Trade-induced Structural Transformation and Household-level Inequality: Lessons from Vietnam

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Abstract

Much is understood about how trade affects gender inequality in terms of labour force participation and wages at the firm and sector level. However, how trade affects gender inequality at the household level is an under explored area of research. This paper leverages the US-Vietnam Bilateral Trade Agreement (BTA) that came into force in 2001 as a natural experiment to explore how the disproportionate expansion of the female-intensive wearing apparel sector can trigger the structural transformation of the female labour force, and how this affects women's relative income and their intrahousehold bargaining power. Using a difference-in-differences strategy and through relying on panel data, I find that women residing in provinces that were more exposed to the BTA were more likely to work in the wearing apparel sector. I also find that such women increased their income relative to their husbands in the 4 years following the implementation of the trade agreement. I then examine whether the closing of the spousal household contribution gap led to changes in the allocation of household resources that could be indicative of higher female intrahousehold bargaining power. I find that although women in provinces more exposed to the BTA increased their wages relative to their husbands, household consumption of 'female-preferred' goods did not increase.

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1 Introduction

Trade can promote gender equality by disproportionately expanding sectors which are female-intensive. Under these circumstances, access to foreign export markets can create the economic conditions for women, rather than men, to reallocate into high-productivity firms and sectors which tend to pay higher wages. Even where there has been no reallocation of labour, it has also been shown that trade can increase the wages of women within exporting firms and sectors (Aguayo-Tellez et al., 2013; Juhn et al., 2014). However, whether trade alleviates or exacerbates gender inequality at the household-level in developing countries is not well understood.

Given that many developing countries integrate into the global supply chain by exporting goods in sectors that are predominantly female-intensive, it is important to examine the effects of trade at the household-level since there is an abundance of evidence that women's intrahousehold bargaining position is strengthened when the relative wages and labour market opportunities of women improve (Lundberg and Pollak, 1994; Aizer, 2010; Molina and Tanaka, 2023). Specifically, studies in this field emphasise that women's relative income and labour market opportunities strengthen her outside options, and act as important transmission mechanisms for household-level female empowerment since they allow women to credibly raise the threat of divorce when negotiations between spouses break down. Another reason why it is important to study the effect of trade on women within the household is that strong female intra-household bargaining has been linked to intergenerational benefits (Duflo and Udry, 2004; Majlesi, 2016; Almås et al., 2018; Armand et al., 2020).

This paper leverages the US-Vietnam Bilateral Trade Agreement (BTA) which came into effect in 2001 to study how the trade-induced disproportionate expansion of female-intensive sectors can lead to the structural transformation of the female labour force, and its effect on women's income relative to their husbands. This paper also explores whether the trade-induced structural transformation of the female labour force

bolstered their outside option such that their intrahousehold bargaining position increased. Additionally, this paper improves the estimation of the effects of access to foreign export markets on the outcomes of workers in developing economies through the use of panel data.

A key advantage of leveraging the BTA to study the effect of trade on household-level gender inequality is that the trade agreement resulted in a large and exogenous decline in costs for Vietnamese exporters, especially those in female-intensive sectors. This entailed a rapid increase in goods exported by Vietnamese manufacturers in female-intensive sectors to the United States. Specifically, the wearing apparel sector grew the most in terms of value of Vietnam's export to the US in the five years following the implementation of BTA, and was also the sector with the highest commodity export value in 2006 (McCaig and Pavcnik, 2015). This is not surprising given the fact that the wearing apparel sector saw the largest tariff cut under the BTA. Since over 70 percent of those working in the wearing apparel sector were women at the onset of the BTA, the subsequent integration of the Vietnamese wearing apparel sector into the global supply chain is expected to have structurally transformed the female labour force. Additionally, the BTA-induced structural transformation of the female labour force is expected to have boosted the intrahousehold bargaining position of women by improving their relative wages and labour market opportunities. Thus, under a framework where (i) men and women are imperfect substitutes in the labour production, (ii) each sector utilises male and female labour at different intensities, and (iii) trade disproportionately expands female-intensive sectors relative to male-intensive sectors, the BTA is expected to have structurally transformed the female labour force while concomitantly improving women's intrahousehold bargaining position (Juhn et al., 2014; Majlesi, 2016).

On the other hand, it is also conceivable that despite the improvement in women's outside options, women may be prevented from being empowered at the household level since these effects are mediated by social norms surrounding female employment, male

identity and divorce (Kotsadam and Villanger, 2022). For example, if husbands feel as though their traditional roles have been undermined, they may resort to violence to exert control over women's wages as was found in Eswaran and Malhotra (2011), Bobonis et al. (2013), and Heath (2014). In such an outcome, male backlash could cancel out the effect of women's improved outside options. Furthermore, although the improvement in women's relative wages and labour market opportunities have been shown to translate into higher intrahousehold bargaining power in contexts where divorce or separation is commonly practiced, it is unclear whether they play an equally important role as transmission mechanisms where divorce is less widely accepted, such as in Vietnam(Bloch and Rao, 2002; Bulte and Lensink, 2019). This question is pertinent since models of noncooperative bargaining between spouses stress that the income and labour market opportunities of women *at the point of divorce* – and not throughout the marriage – is a function of her intrahousehold bargaining position (Majlesi, 2016). If women cannot credibly both raise and execute the threat of divorce due to social norms, the outside option is practically non-existent in such a model and improvements in women's relative wages and labour market options is not expected to translate into higher intrahousehold bargaining power (Bhalotra et al., 2018; Kotsadam and Villanger, 2022).

This paper uses a difference-in-differences approach which exploits provincial variation in exposure to the BTA akin to Kovak (2013) and Topalova (2010), and gender differences in initial sector composition per Autor et al. (2019). Using three waves of panel data from the Vietnam Household Living Standards Survey, I first assess whether women's outside options improved by examining whether women were more likely than men to reallocate into the wearing apparel sector, and whether their wages increased relative to their husbands. I then move on to examining if, as predicted by the intrahousehold bargaining literature, the improvement in labour market opportunities resulted in higher intrahousehold bargaining power for women.

A key challenge to identifying shifts in women's intrahousehold bargaining position is

that spouses' bargaining power is not observed directly. A common way of proxying for intrahousehold bargaining dynamics is by examining changes in allocation of household resources.[1] Thus, I look at whether households in provinces more exposed to the BTA increased their share of total household expenditure on 'female-preferred' goods such as health, education and food, and less of goods which align with 'male preferences' such as tobacco (Ashraf, 2009; Almås et al., 2018; Armand et al., 2020). I also focus on whether investment into daughters increased relative to sons in provinces more exposed to the BTA.

I find that although women were more likely to work in the wearing apparel sector than men in more liberalised provinces in the 4 years following the implementation of the BTA, and that in these regions women were able to considerably increase their wages relative to their husbands, this did not translate into higher intrahousehold bargaining power. Households in more liberalised provinces did not increase their share of total household expenditure on food, education and health whereas the share of expenditure on tobacco increased. Finally, contrary to what is predicted by Qian (2008) and Heath and Tan (2018), I find that investment in daughters' education did not increase amongst households in provinces where the spousal contribution gap was smaller. These results would lend credence to the explanation that improvements in labour market options for women do not necessarily result in higher intrahousehold bargaining power, and that factors such as social norms may render these effects ineffective in bolstering women's

[1]Field and lab experiments confirm that preferences over how household finances are spent are in fact gendered, and contrary to unitary models of the household which assume that households have a single welfare function, how household resources are allocated should be seen as having resulted from intrahousehold bargaining since men and women have different preferences. Notably, strong female intrahousehold bargaining power has been shown to be associated with higher spending on female private goods and lower consumption of male private goods such as tobacco and alcohol. Strong female bargaining power within the household has additionally been shown to translate into a higher share of household expenditure on public goods that may have intergenerational benefits. Armand et al. (2020) and Almås et al. (2018) find that when the recipient of targeted cash transfers are women, households of all income distribution in Macedonia increased their spending on food. Using Mexican PROGRESA data, Doepke and Tertilt (2019) show that under a noncooperative model of the household where there is a disparity in earnings between spouses, high female bargaining power is correlated with investment in children's human capital. Finally, Qian (2008) and Heath and Tan (2018) demonstrate that when women are empowered at the household-level, investment in daughters increase.

outside option.

This paper contributes to two distinct bodies of literature. The first looks at the impact of access to foreign export markets on the labour market outcomes of workers in developing countries. With respect to studies that look specifically at the effect of the BTA on workers in Vietnam, McCaig (2011) show that low-educated workers experienced an increase in wages, Fukase (2013) record a Stolper-Samuelson type effect where low-skilled workers experienced larger wage growth than skilled workers, and McCaig and Pavcnik (2013) conclude that the share of workers in manufacturing increased by 5 percentage points. However, the aforementioned studies do not consider the differential effects of the BTA on the structural transformation of the female and male labour force despite the fact that the sector which saw the fastest increase in value of export to the US was the female-intensive wearing apparel sector. Thus, in assessing the impact of the BTA on structural transformation in Vietnam, I look also at the different ways in which the Vietnamese male and female labour force responded to access to the US export market.

More broadly, this paper contributes to a growing corpus of research which examines the intersection of trade and gender in developing countries. The majority of studies within this field detail how trade affects the absolute and relative changes in the wages of female workers compared to male workers within the same sector or firm, and there is consensus that through various mechanisms, trade brings about greater gender equality. An explanation for how trade reduces gender inequality is that competitive pressure between manufacturers reduces gender-based discrimination as predicted by the Becker model (Black and Brainerd, 2004). Another explanation is that trade causes manufacturers to undertake technological upgrading which benefits female workers who are thought to have a comparative advantage in brain-based work whereas male workers are considered to have a comparative advantage in brawn-based work (Juhn et al., 2014). Alternatively, trade can alleviate gender inequality in developing economies by expanding female-intensive sectors more rapidly than male-intensive sectors, and

which causes a rise in demand for female workers amongst exporting manufacturers (Aguayo-Tellez et al., 2013). In contrast, Gaddis and Pieters (2017) find that Brazilian microregions which were more exposed to trade liberalisation only saw a reduction in the gap between male and female labour force participation rates because male workers were being displaced from the tradable sector, and crucially, not because women were being absorbed into female-intensive tradable sectors.

However, whether trade alleviates gender inequality at the household level is an under explored area of research, and extant evidence indicate mixed results. Erten and Keskin (2021) record that female workers in Cambodian districts more exposed to tariff cuts arising from accession into the WTO saw an increase in paid employment whereas the reverse was true for male workers, and which caused women to suffer increased instances of intimate partner violence. In other settings however, Aguayo-Tellez et al. (2013) and Majlesi (2016) show that Mexican women were able to command a higher degree of control over the allocation of household resources as a result of the expansion in the manufacturing sector. In Myanmar's case, women residing near factories that were integrated into the global value chain report higher input into household decision-making and lower tolerance for domestic violence (Molina and Tanaka, 2023). In revisiting the subject of trade's impact on women's intrahousehold bargaining position, this paper provides further evidence on the effects of trade on women's intrahousehold bargaining power.

