. admin/educ/health	0.145	0.122	-0.02	0.26	3.83
Total	1.00	1.00		4.26	2.27

Source: Authors' calculations from Pakistan LFS 2007-08, 2013-14, 2017-18. GTL: Garments, textiles, and leather

Table 4: Employment growth in garments, textiles, and leather

		Employment shares		Average annual growth %		
		2007	2017	2007-2013	2013-2017	2007-2017
GTL	Male	6.2	6.2	2.14	4.28	2.99
	Female	10.4	14.4	7.64	8.62	8.03
	Total	7.0	8.0	**3.87**	**5.89**	**4.67**
Wage workers	Male	50.3	54.3	2.88	5.17	3.79
	Female	7.6	6.0	6.93	3.34	5.48
	Total	38.0	35.2	**3.13**	**5.04**	**3.89**
Pieceworkers	Male	21.1	19.8	1.44	3.68	2.33
	Female	45.7	36.0	0.85	12.79	5.46
	Total	28.2	26.2	**1.17**	**8.14**	**3.90**
Self-employed	Male	28.7	25.9	1.32	2.95	1.97
	Female	46.7	58.1	12.78	6.95	10.41
	Total	33.8	38.6	**6.62**	**5.23**	**6.06**

Notes: Employed workers, age range 10-60. Source: Authors' calculations from Labor Force Survey (Computations in Pak LFS growth calculations.xlsx from LFSCombined.do).

Comment: Post-2013, growth in total employment was almost 6% per year, three p.p. higher than in 2007-13. But whereas for men the growth was fastest in wage employment, for women it was fastest in piecework and self-employment (the dominant category in the SE & OAW group). In fact, the share of women in this industry employed as wage workers actually declined, from 7.6% in 2007-08 to 6% in 2017-18.

Table 5: Sample size and in-sample attrition (units: thousand)

	2007-08			2012-13			2017-18		
	Total	M	F	Total	M	F	Total	M	F
All aged ≥ 5	250.8	129.5	121.3	228.2	118.1	110.1	272.9	139.6	133.4
Gender distribution		52%	48%		52%	48%		51%	49%
All aged ≥ 10	177.1	91.6	85.5	163.5	84.6	78.9	191.2	97.1	94.2
		52%	48%		52%	48%		51%	49%
Employed*	39.3	31.7	7.6	61.3	51.9	9.4	76.3	60.7	15.6
		81%	19%					80%	20%
Unemployed	7.2	2.6	4.6	13.3	5.5	7.8	9.6	4.6	5.0
NILF: In eductn	32.5	19.4	13.1	34.5	20.3	14.2	40.3	23.6	16.7
NILF: > 60 yo	5.6	2.5	3.1	6.0	2.8	3.2	7.6	3.3	4.3
NILF: Other				48.4	4.0	44.3	65.0	7.8	57.2
Wage-earner		23.7	2.8	26.2	23.2	2.9	31.8	27.5	4.3
					89%	11%		86%	14%
Employer/self-emp		23.6	1.6	22.8	21.2	1.6	28.8	25.8	3.1
Unpaid fam. wkr		10.9	7.3	12.3	7.5	4.8	16.3	8.0	8.2
Monthly inc. data=Y		14.9	1.7	16.0	14.2	1.8	17.9	15.7	2.2
					89%	11%		88%	12%

* Employment status is employed/unemployed/not in labor force (NILF).

** Excludes employers, self-employed (several categories) and unpaid family workers

Source: Authors' calculations from LFS.