Finally, this paper improves the estimation of the effect of access to foreign export markets in developing countries in two different ways. By using panel data I will be able to control for within-individual differences. Additionally, the BTA provides a unique opportunity to isolate the effect of a positive export shock on women's household-level empowerment as the US granted market access to Vietnamese exporters immediately whereas Vietnam's commitments under the BTA were gradually implemented over the course of 10 years (McCaig and Pavcnik, 2013).

The rest of this paper is organised as follows: Section 2 provides an overview of

the Vietnamese labour force prior to the implementation of the BTA, and summarises the tariffs applied to Vietnamese goods by the US pre and post-BTA. Section 4 looks at the differential effect of the BTA on the structural transformation of male and female workers, and its effect of the spousal contribution gap. Section 5 discusses the effect of the closing of the spousal contribution gap on women's intrahousehold bargaining power. Section 6 discusses why the BTA-induced structural transformation of the female labour force did not result in higher intrahousehold bargaining power for women, and Section 7 concludes.

2 Background

The BTA was signed in July 2000 and came into force on 10 December 2001. Under the BTA, Vietnam was given the status of Most Favoured Nation (MFN), having previously been treated as a Column 2 nation. The switch entailed dis-applying a set of pre-existing tariffs (Column 2 tariffs) and applying another set of pre-existing tariffs (MFN tariffs) which were, importantly for the identification strategy of this paper, not a result of bilateral negotiations (McCaig, 2011; McCaig and Pavcnik, 2018). Since neither the US nor Vietnam were able to negotiate sector-specific tariffs, and since tariffs incurred by Vietnamese exporters were not dependent on pre-existing sector performance, the BTA can be leveraged as a natural experiment for the purposes of this paper. Additionally, although the BTA granted Vietnam MFN status immediately in 2001, Vietnam's obligations under the trade agreement to the US were staggered over the course of 10 years (McCaig, 2011). Moreover, Vietnam had granted the US MFN status prior to the enactment of the BTA. The one-sided nature of the BTA makes it possible to isolate the effect of access to foreign export markets on women's labour market outcomes and intrahousehold bargaining power.

The BTA significantly reduced the cost of Vietnamese imports, with an average tariff reduction of 20 percentage points across all industries. The manufacturing sector ben-

efited the most under the BTA with an average tariff reduction of 30 percentage points whereas the average tariff rate for the non-manufacturing sector fell from 5 percent to 1 percent. As the BTA reduced the cost of exporting light manufactured goods for Vietnamese exporters, the increased volume of trade with the US entailed an increased demand for low-skilled workers in the manufacturing sector. In their papers on the effect of the BTA on the Vietnamese labour market, McCaig and Pavcnik (2018) show that the trade agreement can be attributed to expanding the share of workers in the manufacturing sector by 5 percentage points.

Table 1: Summary of Column 2 and MFN Tariffs for all traded sectors and the manufacturing sector.

Mean Tariff Rate	All sectors	Manufacturing	Non-manufacturing
Column 2	22%	33%	5%
MFN	2%	3%	1%

Figure 1: Sector-level tariff cuts under the BTA.

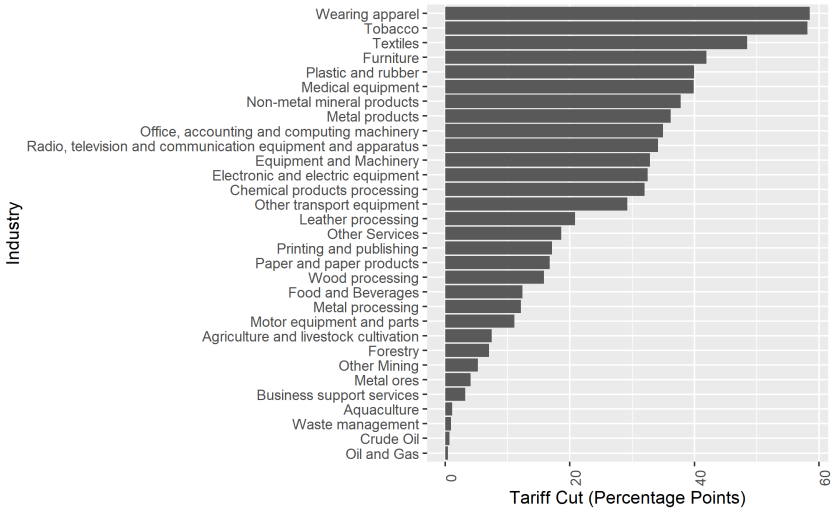


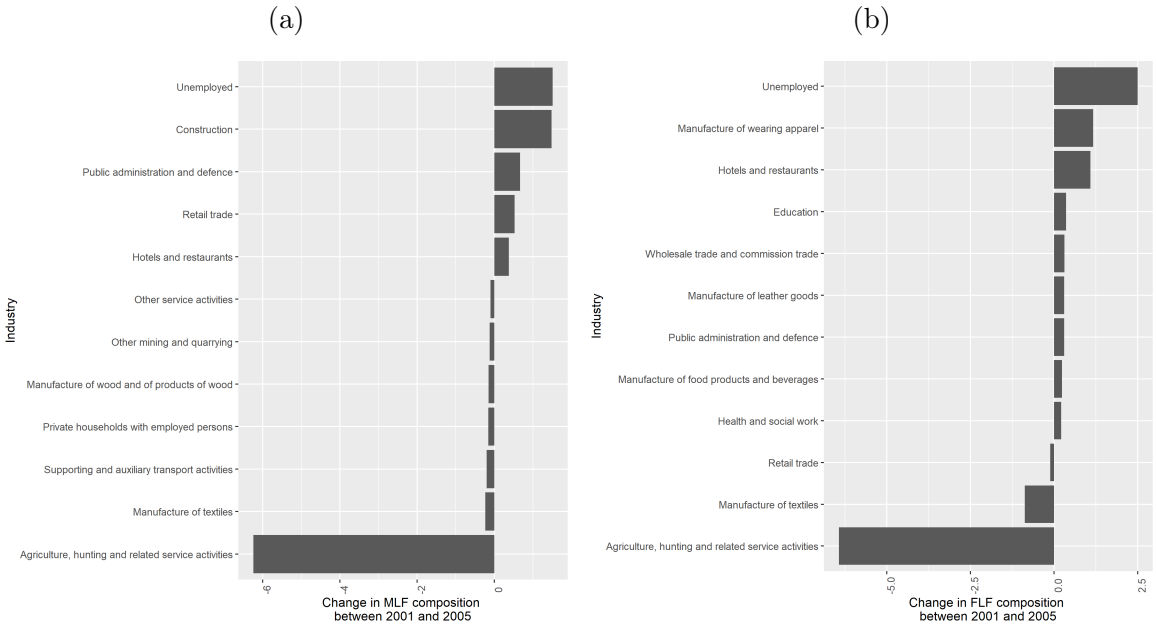
Table 2: Main commodity exports from Vietnam to the US between 1998 and 2006.

SITC Code	SITC Description	1998 Commodity Export Value (million USD)	2006 Commodity Export Value (million USD)	Growth (%)
84	Articles of Apparel and clothing accessories	28	3233	11464.19
85	Footwear	115	952	728.15
33	Petroleum, petroleum products and relate materials	48	911	1815.39
82	Furniture and parts thereof	1	895	74962.8
03	Fish	93	651	598

Source: Author's calculations from data downloaded from the U.S. International Trade Commission's website.

Concomitant to Vietnam's increased trade with the US was the process of structural transformation which the country's labour force underwent. In particular, aggregate employment in the agricultural sector fell from 70 percent of the workforce in 1990 to 58.1 percent in 2006. This reduction was accompanied by an increase in workers in the manufacturing sector from 8 percent in 1990 to 14 percent in 2008 (McCaig and Pavcnik, 2013). While the rate of exit out of the agricultural sector was comparable for male and female workers, female workers largely reallocated into traded sectors whereas male workers tended to reallocate into non-traded sectors. Figure 2, shows the different sectors which grew and shrank by gender of employment composition between 2001 and 2005. As can be seen from panel (b) of Figure 2, the sector which grew the most in terms of the female labour force was wearing apparel sector which grew by 1.16 percentage points. On the other hand, the sector which grew the most during the same period in terms of the male labour force was the construction sector. This difference in destination of where workers reallocated out of the agricultural sector into suggests that while both the male and female labour force underwent structural transformation, the BTA had more of an impact on reallocating female workers. Table 16 in the Appendix A confirms that the male employment structure was less affected by the BTA as the coefficients associated with reallocation into the construction sector, which grew the most in terms of male employment composition between 2001 and 2005, are small and statistically insignificant.

Figure 2: Changes in male and female employment composition between 2001 and 2005.



As the wearing apparel sector predominantly absorbed female workers in the four years subsequently to the enactment of the BTA, and as the foreign wage premium was found to be largest among low-educated women by Fukase (2014), women's outside option is expected to have improved as higher-paid jobs became more accessible. The descriptive statistics found in Table 3 confirm the view that among workers who remained in the agricultural sector and workers who reallocated into the wearing apparel sector, women who reallocated into the wearing apparel sector were the group which increased their wages the most.

Table 3: Wages of men and women who did and did not reallocate into the wearing apparel sector before and after the BTA.

	Did not reallocate		Reallocated	
	Male	Female	Male	Female
2001 Annual Income ('000) VND	3084.45	2771.29	4842.80	3368.45
2005 Annual Income ('000) VND	9023.65	7912.84	14875.20	13396.19
% Change in Wages	192	186	207	298

Source: Author's calculations from panel component of VHLSS 2002/2006.

3 Data

3.1 Tariff data

Data on the tariff schedules applied to Vietnamese imports before and after the BTA was taken from McCaig (2011). To construct sector-level tariffs according to the 3-digit ISIC system, McCaig (2011) matched tariff lines of traded industries in Vietnam with the World Integrated Trade Solution database. This allowed me to then match the aggregated 3-digit ISIC sector tariffs to the 2-digit ISIC sector codes listed in the Vietnam Household Living Standards Survey (VHLSS). For further details on the procedure, please refer to McCaig (2011).

3.2 The Vietnam Household Living Standards Survey

The Vietnam Household Living Standards Survey (VHLSS), conducted by the General Statistics office of Vietnam (GSO), is a nationally representative dataset that is primarily a repeated cross section, but also contains a panel component. The VHLSS contains rich information about each household members' occupation and income, as

well as a breakdown of household expenditure on education, food, and private goods such as tobacco. A key advantage of using the VHLSS to study the impact of the BTA on household allocation of resources is that educational expenditure is itemised at the individual-level. This allows me to determine whether the BTA increased investment in the education of daughters, relative to sons.

Since the recall period for employment and expenditure in the VHLSS is the last 12 months, observations in VHLSS 2002 represent households in the pre-BTA period, whereas the VHLSS conducted in 2004 and 2006 is used to represent households in the post-BTA period.[2]

The panel component for VHLSS 2002 and 2004 will be used to assess the short-term impact of the BTA whereas the panel component for VHLSS 2002 and 2006 will be used to assess the medium-term impact. Throughout the surveys, there are approximately 10,000 households and 31,000 individuals who appear in all three waves of the survey. In addition to restricting my main source of data to those who were interviewed in 2002 and 2006, I also only retain observations who were between the age of 18 and 65 in 2002. For my analysis of the spousal contribution gap, I only retain households which are composed of a wife and husband (and their children), effectively eliminating households which contain parents and in-laws. This is an important step since the focus of this paper is how the intrahousehold bargaining power of women change as their outside options improve, independently of other family members. Another point to note is that since agricultural workers who derive income from their own plot do not receive a wage, my analysis on the relative income of female workers does not cover female agricultural workers who work on their own farm and who do not receive a wage.

[2]As the recall period is 12 months, responses of households who were interviewed in December 2002 pertains to the period just after the BTA came into effect. However, since it is unlikely that the BTA had an effect on the structural transformation of the labour force and the expenditure patterns of households within a month of its implementation, it is fair to assume that responses belonging to households who were interviewed in December 2022 can be treated in the same way as other observations.

4 Structural Transformation

A difference-in-differences strategy that relies on exploiting provincial heterogeneity in exposure to the BTA will be employed to study whether trade-induced structural transformation improved women's labour market opportunities and relative income.

4.1 Province-level tariffs

To measure the extent to which the labour market options for women improved as a result of the BTA, I construct an index of province-level exposure to a trade shock analogous to Topalova (2010) and Kovak (2013). Province-level tariffs are calculated using time-invariant employment-weighted sector tariffs, and is constructed in the following way:

$$(1) \quad Tariff_{pt}^{k} = \sum_{j} \omega_{jp}^{k} \tau_{jt}$$

where $k \in \{1, 2\}$, and τ_{jt} is the tariff applied by the US to Vietnamese goods in sector j at time t. The first measure of province-level tariffs, $Tariff_{pt}^{1}$, is calculated using pre-BTA employment weights (ω_{jp}^{1}) constructed according to Topalova (2010) and takes the following form:

$$(2) \quad \omega_{jp}^{1} = \frac{L_{jp}}{L_{p}^{1}}$$

where L_{jp} is the number of workers in sector j in province p in the year 2001, and L_{p}^{1} is the *total* number of workers in province p (i.e. workers who are occupied in both the traded and non-traded sector) in 2001. For $Tariff_{pt}^{1}$, non-traded sectors are given

a weight of zero and the underlying assumption is that non-traded industries are not directly affected by the BTA (Topalova, 2010; McCaig, 2011).

Conversely, $Tariff_{pt}^{2}$ utilises ω_{jp}^{2} and calculated as below:

$$\omega_{jp}^{2} = \frac{L_{jp}}{L_{p}^{2}} \tag{3}$$

where for each sector j in province p in 2001, I divide the number of workers by the total number of workers in *traded* sectors (L_{p}^{2}) in the year 2001. This pertains to the way in which Kovak (2013) measures exposure to tariff reductions. Unlike $Tariff_{pt}^{1}$, $Tariff_{pt}^{2}$ allows for non-traded sectors to be affected by the BTA due to any spillovers.

$Tariff_{pt}^{k}$ gives the aggregate province-level exposure to the BTA, but does not account for the fact that the BTA expanded male and female-intensive industries deferentially. Given the fact that the wearing apparel sector was female-intensive at the onset of the BTA, I modify (1) per Autor et al. (2019) and exploit variation in the initial female intensity of each sector as follows:

$$Tariff_{pt}^{f,k} = \sum_{j} \frac{f_{jp}}{L_{jp}} \omega_{jp}^{k} \tau_{jt} \tag{4}$$

where f_{jp} is the number of women in sector j in province p, and L_{jp} is the number of workers in sector j in province p in the year 2001.

Using $Tariff_{pt}^{1}$ as a measure for province-level tariffs, the mean province-level tariff cut is 7.68 percentage points whereas $Tariff_{pt}^{2}$ gives a mean province-level tariff cut of 9.29 percentage points.

4.2 Empirical Strategy

To assess the impact of the BTA on the reallocation of male and female workers into the wearing apparel sector, I employ the following linear probability model (LPM) as my baseline model:

$$(5) \quad Apparel_{it} = \beta_1 Tariff_{pt}^{k} + \beta_2 Tariff_{pt}^{k} * Female_i + \alpha_i + \theta_t + \epsilon_{ipt}$$

where $Apparel_{it}$ is an indicator variable which takes the value of 1 if worker i at year t works in the wearing apparel sector, and 0 otherwise. $Tariff_{pt}^{k}$ is the province-level tariff of province p at year t as calculated according to equation (1). $Female_i$ is an indicator variable which takes the value of 1 if worker i is female and 0 if male. The specification includes individual (α_i) and year (θ_t) fixed effects. Individual fixed effects control for within-individual differences, whereas time fixed effects account for macroeconomic shocks that occurred between 2001 and 2003, and 2001 and 2005. The interaction term ($Tariff_{pt}^{k} * Female_i$) was included to ascertain whether the BTA had a larger effect on the structural transformation of the female labour force than the male labour force. Standard errors are clustered at the province-level.

To further assess the effect of BTA-induced expansion of female-intensive sectors on the structural transformation of the male and female labour force, I replace the dependent variable in equation (5) with $Tariff_{pt}^{f,k}$.

Crucial to note is that since the parameters in equation (5) estimate the one percentage point increase in $Tariff_{pt}^{k}$ on the probability of working in the apparel sector, a *negative* value for β_1 and $\beta_1 + \beta_2$ would indicate that a reduction in $Tariff_{pt}^{k}$ is associated with an *increase* in the probability of working in the wearing apparel sector.

4.2.1 Spousal contribution gap

I then turn to look at the effect of the BTA on women's relative income by examining the spousal contribution gap to the total household income with the following two-way fixed effects (TWFE) model:

$$(6) \quad ShareInc_{it} = \pi Tariff_{pt}^{k} + \alpha_i + \theta_t + \epsilon_{ipt}$$

where $ShareInc_{it}$ is the real annual income of female worker i in year t as a share of her total annual household income in the same year. All other independent variables are as described in equation (5).

4.3 Results

4.3.1 Structural transformation

The results for the estimates of the effect of the BTA on the reallocation of workers into the wearing apparel sector are reported in Table 4. In all specifications, the coefficients associated with female workers' probability of working in the wearing apparel sector ($\beta_1 + \beta_2$) are larger than the coefficients associated with male workers (β_1), indicating that the BTA had a larger effect on the structural transformation of the female labour force more than the male labour force. The coefficients in column 1 of Panel A show that the average tariff reduction in $Tariff_{pt}^{1}$ of 7.69 percentage points correspond to an increase in the number of female workers in the wearing apparel sector by 2.48 percentage points, and male workers by 1.7 percentage points between 2001 and 2003. The coefficients in column 3 of Panel A are slightly smaller than those in column 1, and indicate that the BTA led to an increase in the number of female workers in the wearing apparel sector by 1.7 percentage points. The coefficients for the interaction

term are negative in all specifications, and supports the notion that the BTA had a differential effect in the reallocation of male and female workers. However, it must be noted that although the interaction term using the panel element of VHLSS 2001 and 2003 are statistically significant at the 1 percent level, it loses its statistical significance when employing the panel element of VHLSS 2001 and 2005.

When accounting for gender differences in initial sector composition, the results are qualitatively similar to the results using $Tariff_{pt}^{k}$ as can be seen in Panel B of Table 4.

Table 4: Results for the TWFE model on the effect of the BTA on working in the wearing apparel sector.

Panel A. Overall trade shock

Dependent Variable:	Working in the wearing apparel sector			
Measure of province-level tariff (k):	1	2	1	2
$Tariff_{pt}^{k}$	-0.2213**	-0.0585**	-0.1875	-0.0600*
	(0.1050)	(0.0277)	(0.1266)	(0.0340)
× Female	-0.1012***	-0.0615***	-0.0316	-0.0141
	(0.0143)	(0.0080)	(0.0307)	(0.0223)
$\beta_1 + \beta_2$	-0.3231***	-0.1204***	-0.2210*	-0.0753**
	(0.1093)	(0.0278)	(0.1125)	(0.0301)
Observations	76,762	76,762	35,215	35,215
R^2	0.78278	0.78283	0.83012	0.83013
Within R^2	0.00257	0.00276	0.00097	0.00105

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Panel B. Accounting for initial female-employment share

Dependent Variable:	Working in the wearing apparel sector			
Measure of province-level tariff (k):	1	2	1	2
$Tariff_{pt}^{f,k}$	-0.1950***	-0.0537**	-0.1612*	-0.0546*
	(0.0661)	(0.0212)	(0.0846)	(0.0275)
× Female	-0.0935***	-0.0570***	-0.0300	-0.0135
	(0.0129)	(0.0077)	(0.0298)	(0.0217)
$\beta_1 + \beta_2$	-0.2891***	-0.1112***	-0.1929***	-0.0694***
	(0.0694)	(0.0204)	(0.0703)	(0.0229)
Observations	76,762	76,762	35,215	35,215
R^2	0.79561	0.79555	0.84396	0.84388
Within R^2	0.00265	0.00238	0.00210	0.00156

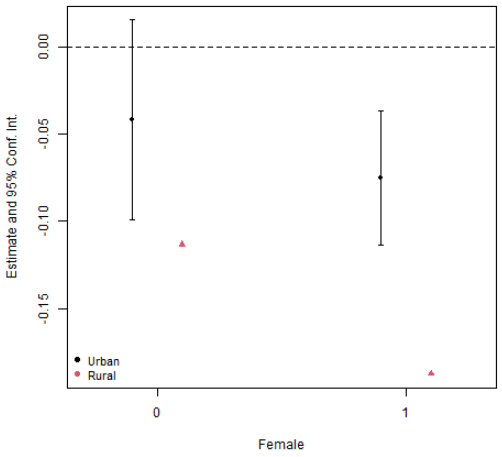
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Note: Column 1 and 2 are results from the panel component of VHLSS 2002 and 2004. Column 3 and 4 are results from the panel component of VHLSS 2002 and 2006. All specifications include individual and year fixed effects. Standard errors are clustered at the province level.

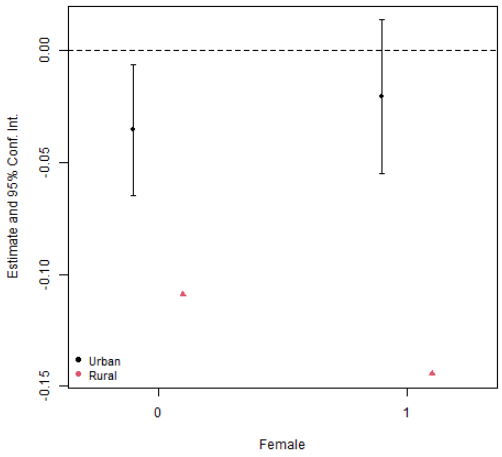
To gain a better understanding of the spatial heterogeneity of the effect BTA on the structural transformation of workers within provinces, I repeat the analysis in Table 4 while only retaining rural and urban observations respectively. The results are represented in Figure 3 and across all specifications, the coefficients associated with

Figure 3: Results for the TWFE model on the effect of the BTA on working in the wearing apparel sector, by urban.