Table 6: Correlates of monthly earnings, by LFS round

	Basic Mincer model			Including piecework controls		
	2007-08	2013-14	2017-18	2007-08	2013-14	2017-18
Age	0.031***	0.030***	0.027***	0.031***	0.030***	0.027***
	(45.39)	(45.94)	(41.71)	(45.28)	(46.17)	(41.88)
Age squared	-0.072***	-0.064***	-0.058***	-0.072***	-0.064***	-0.058***
	(-24.56)	(-22.61)	(-21.61)	(-24.47)	(-22.68)	(-21.67)
Secondary ed.	0.261***	0.283***	0.266***	0.254***	0.278***	0.262***
	(22.99)	(26.08)	(24.75)	(22.46)	(25.77)	(24.41)
Tertiary ed.	0.781***	0.848***	0.737***	0.774***	0.841***	0.732***
	(54.42)	(63.05)	(59.67)	(54.00)	(62.75)	(59.31)
Female	-0.438***	-0.540***	-0.529***	-0.428***	-0.521***	-0.523***
	(-25.06)	(-35.14)	(-35.44)	(-24.33)	(-33.68)	(-34.98)
Light manufacturing	0.353***	0.319***	0.375***	0.345***	0.305***	0.372***
	(10.77)	(10.31)	(13.09)	(10.57)	(9.88)	(13.05)
GTL	0.026	0.068**	0.042	0.031	0.067**	0.051*
	(0.92)	(2.40)	(1.58)	(1.07)	(2.32)	(1.91)
Female*GTL	-0.584***	-0.006	-0.277***	-0.158*	0.290***	0.065
	(-10.63)	(-0.09)	(-4.22)	(-1.75)	(3.72)	(0.77)
Piecework				-0.156***	-0.196***	-0.206***
				(-4.46)	(-4.93)	(-5.29)
Female*Piecework				-0.501***	-0.654***	-0.364***
				(-4.25)	(-6.75)	(-2.80)
GTL*piecework				0.025	0.169**	0.038
				(0.38)	(2.21)	(0.50)
Female*GTL*piecework				-0.036	-0.281	-0.321*
				(-0.21)	(-1.61)	(-1.68)
Constant	7.961***	8.765***	9.163***	7.977***	8.784***	9.168***
	(296.28)	(358.39)	(402.11)	(296.26)	(359.87)	(403.19)
N	15972	17788	17744	15972	17788	17744
F	560.443	715.809	570.621	469.974	604.237	478.427
r2	0.400	0.434	0.380	0.404	0.439	0.383

t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Demeaned age = true age – 28. Base categories: less than secondary education, wage employment, agric/forestry/fishery industry. Province controls and other industry dummies (Mining, Basic mfg., Metal/mach mfg., Utilities, Construction, Other services, Prof'l services, Public services) not reported.

Table 7: Correlates of weekly earnings, by LFS round

	Basic Mincer model			Including piecework controls		
	2007-08	2013-14	2017-18	2007-08	2013-14	2017-18
Age	0.017***	0.014***	0.019***	0.017***	0.014***	0.018***
	(21.13)	(25.20)	(31.51)	(21.00)	(24.88)	(30.61)
Age squared	-0.054***	-0.042***	-0.056***	-0.054***	-0.042***	-0.054***
	(-14.48)	(-15.60)	(-20.06)	(-14.49)	(-15.48)	(-19.56)
Secondary ed.	0.170***	0.093***	0.120***	0.168***	0.095***	0.117***
	(9.29)	(7.47)	(7.09)	(9.20)	(7.64)	(6.95)
Tertiary ed.	0.860***	0.268***	0.235***	0.855***	0.271***	0.234***
	(10.77)	(3.92)	(3.62)	(10.72)	(3.96)	(3.63)
Female	-0.705***	-0.628***	-0.610***	-0.608***	-0.491***	-0.508***
	(-21.44)	(-33.18)	(-29.06)	(-11.97)	(-15.26)	(-17.73)
Light manufacturing	0.149***	0.167***	0.242***	0.143***	0.162***	0.234***
	(3.55)	(4.72)	(7.05)	(3.39)	(4.60)	(6.87)
GTL	-0.010	-0.019	-0.105***	-0.037	-0.192***	-0.272***
	(-0.22)	(-0.48)	(-2.82)	(-0.65)	(-3.68)	(-5.84)
Female*GTL	-0.268***	-0.357***	-0.676***	0.282*	-0.147	-0.406***
	(-4.97)	(-9.56)	(-18.58)	(1.94)	(-1.59)	(-4.93)
Piecework				0.027	0.066***	0.137***
				(1.46)	(4.63)	(8.75)
Female*Piecework				-0.159***	-0.209***	-0.245***
				(-2.62)	(-5.76)	(-6.68)
GTL*piecework				0.033	0.204***	0.180***
				(0.57)	(4.12)	(3.97)
Female*GTL*piecework				-0.556***	-0.224**	-0.248***
				(-3.56)	(-2.22)	(-2.70)
Constant	6.792***	7.678***	8.036***	6.791***	7.666***	8.015***
	(232.54)	(369.67)	(412.43)	(230.81)	(363.61)	(409.35)
N	9470	13003	13387	9470	13003	13387
F	139.432	299.529	380.729	116.957	252.098	324.292
r2	0.219	0.305	0.351	0.222	0.309	0.358

t statistics in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Demeaned age = true age – 28. Base categories: less than secondary education, wage employment, agric/forestry/fishery industry. Province controls and other industry dummies (Mining, Basic mfg., Metal/mach mfg., Utilities, Construction, Other services, Prof'l services, Public services) not reported.