(a) 2001 - 2003



(b) 2001 - 2005

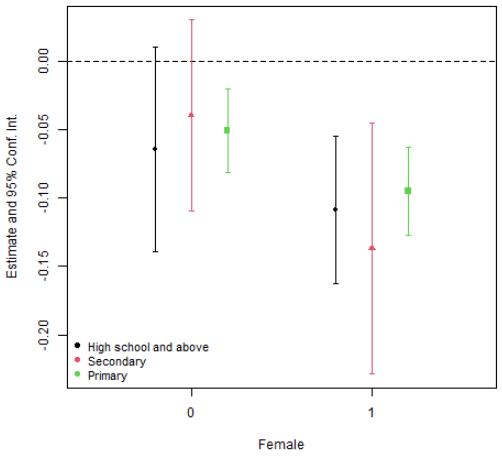


provincial exposure to the BTA for rural workers are approximately three times as large as those for urban workers. These results are in line with the findings by McCaig (2011) that the anti-poverty effects of the BTA were concentrated among rural workers, and also provides evidence that the reallocation of labour into the wearing apparel sector contributed to trade-induced poverty reduction.

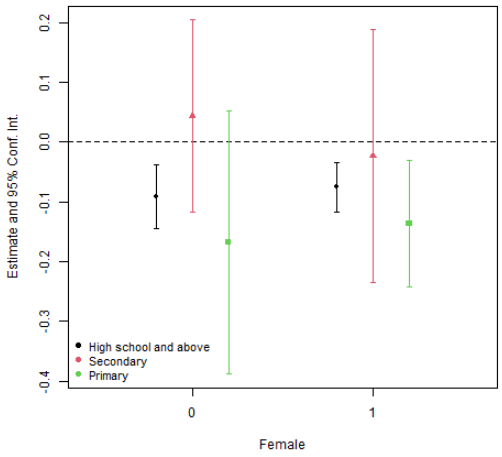
Additionally, since jobs within the wearing apparel sector are predominantly low-skilled, it is worthy of further examination the effect of the BTA on workers of different education levels. Thus, I implement equation (5) on three separate subsets of workers: (i) those who had a high school education or above, (ii) those who had a secondary school education, and (iii) those who had a primary school education or below at the onset of the implementation of the BTA. The results reported in Figure 4 show that while female workers with a secondary school education were the most likely to work in the wearing apparel sector between 2001 and 2003, it is female workers with a primary school education or below who were the most likely to work in this sector by 2005. This is, again, consistent with McCaig (2011) who found that workers with at most a primary school education were the most receptive to the effects of the BTA.

Figure 4: Results for the TWFE model on the effect of the BTA on working in the wearing apparel sector, by education level.

(a) 2001 - 2003



(b) 2001 - 2005



4.3.2 Spousal contribution gap

The results for the parameters in equation (6), which estimates the effect of the BTA on women's relative income, as measured by her contribution towards the total household income, is given in Table 5. Comparing the coefficients derived from the panel element of VHLSS 2002/2004 to those of VHLSS 2002/2006, the BTA did not affect the spousal contribution gap in the short-term but allowed women to close the spousal contribution gap 4 years after its implementation. The medium-term results of the BTA on the spousal contribution gap are not merely statistically significant, but also economically significant; on aggregate, women increased their share of contribution to the total household income by 4.14 to 10.8 percentage points between 2001 and 2005 as a result of Vietnam's increased access to the US export market. The results do not deviate significantly when adopting $Tariff_{pt}^{f,k}$ as a measure of provincial exposure to the BTA.

Table 5: Results for the TWFE model on the effect of the BTA on women's relative wages.

Panel A. Overall trade shock

Dependent Variable:	Women's contribution towards total household income (%)			
Measure of province-level tariff (k):	1	2	1	2
$Tariff_{pt}^{k}$	0.4385**	0.0834	-1.407***	-0.4466***
	(0.2111)	(0.0821)	(0.3807)	(0.0779)
Observations	6,933	7,536	3,315	3,315
R^2	0.84809	0.79200	0.85299	0.85344
Within R^2	0.00157	0.00048	0.01184	0.01483

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Panel B. Accounting for initial female-employment share

Dependent Variable:	Women's contribution towards total household income (%)			
Measure of province-level tariff (k):	1	2	1	2
$Tariff_{pt}^{f,k}$	0.4050***	0.0965	-0.9938***	-0.3685***
	(0.1350)	(0.0587)	(0.2935)	(0.0754)
Observations	6,933	7,536	3,315	3,315
R^2	0.84819	0.79207	0.85270	0.85311
Within R^2	0.00222	0.00080	0.00989	0.01262

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

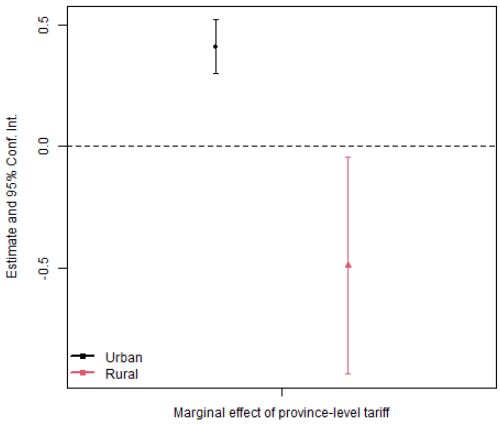
Note: Column 1 and 2 are results from the panel component of VHLSS 2002 and 2004. Column 3 and 4 are results from the panel component of VHLSS 2002 and 2006. All specifications include household and year fixed effects. Standard errors are clustered at the province level.

As established above in section 4.3.1, there was large spatial variation within provinces regarding the effect of the BTA on structural transformation. To further understand whether the reallocation of female rural women into the wearing apparel sector is also associated with an increase in relative wages for rural women, I split the observations by urban-rural status and rerun the TWFE model given by equation (6). While the result in Table 5 indicate that, on aggregate, the BTA did not affect women's relative wages until 4 years after the implementation of the BTA, Figure 5 shows that the BTA allowed rural women to close the spousal contribution gap as soon as 2003. This is consistent with the findings in Figure 3, that the labour market benefits associated with the BTA-induced structural transformation are concentrated among rural workers.

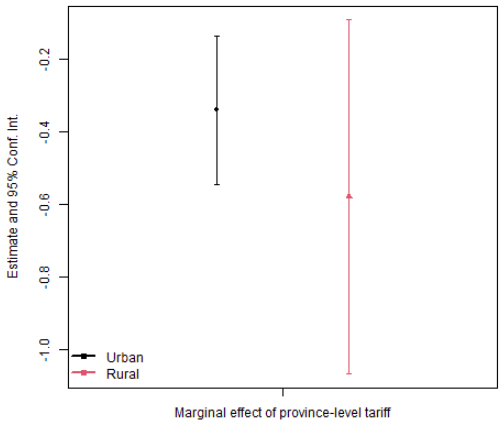
With regards to the heterogeneous effects of the BTA on closing the spousal contri-

Figure 5: Results for the TWFE model on the effect of the BTA on women's relative wages, by urban.

(a) 2001 - 2003



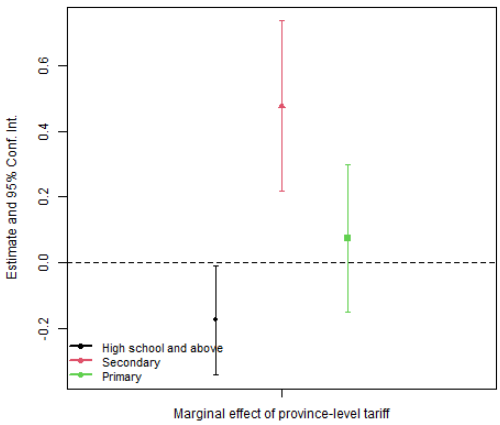
(b) 2001 - 2005



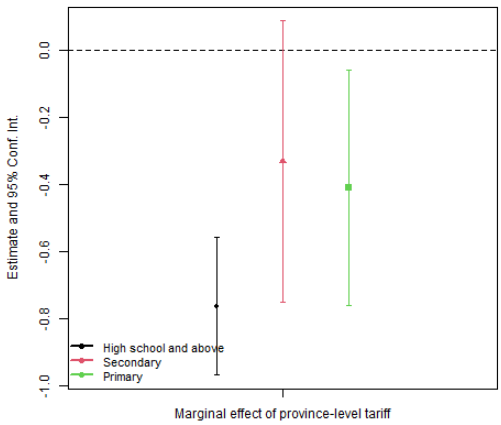
bution gap by education level of the wife, the results in Figure 6 show that women with a high school education and above were able to increase their relative wages the most in both the short and medium term. In contrast, women with a primary school education were able to close the spousal contribution gap after 2 years of the implementation of the BTA, whereas the same cannot be said for women with a secondary school education where their relative incomes were largely unaffected by the BTA for both time periods.

Comparing these results to those in Figure 4, there is a discrepancy in the finding that although women with a secondary school education were the most likely to work in the wearing apparel sector in the two years following the implementation of the BTA, women of this education level increased their relative incomes the least during the same period of time. However, panel (b) of Figures 4 and 6 are closely aligned in the finding that women with a higher school education or above, or women with a primary school education or below are the groups which improved the labour market outcomes the most as a result of the BTA in the medium term.

Figure 6: Results for the TWFE model on the effect of the BTA on women's relative wages, by education level.



(a) 2001 - 2003



(b) 2001 - 2005

5 Intrahousehold Bargaining

Having established that women in provinces that were more exposed to the BTA improved their outside option through having better access to higher-paid jobs in the wearing apparel sector, I turn to look at whether households in more liberalised provinces increased their share of expenditure on goods that have been shown by lab and field experiments to be reflective of female preferences. In line with Bobonis (2009), Almås et al. (2018) and Armand et al. (2020), I examine whether household in more liberalised provinces increased their expenditure on education, food and healthcare. Additionally, I look at whether households who resided in provinces more exposed to tariff cuts reduced their consumption of tobacco, considered to be a 'male-preferred' good by Duflo and Udry (2004) and Bobonis (2009). To measure the impact of the BTA on changes in household expenditure and consumption patterns, the following TWFE model is implemented:

$$(7) \quad Share^{g}_{ht} = \gamma Tariff^{k}_{pt} + \delta_h + \theta_t + \epsilon_{hpt}$$

where $Share^{g}_{ht}$ is the real expenditure on good g as a share of total household expenditure by household h in year t. All other independent variables are as described in equation (6).

Since the VHLSS provides a detailed account of how much each household spent on the education of each child, I build on the studies by Qian (2008) and Heath and Tan (2020) to look at whether a reduction in the spousal contribution gap led to an increase in investment in daughters' education using the following TWFE model:

$$(8) \quad Investment_{it} = \phi_1 Tariff^{k}_{pt} + \phi_2 Tariff^{k}_{pt} * Daughter_i + \delta_h + \theta_t + \epsilon_{hpt}$$

where $Investment_{ht}$ is the real educational expenditure towards child i in year t. $Daughter_i$ is an indicator variable which takes the value of 1 if child i is female and 0 otherwise. By including household fixed-effects (δ_h) I can control for within-household differences whilst the interaction term $Tariff^{k}_{pt} * Daughter_i$ allows for the determination of whether households in more provinces more exposed to the BTA increased investment into daughters' education relative to sons.

5.1 Results

Tables 6 and 8 provide the results for the effect of the BTA on the allocation of goods towards female and male-preferred goods respectively. Contrary to Armand et al. (2020), the positive coefficients displayed in columns 1 and 2 of both panels of Table 6 indicate that households located in provinces that were more exposed to the BTA,

and where women arguably had better outside options, reduced their expenditure on food as a share of total household expenditure more than households in less liberalised provinces.

With regards to whether the closing of the spousal contribution gap led to an increase in household expenditure on education, columns 3 and 4 of Panel A indicate that expenditure on education as a share of total household expenditure also decreased in the two years following the implementation of the BTA, while column 4 of Panel B yields similar results for changes that occurred after four years. These results contradict the findings by Bobonis (2009) that increasing women's relative income entail greater investment in education. However, the coefficients associated with household expenditure on education here are statistically insignificant and are also substantively very small, with the average provincial exposure to the BTA translating to a 1 percentage point decrease in investment into education as a share of total household expenditure. Finally, columns 5 and 6 of both panels of Table 6 also indicate that the share of household expenditure on health decreased, although this effect is also both economically and statistically insignificant.

Table 6: Results for the TWFE model on the effect of the BTA on household expenditure on various public goods as a share of total household expenditure.

Panel A. 2001 - 2003

% of total household expenditure spent on:	Food		Education		Health	
Measure of province-level tariff (k):	1	2	1	2	1	2
$Tariff_{pt}^{k}$	0.8154**	0.1327	0.0135	0.0284	0.0745	0.0158
	(0.3661)	(0.0952)	(0.1244)	(0.0473)	(0.2955)	(0.0915)
Observations	14,399	14,399	14,399	14,399	14,399	14,399
R^2	0.96330	0.96311	0.94142	0.94143	0.95142	0.95141
Within R^2	0.00652	0.00161	5.58×10^{-6}	0.00023	9.95×10^{-5}	4.19×10^{-5}

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Panel B. 2001 - 2005

% of total household expenditure spent on:	Food		Education		Health	
Measure of province-level tariff (k):	1	2	1	2	1	2
$Tariff_{pt}^{k}$	0.9588**	0.2394	-0.0776	0.0010	-0.0341	0.1034*
	(0.4494)	(0.1514)	(0.1956)	(0.0603)	(0.3927)	(0.0552)
Observations	7,129	7,129	7,129	7,129	7,129	7,129
R^2	0.95794	0.95780	0.94952	0.94950	0.93363	0.93376
Within R^2	0.00979	0.00656	0.00022	3.96×10^{-7}	2.05×10^{-5}	0.00202

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Note: All specifications include household and year fixed effects, and standard errors are clustered at the province-level.

Table 7 presents the parameters given by equation (8), and captures the differential effect of the BTA on investment into sons and daughters' education. According to Qian (2008) and Heath and Tan (2020), the economic empowerment of women at the household-level can lead to greater investment into daughters since mothers place more emphasis on investing in daughters than fathers do. However, the coefficient of the interaction term $Tariff_{pt}^{k} \times Daughter_i$ is statistically insignificant, suggesting that the BTA-induced reallocation of female labour into higher-paying jobs did not result

in greater educational investment into daughters.

Table 7: Results for the TWFE model on the effect of the BTA on household expenditure on education.

Dependent Variable:	(log) real expenditure on education			
Measure of province-level tariff (k):	1	2	1	2
$Tariff_{pt}^{k}$	2.528	1.376***	2.040	1.346**
	(0.3148)	(0.3436)	(3.022)	(0.6114)
× Daughter	0.1756	0.1759	-0.0861	0.0423
	(0.3148)	(0.2094)	(0.4802)	(0.3212)
$\phi_1 + \phi_2$	2.705	1.553***	1.959	1.391*
	(2.270)	(0.3939)	(3.073)	(0.7040)
Observations	22,605	22,605	9,870	9,870
R^2	0.96482	0.96508	0.97114	0.97133
Within R^2	0.00385	0.01123	0.00200	0.00854

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Note: Column 1 and 2 are results from the panel component of VHLSS 2002 and 2004. Column 3 and 4 are from the panel component of VHLSS 2002 and 2006. All specifications include household and year fixed effects, and standard errors are clustered at the province-level.

While the previous results detail that the increase in women's relative wages did not lead to greater share of household expenditure on 'female-preferred' goods nor daughters' education, Table 8 and Table 22 show that household expenditure on tobacco increased more, both as a share of total household expenditure and in real monetary terms. More specifically, the coefficients in column 4 of Tables 8 and 22 translate to a 1 percentage point increase or 10 percent increase in expenditure on tobacco. However, all coefficients associated with the (log) real monetary household consumption of tobacco are statistically insignificant. Thus, even though the BTA did not lead to the increase in household expenditure on goods that are indicative of higher female intra-household bargaining power, it did not lead to higher consumption of 'male-preferred'

goods that signify the presence of male backlash in the form of control over wives' income either.

Table 8: Results for the TWFE model on the effect of the BTA on household expenditure on tobacco.

% of total household expenditure spent on:	Tobacco			
Measure of province-level tariff (k):	1	2	1	2
$Tariff_{pt}^{k}$	0.0253	0.0127	-0.2466	-0.1064***
	(0.0657)	(0.0218)	(0.1487)	(0.0246)
Observations	14,399	14,399	7,129	7,129
R^2	0.96062	0.96064	0.93708	0.93840
Within R^2	0.00028	0.00067	0.02067	0.04135

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Note: Columns 1 and 2 are from the panel component of VHLSS 2002 and 2004. Columns 3 and 4 from the panel component of VHLSS 2002 and 2006. All specifications include household and year fixed effects, and standard errors are clustered at the province level.

6 Discussion

What could explain the results in Tables 6 and 8? One way to rationalise the reduction in food expenditures is that as households prosper and their total expenditure increases, the share allocated to food decreases per Engel's law. To test this hypothesis, I replace the dependent variable in equation (7) with the (log) real monetary value of household expenditure on the same household goods. The results can be viewed in Table 20 in the Appendix and does not lend credence to the explanation that households merely spent a smaller share of their total household expenditure on food. While the coefficients for the real monetary value of household expenditure on food using VHLSS 2002 and 2004 are negative, the coefficients using VHLSS 2002 and 2006 are positive suggesting that households in more liberalised areas also reduced their real expenditure on food more

than households in less liberalised areas in the medium-term.

Likewise, the results in column 3 and 4 of Table 20 indicate that households in provinces that experienced the average tariff cut in $Tariff_{pt}^{1}$ invested approximately 14 percent less into education in real monetary terms than households in provinces that did not experience any tariff cuts. These results, while refuting evidence provided by Bobonis (2009) is aligned with those found in Blanchard and Olney (2017) and Leight and Pan (2020) who found that if access to foreign export markets favour low-skilled workers (as was the case with the BTA), the opportunity cost for remaining in school increases and causes a diversion away from investment into education. Thus, even if women's intrahousehold bargaining power increased as a result of Vietnam's access to US markets, it may not have been manifested in household expenditure on education because the BTA concomitantly increased the opportunity-cost for staying in school.

Moreover, emphasised within models of noncooperative bargaining between spouses is that a positive shock to the wife's relative income and an improvement in her labour market opportunities act as transmission mechanisms for women's household-level empowerment since these factors make her threat of divorce credible when negotiations between the spouses break down (Lundberg and Pollak, 1994; Lim et al., 2007; Heath and Tan, 2020). However, women may be prevented from leveraging her threat of divorce if it is not widely practiced due to social norms (Bhalotra et al., 2018; Kotsadam and Villanger, 2022). Thus, one explanation as to why the BTA did not result in greater household expenditure on 'female-preferred' goods is that access to foreign export markets did not bolster women's outside option in the Vietnamese context.

To evaluate whether social norms surrounding divorce prevented women from being empowered at the household-level despite the BTA-induced structural transformation of the female labour force, I gauge the extent to which divorce was accepted in Vietnam by relying on data from the World Values Survey (WVS). The WVS grew out of the European Values Survey by Ronald Inglehart from the University of Michigan in 1981, and which now covers over 120 countries (Inglehart et al., 2018). The purpose of

the WVS is to collect nationally representative cross-sectional data on citizens' beliefs encompassing a wide range of topics including gender norms, religious values, and social values. Of particular interest to this paper is that the WVS gauges perceptions on divorce through the following question:

> Please tell me for each of the following actions whether you think it can always be justified, never be justified, or something in between:
>
> 1. Divorce

Respondents are able to provide a score ranging from 1 to 10, with 1 indicating that divorce is 'never justifiable' and 10 being that divorce is 'always justifiable'. Since the fourth wave and fifth wave of the WVS were conducted in Vietnam in 2001 and 2005 respectively, the WVS can be employed to examine the perception of divorce in Vietnam prior to the implementation of the BTA, and 4 years after it.

Column 2 of Table 9 provides descriptive statistics on the share of Vietnamese respondents from the WVS who stated that divorce was 'never justifiable', and demonstrates that not only was there an initially high level of disapproval regarding divorce, this pattern did not shift as Vietnam underwent structural transformation. Furthermore, the extent to which respondents thought that divorce was justifiable was generally low with a mean score of 2.56 in 2001 and 2.33 in 2005. There was also very little variation in respondents' view on divorce as can be seen from the low standard deviation values in Column 3, nor was there much heterogeneity by sex as can be seen from comparing the statistics in Panel A and Panel B of Table 9.

Table 9: Descriptive statistics on norms and values on divorce in Vietnam between 2001 and 2005.

Panel A. All observations

	Never justifiable (%)	Mean	S.D.
2001	51.60	2.56	0.07
2005	54.72	2.33	0.05

Panel B. Female

	Never justifiable (%)	Mean	S.D.
2001	53.1	2.55	0.09
2005	55.1	2.36	0.08

Panel C. Male

	Never justifiable (%)	Mean	S.D.
2001	49.1	2.71	0.09
2005	55	2.32	0.07

Source: Author's own calculations from the Wave 4 and Wave 5 of the World Values Survey.

Taken together, the descriptive statistics in Table 9 suggest that an explanation for why households in provinces that were more exposed to the BTA did not increase their share of total household expenditure on 'female-preferred' goods can be found in the anti-divorce nature of Vietnamese social norms. In other words, a plausible reason for why women's intrahousehold bargaining position did not increase despite the BTA-induced improvement in wives' relative wages and labour market options is that, without a concurrent shift the acceptableness of divorce, women are unable to

credibly raise the threat of divorce in situations of noncooperative bargaining with their husband.

Indeed, Table 24 in the Appendix confirms the hypothesis that the BTA-induced structural transformation did not lead to greater divorce; only in the specification employing $Tariff_{pt}^2$ on the panel element of VHLSS 2002 to 2004 is the coefficient for exposure to the BTA statistically significant. Even then, the result for the effect of the BTA on divorce is economically insignificant with the average province-level tariff cut translating to an under 1 percentage point increase in the probability of getting divorced. This is in contrast to Heath and Tan (2020) who found that the Hindu Succession Act, which provided some groups of Indian women a positive and exogenous shock to their unearned income by improving their ability to inherit land, led to greater instances of divorce in India and which also increased women's intrahousehold bargaining position.

It is also plausible that, contrary to the explanation provided above, improvements in women's relative wages and labour market opportunities do indeed strengthen women's outside options; however, this process may take more than the 4 years studied within this paper to manifest itself in the allocation of household resources. Given the data restrictions of this paper, it was not possible to empirically test whether households increased their share of expenditure on 'female-preferred' goods after 2005. On the other hand, Qian (2008) and Majlesi (2016) detail that the disproportionate expansion of female-intensive sectors resulted in higher female intrahousehold bargaining power after 3 years. Thus, the medium to long-term effects of the BTA on household inequality is an area for future research.

7 Conclusion

While it is well established that trade can promote gender equality at the firm and sector-level by increasing female labour force participation and wages of women, it is

unclear as to whether this effect is mirrored at the household-level. This paper provides further evidence, where there is few, for the effect of access to foreign export markets on household-level gender equality in developing countries. Specifically, I provide evidence that the BTA-induced expansion of the female-intensive wearing apparel sector improved women's labour market opportunities in Vietnam. I also show that the BTA-induced structural transformation of the female labour force enabled women to improve their income relative to their husbands, and which allowed women to close the spousal contribution gap.

However, contrary to what has been predicted by models of non-cooperative intrahousehold bargaining, the improvement in women's labour market opportunities and relative income did not lead to an increase in household expenditure on goods considered to be aligned with female preferences. This is indicative of the fact that improvements in the aforementioned is an important, but not sufficient condition to reinforcing women's outside options; social norms surrounding divorce, male identity and female employment can be persistent in hindering women's household-level empowerment. However, data restrictions meant that I was not able to pinpoint which of the norm(s) played a role in hindering women's intrahousehold bargaining power. Thus, how social norms and female employment interact with each other at the household-level is a promising area for future research.

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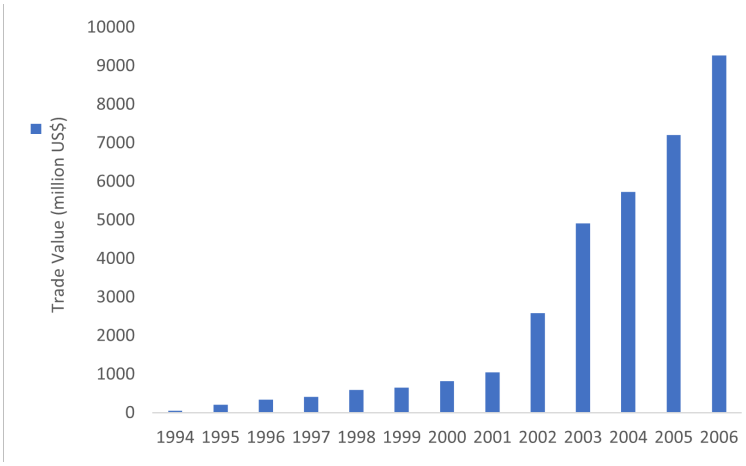
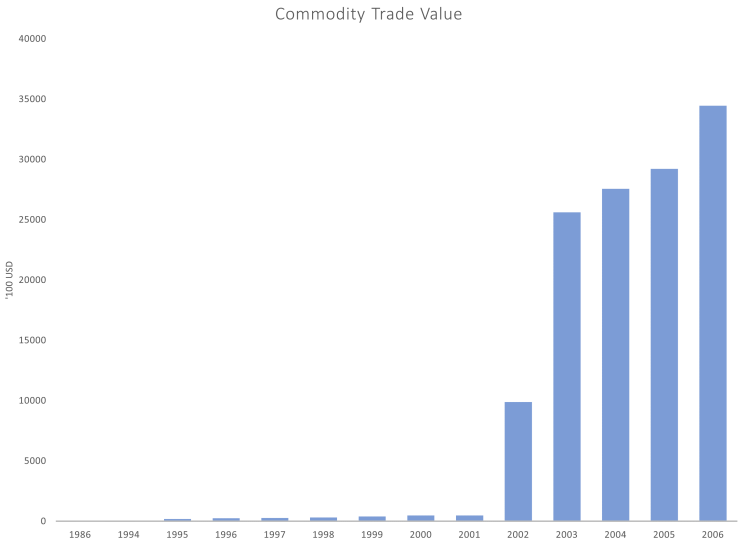
A Appendix

Figure 7: Value of exports of all Vietnamese goods to the US between 1994 and 2006

(a) All goods



(b) Wearing apparel



Source: Author's calculations from COMTRADE data.

Table 10: Top five sectors in terms of male employment composition pre and post BTA.

(a) 2001

Sector	Share (%)
Agriculture	43.54
Construction	7.54
Retail trade	4.89
Fishing, operation of fish farms	4.02
Land transport	3.98

(b) 2005

Sector	Share (%)
Agriculture	37.30
Construction	9.03
Retail trade	5.41
Land transport	4.17
Fishing, operation of fish farms	4.08

Table 11: Top five sectors in terms of female employment composition pre and post BTA.

(a) 2001

Sector	Share (%)
Agriculture	49.80
Retail trade	14.22
Education	10.53
Hotels and restaurants	3.45
Manufacture of wearing apparel	2.33

(b) 2005

Sector	Share (%)
Agriculture	43.37
Retail trade	16.73
Education	4.48
Hotels and restaurants	3.81
Manufacture of wearing apparel	3.50

Figure 8: Change in province-level share of male and female employment in agriculture versus change in province-level share of male and female employment in the manufacturing sector between 2001 and 2005

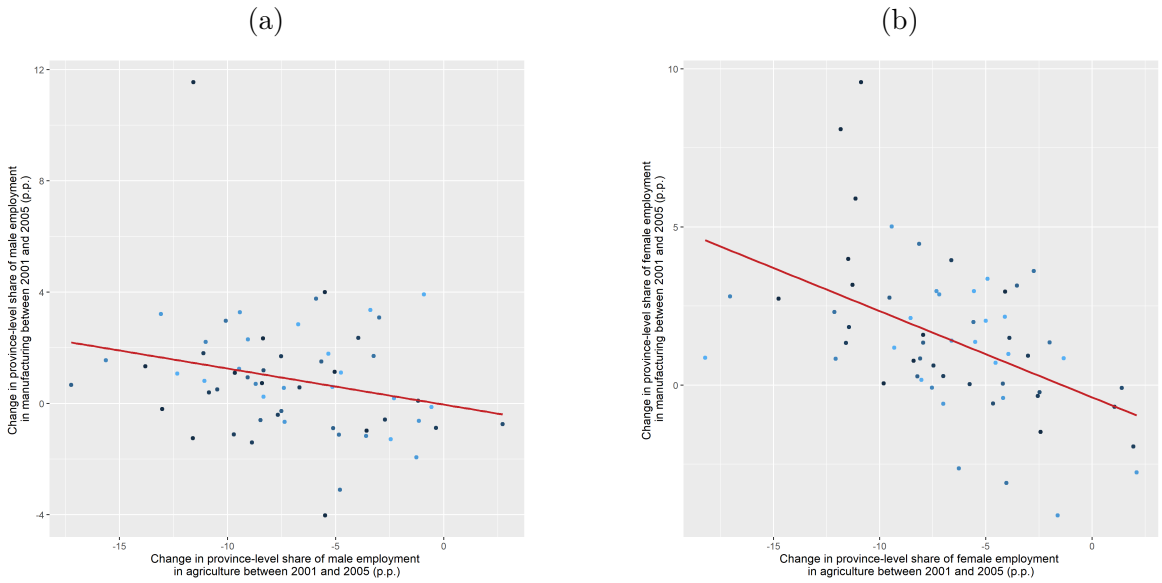


Figure 9: Change in province-level tariff versus change in province-level share of male and female employment in the agricultural sector between 2001 and 2005

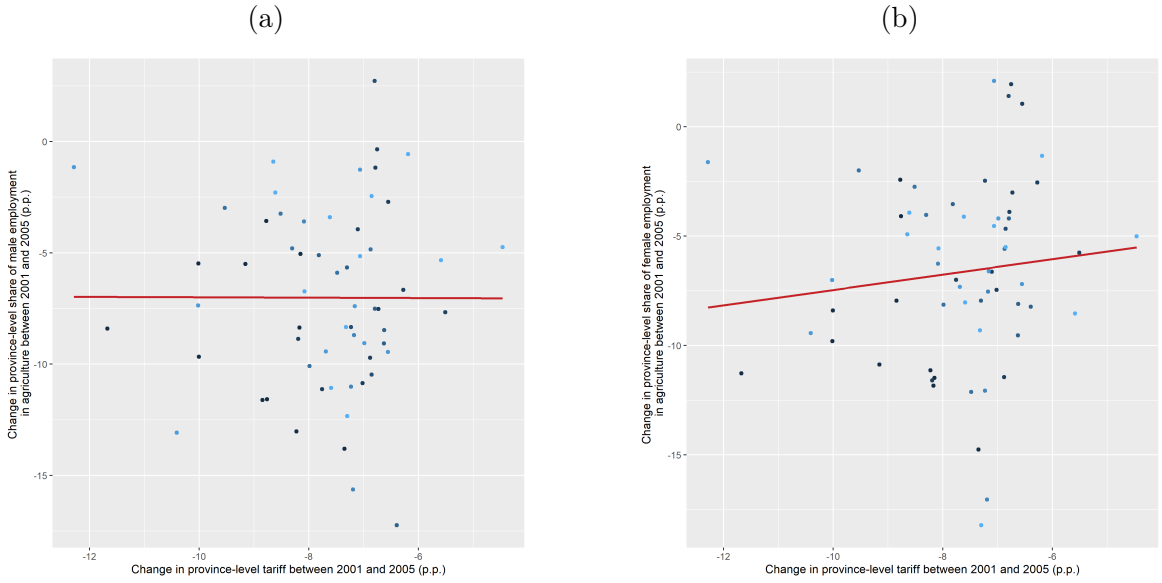
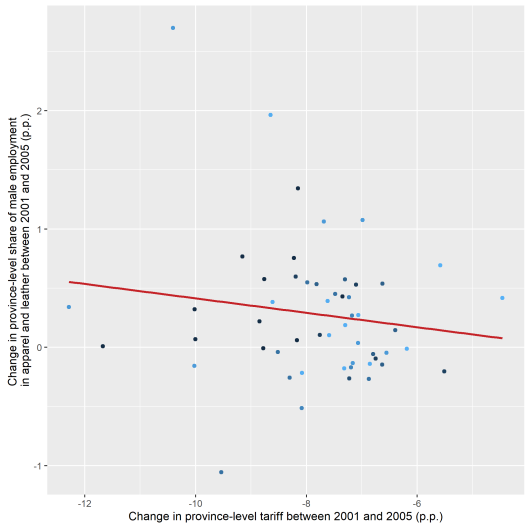


Figure 10: Change in province-level tariff versus change in province-level share of male and female employment in the wearing apparel and leather sector between 2001 and 2005

(a)



(b)

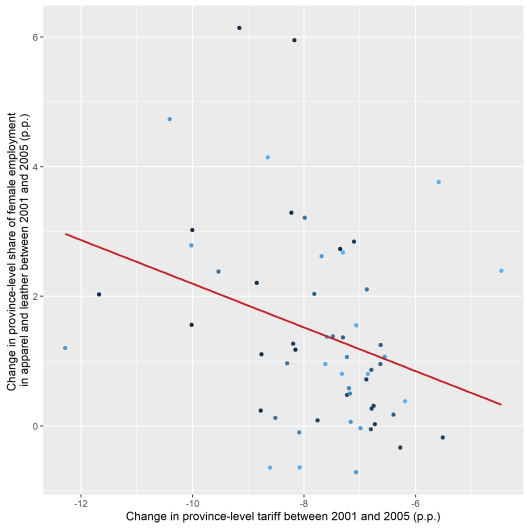


Table 12: Results for the TWFE model on the effect of the BTA on working in the wearing apparel sector, by urban

Panel A. Rural workers

Dependent Variable:	Working in wearing apparel sector			
Measure of province-level tariff (k):	1	2	1	2
$Tariff_{pt}^{k}$	-0.3273	-0.1541*	-0.3189	-0.1621
	(0.2086)	(0.0792)	(0.3816)	(0.1860)
× Female	-0.1153***	-0.0883***	-0.0559**	-0.0415**
	(0.0275)	(0.0231)	(0.0279)	(0.0199)
$\beta_1 + \beta_2$	-0.4437*	-0.2432**	-0.3781	-0.2058
	(0.2293)	(0.0988)	(0.3947)	(0.1970)
Observations	57,578	57,578	26,283	26,283
R^2	0.74773	0.74824	0.84031	0.84058
Within R^2	0.00415	0.00616	0.00272	0.00438

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Panel B. Urban workers

Dependent Variable:	Working in wearing apparel sector			
Measure of province-level tariff (k):	1	2	1	2
$Tariff_{pt}^{k}$	-0.1645*	-0.0421	-0.0906	-0.0354**
	(0.0970)	(0.0292)	(0.0553)	(0.0149)
× Female	-0.0756***	-0.0335**	0.0156	0.0147
	(0.0268)	(0.0136)	(0.0447)	(0.0209)
$\beta_1 + \beta_2$	-0.2396***	-0.0754***	-0.0750	-0.0207
	(0.0799)	(0.0196)	(0.0453)	(0.0175)
Observations	19,184	19,184	8,932	8,932
R^2	0.82066	0.82065	0.82302	0.82304
Within R^2	0.00125	0.00118	0.00014	0.00024

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Note: Column 1 and 2 are results from the panel component of VHLSS 2002 and 2004. Column 3 and 4 are results from the panel component of VHLSS 2002 and 2006. All specifications include individual and year fixed effects. Standard errors are clustered at the province level.

Table 13: Results for the TWFE model on the effect of the BTA on working in the wearing apparel sector, by education level.

Panel A. High school or above

Dependent Variable:	Working in the wearing apparel sector			
Measure of province-level tariff (k):	1	2	1	2
$Tariff_{pt}^{k}$	-0.2336***	-0.0477*	-0.4237***	-0.0953***
	(0.1101)	(0.0381)	(0.0797)	(0.0272)
× Female	-0.1037**	-0.0449*	-0.0029	0.0153
	(0.0405)	(0.0249)	(0.0623)	(0.0336)
$\beta_1 + \beta_2$	-0.3648***	-0.1091***	-0.3365***	-0.0754***
	(0.0895)	(0.0275)	(0.0777)	(0.0210)
Observations	47,693	47,693	22,716	22,716
R^2	0.90544	0.90538	0.92473	0.92466
Within R^2	0.00146	0.00085	0.00221	0.00124

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Panel B. Secondary school

Dependent Variable:	Working in the wearing apparel sector			
Measure of province-level tariff (k):	1	2	1	2
$Tariff_{pt}^{k}$	-0.2207*	-0.0456	-0.0486	0.0270
	(0.1121)	(0.0407)	(0.1458)	(0.1081)
× Female	-0.1505***	-0.1021***	-0.0822	-0.0674
	(0.0275)	(0.0145)	(0.0979)	(0.0707)
$\beta_1 + \beta_2$	-0.3709***	-0.1474***	-0.1308	-0.0405
	(0.1251)	(0.0466)	(0.1954)	(0.1503)
Observations	51,193	51,193	24,474	24,474
R^2	0.90641	0.90640	0.94518	0.94517
Within R^2	0.00411	0.00402	0.00264	0.00234

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Panel C. Primary school

Dependent Variable:	Working in the wearing apparel sector			
Measure of province-level tariff (k):	1	2	1	2
$Tariff_{pt}^{k}$	-0.1495	-0.0508***	-0.3249	-0.1675
	(0.0972)	(0.0156)	(0.5371)	(0.1125)
× Female	-0.0642***	-0.0445***	0.0216	0.0312
	(0.0177)	(0.0098)	(0.0915)	(0.0654)
$\beta_1 + \beta_2$	-0.2135**	-0.0952***	-0.3033	-0.1364**
	(0.1003)	(0.0164)	(0.4566)	(0.0542)
Observations	51,159	51,159	24,707	24,707
R^2	0.95998	0.96001	0.96782	0.96796
Within R^2	0.00230	0.00323	0.00348	0.00797

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Note: Column 1 and 2 are results from the panel component of VHLSS 2002 and 2004. Column 3 and 4 are results from the panel component of VHLSS 2002 and 2006. All specifications include individual and year fixed effects. Standard errors are clustered at the province level.

Table 14: Results for the TWFE model on the effect of the BTA on working in the in the traded-manufacturing sector.

Dependent Variable:	Working in the traded-manufacturing sector			
Model:	(1)	(2)	(3)	(4)
$Tariff_{pt}^{k}$	0.0233	0.0375	0.1254	0.0889
	(0.1474)	(0.0300)	(0.3757)	(0.0805)
× Female	-0.0118	-0.0010	0.1684	0.1079
	(0.0454)	(0.0281)	(0.1275)	(0.0858)
$\beta_1 + \beta_2$	0.0115	0.0366	0.2938	0.1968**
	(0.1663)	(0.0454)	(0.4477)	(0.0842)
Observations	76,762	76,762	35,215	35,215
R^2	0.80025	0.80026	0.81433	0.81443
Within R^2	6.22×10^{-6}	5.16×10^{-5}	0.00077	0.00134

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Note: Column 1 and 2 are results from the panel component of VHLSS 2002 and 2004. Column 3 and 4 are results from the panel component of VHLSS 2002 and 2006. All specifications include individual and year fixed effects. Standard errors are clustered at the province level.

Table 15: Results for the TWFE model on the effect of the BTA on working in the manufacturing sector.

Dependent Variable:	Working in the manufacturing sector			
Model:	(1)	(2)	(3)	(4)
$Tariff_{pt}^{k}$	0.0385	0.0393	0.1442	0.0964
	(0.1475)	(0.0317)	(0.3821)	(0.0797)
× Female	-0.0171	-0.0043	0.1589	0.1020
	(0.0449)	(0.0279)	(0.1241)	(0.0834)
$\beta_1 + \beta_2$	0.0210	0.0348	0.2999	0.1962**
	(0.1652)	(0.0468)	(0.4519)	(0.0848)
Observations	76,757	76,757	35,212	35,212
R^2	0.80044	0.80045	0.81490	0.81501
Within R^2	9.34×10^{-6}	4.98×10^{-5}	0.00061	0.00118

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Note: Column 1 and 2 are results from the panel component of VHLSS 2002 and 2004. Column 3 and 4 are results from the panel component of VHLSS 2002 and 2006. All specifications include individual and year fixed effects. Standard errors are clustered at the province level.

Table 16: Results for the TWFE model on the effect of the BTA on working in the construction sector.

Dependent variable:	Working in the construction sector			
Measure of province-level tariff (k):	1	2	1	2
$Tariff_{pt}^{k}$	-0.0447	0.0426	-0.1552	-0.0486
	(0.2351)	(0.0789)	(0.2633)	(0.0964)
× Female	0.1305***	0.0877*	0.1789*	0.1274
	(0.0443)	(0.0440)	(0.0901)	(0.0805)
$\beta_1 + \beta_2$	0.0859	0.1303***	0.0237	0.0787
	(0.2046)	(0.0451)	(0.2305)	(0.0684)
Observations	68,607	68,607	31,086	31,086
R^2	0.80589	0.80590	0.80852	0.80849

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Note: Column 1 and 2 are results from the panel component of VHLSS 2002 and 2004. Column 3 and 4 are results from the panel component of VHLSS 2002 and 2006. All specifications include individual and year fixed effects. Standard errors are clustered at the province level.

Figure 11: Change in province-level tariff versus change in aggregate province-level wages for male and female workers between 2001 and 2005

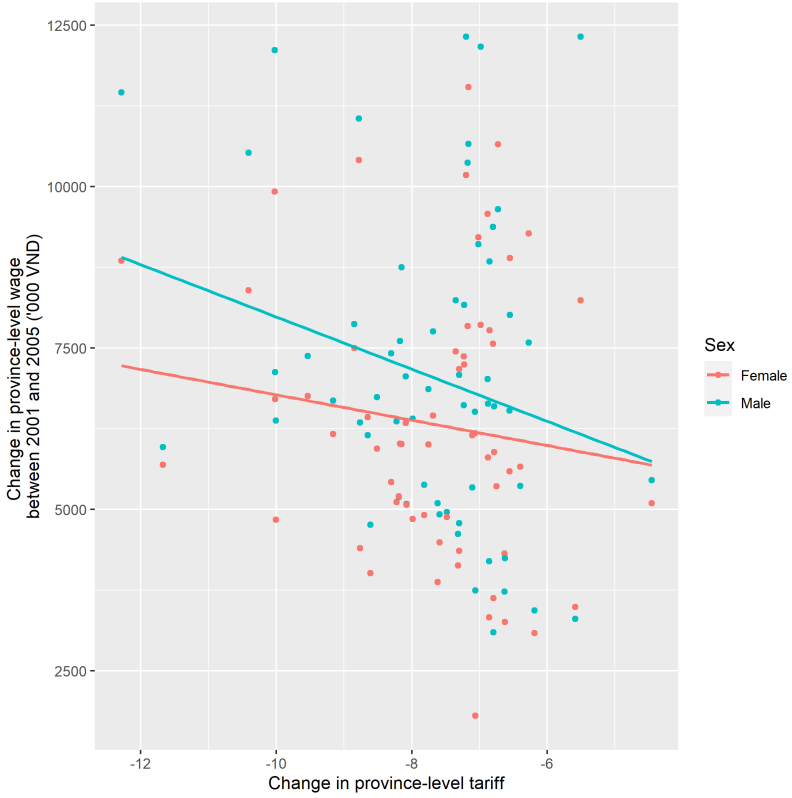
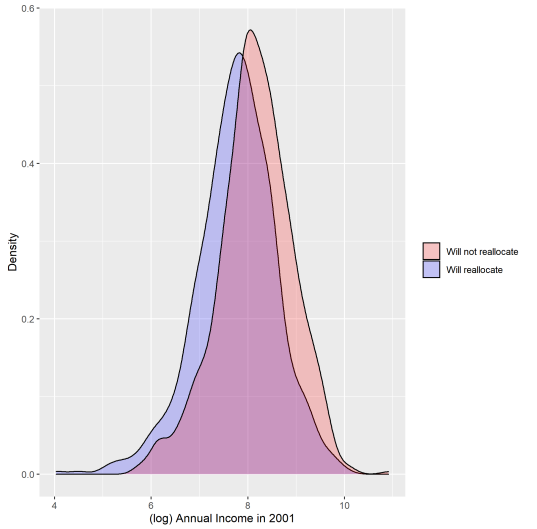


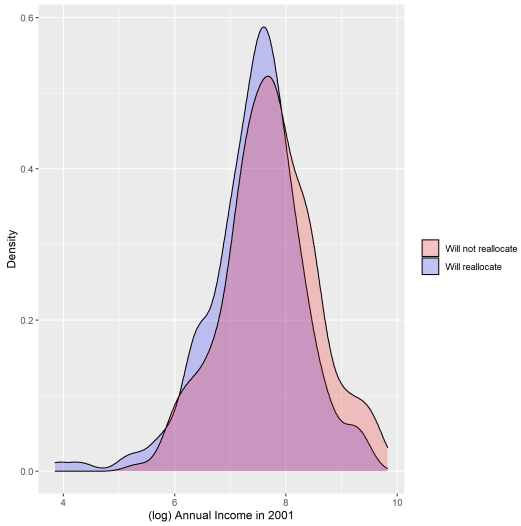
Table 17: Aggregate wages of the agricultural and wearing leather apparel sector in 2001 and 2005.

	Agriculture		Wearing Apparel and Leather	
	Male	Female	Male	Female
2001				
('000) VND	3084.45	2118	9397	7609
2005				
('000) VND	8281	6435	14585	11448

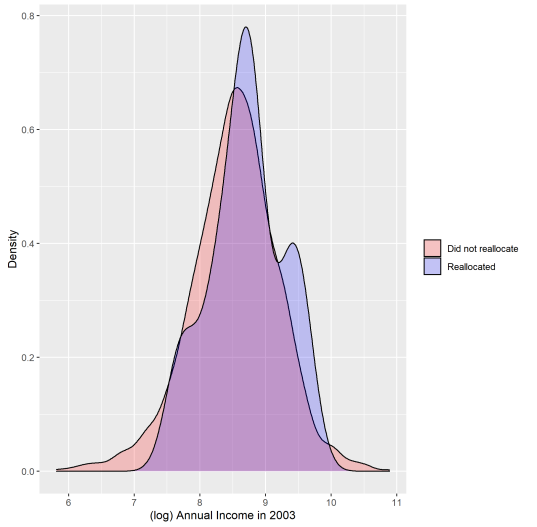
Figure 12: 2001 and 2005 kernal density estimates of the (log) wages of male and female workers who did and did not reallocate into the wearing apparel sector



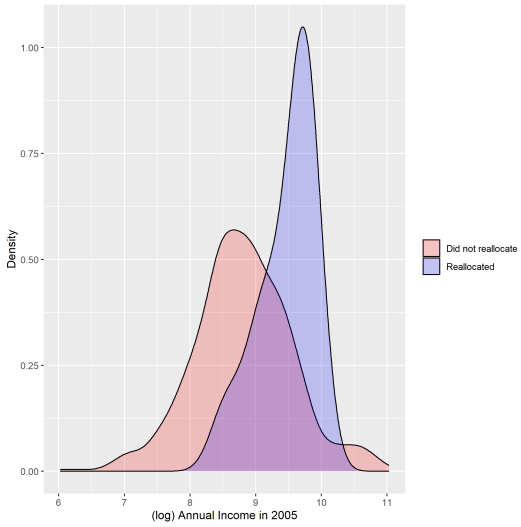
(a) Male



(b) Female



(c) Male



(d) Female

Table 18: Results for the TWFE model on the effect of the BTA on women's relative wages, by urban.

Panel A. Rural workers

Dependent Variable:	Women's contribution towards total household income (%)			
Measure of province-level tariff (k):	1	2	1	2
$Tariff_{pt}^{k}$	-1.362***	-0.6233***	-1.019*	-0.3451*
	(0.4647)	(0.1216)	(0.5190)	(0.2062)
Observations	8,443	8,443	3,290	3,290
R^2	0.68708	0.68803	0.83786	0.83790
Within R^2	0.00278	0.00582	0.00267	0.00288

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Panel B. Urban workers

Dependent Variable:	Women's contribution towards total household income (%)			
Measure of province-level tariff (k):	1	2	1	2
$Tariff_{pt}^{k}$	0.4798**	0.1501**	-0.7033	-0.2081*
	(0.1992)	(0.0628)	(0.4531)	(0.1190)
Observations	4,230	4,230	2,083	2,083
R^2	0.80034	0.80043	0.77117	0.77125
Within R^2	0.00204	0.00252	0.00296	0.00333

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Note: Column 1 and 2 are results from the panel component of VHLSS 2002 and 2004. Column 3 and 4 are results from the panel component of VHLSS 2002 and 2006. All specifications include household and year fixed effects. Standard errors are clustered at the province-level.

Table 19: Results for the TWFE model on the effect of the BTA on women's relative wages, by education level.

Panel A. High school or above

Dependent Variable:	Women's contribution towards total household income (%)			
Measure of province-level tariff (k):	1	2	1	2
$Tariff_{pt}^{k}$	0.2366	0.0296	-1.732***	-0.5173***
	(0.2389)	(0.0974)	(0.4380)	(0.0978)
Observations	5,253	5,253	2,258	2,258
R^2	0.79895	0.79891	0.89603	0.89636
Within R^2	0.00025	5×10^{-5}	0.02115	0.02431

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Panel B. Secondary school

Dependent Variable:	Women's contribution towards total household income (%)			
Measure of province-level tariff (k):	1	2	1	2
$Tariff_{pt}^{k}$	1.088***	0.2626***	-0.9306	-0.3672
	(0.3568)	(0.0893)	(1.069)	(0.2593)
Observations	4,839	4,839	2,055	2,055
R^2	0.84315	0.84303	0.94146	0.94159
Within R^2	0.00270	0.00192	0.00269	0.00498

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Panel C. Primary school

Dependent Variable:	Women's contribution towards total household income (%)			
Measure of province-level tariff (k):	1	2	1	2
$Tariff_{pt}^{k}$	0.0877	0.0916	-0.1939	-0.0565
	(0.4700)	(0.1146)	(0.5471)	(0.1618)
Observations	5,474	5,474	2,364	2,364
R^2	0.84679	0.84682	0.93709	0.93709
Within R^2	1.93×10^{-5}	0.00023	0.00016	0.00015

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Note: Column 1 and 2 are results from the panel component of VHLSS 2002 and 2004. Column 3 and 4 are results from the panel component of VHLSS 2002 and 2006. All specifications include household and year fixed effects. Standard errors are clustered at the province level.

Table 20: Results for the TWFE model on the effect of the BTA on real monetary household expenditure on various public goods.

Panel A. 2001 - 2003

(log) Real monetary expenditure on:	Food		Education		Health	
Measure of province-level tariff (k):	1	2	1	2	1	2
$Tariff_{pt}^{k}$	-0.3663	-0.4970	2.451	0.8965	-5.206	-2.172***
	(0.7715)	(0.4026)	(3.309)	(0.8661)	(4.057)	(0.7562)
Observations	14,399	14,399	10,172	10,172	14,142	14,142
R^2	0.96601	0.96606	0.97184	0.97185	0.94806	0.94812
Within R^2	8.48×10^{-5}	0.00146	0.00084	0.00100	0.00182	0.00290

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Panel B. 2001 - 2005

(log) Real monetary expenditure on:	Food		Education		Health	
Measure of province-level tariff (k):	1	2	1	2	1	2
$Tariff_{pt}^{k}$	3.906	1.506	0.8006	1.427	5.819	3.565**
	(3.832)	(0.9947)	(2.933)	(1.289)	(9.073)	(1.582)
Observations	7,129	7,129	4,986	4,986	6,966	6,966
R^2	0.95997	0.96019	0.97459	0.97469	0.93303	0.93343
Within R^2	0.00885	0.01415	0.00013	0.00427	0.00202	0.00789

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Note: All specifications include household and year fixed effects, and standard errors are clustered at the province-level.

Table 21: Results for the TWFE model on the effect of the BTA on school enrollment.

Dependent Variable:	Enrolled at school			
Measure of province-level tariff (k):	1	2	1	2
$Tariff_{pt}^{k}$	0.2166	0.0438	-0.1477	0.0097
	(0.2260)	(0.0561)	(0.6955)	(0.1720)
× Daughter	0.0521	0.0290	-0.2718	-0.1556
	(0.0654)	(0.0442)	(0.2298)	(0.1585)
$\phi_1 + \phi_2$	0.2687	0.0728	-0.4195	-0.1460
	(0.2121)	(0.0450)	(0.6758)	(0.1721)
Observations	47,605	47,605	19,363	19,363
R^2	0.82415	0.82414	0.79179	0.79174
Within R^2	0.00013	8.15×10^{-5}	0.00077	0.00057

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Note: Column 1 and 2 are results from the panel component of VHLSS 2002 and 2004. Column 3 and 4 are from the panel component of VHLSS 2002 and 2006. All specifications include household and year fixed effects, and standard errors are clustered at the province-level.

Table 22: Results for the TWFE model on the effect of the BTA on real monetary household expenditure on tobacco.

(log) Real monetary expenditure on:	Tobacco			
Measure of province-level tariff (k):	1	2	1	2
$Tariff_{pt}^{k}$	-1.220	-1.261	-1.943	-1.085
	(4.403)	(2.438)	(4.154)	(0.8873)
Observations	12,139	12,139	6,049	6,049
R^2	0.96021	0.96025	0.95236	0.95238
Within R^2	9.64×10^{-5}	0.00022	0.00074	

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Note: Column 1 and 2 are results from the panel component of VHLSS 2002 and 2004. Column 3 and 4 are from the panel component of VHLSS 2002 and 2006. All specifications include household and year fixed effects, and standard errors are clustered at the province-level.

Table 23: Share of people who were divorced in Vietnam between 2001 and 2005.

	Divorced (%)
2001	0.57
2005	0.81

Source: Author's calculations using VHLSS 2002 and 2006.

Table 24: Results for the TWFE model on the effect of the BTA on divorce.

Dependent Variable:	Divorced			
Measure of province-level tariff (k):	(1)	(2)	(3)	(4)
$Tariff_{pt}^{k}$	-0.0337	-0.0150**	-0.0028	-0.0016
	(0.0382)	(0.0064)	(0.0389)	(0.0127)
Observations	132,356	132,356	55,623	55,623
R^2	0.80553	0.80554	0.76648	0.76648
Within R^2	4.92×10^{-5}	0.00010	2.65×10^{-7}	8.61×10^{-7}

*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Note: Column 1 and 2 are results from the panel component of VHLSS 2002 and 2004. Column 3 and 4 are from the panel component of VHLSS 2002 and 2006. All specifications include household and year fixed effects, and standard errors are clustered at the province-level.