

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 uses the US-Vietnam Bilateral Trade Agreement (BTA) that came into force in 2001 to explore how the disproportionate expansion of female-intensive sectors can trigger the structural transformation of the female labour force, and how this affects women's share of contribution to the total household income. By using a panel households from the Vietnam Household Living Standards Survey and through exploiting provincial variation in exposure to the BTA, I find that women increased their contribution to the total household income by 10.8 percentage points 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, and find that household consumption of 'female-preferred' goods did not increase. An explanation for why women's intrahousehold bargaining position did not improve is that since divorce is not widely practiced in Vietnam, and since exposure to the BTA did not lead to a change in norms surrounding divorce, women's threat option did not become more credible in circumstances of noncooperative bargaining between spouses.

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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 outside option (i.e. the availability and quality of jobs for women) and relative income are 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 intrahousehold bargaining has been linked to intergenerational benefits ([Duflo and Udry, 2004](#); [Majlesi, 2016](#); [Almås et al., 2018](#); [Armand et al., 2020](#)).

This paper uses the US-Vietnam Bilateral Trade Agreement (BTA) which came into effect in 2001 to study how the trade-induced disproportionate expansion of the female-intensive wearing apparel and leather sector led to the structural transformation of the female labour force, and its effect on women’s relative income at the household-level. This paper also explores whether the trade-induced improvement in women’s

outside option improved their intrahousehold bargaining position. 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, particularly 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. The wearing apparel sector is preceded by footwear (leather) sector in terms of commodity export value in 2006, and which enjoyed a 20.84 percentage point tariff reduction under the BTA. Since over 70 percent of those working in the wearing apparel and leather sector were women in 2001, the subsequent rapid expansion of these female-intensive sectors due to the BTA is expected to have triggered structural transformation of the female labour force, and to have improved the relative wages and labour market opportunities for women. 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 expansion of the wearing apparel and leather sector under 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, 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 from husband 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. This question is pertinent since models of intrahousehold 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 felt as though divorce was not an option, the improvement in relative wages and labour market opportunities is not expected to result in higher intrahousehold bargaining power for women since these factors would not influence the credibility of her threat of divorce.

It is also conceivable that women may be prevented being empowered at the household level due to male backlash. If male workers 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 labour market outcomes, and this effect would be especially pronounced in contexts where women feel obliged to remain in the same household as their husbands.

This paper uses a difference-in-differences approach which relies on the construction of an index of province-level exposure to the BTA akin to Kovak (2013) and Topalova (2010). Using nationally representative panel data from the Vietnam Household Living Standards Survey, I leverage provincial exposure to the BTA to first assess whether in provinces that were more exposed to the BTA, women were more likely than men to reallocate into the wearing apparel and leather sector. I then turn to look at whether among provinces that were more exposed to the BTA, women’s relative income increased such that the spousal contribution gap to the total household income was smaller than in households in less exposed provinces. Finally, I examine if, as predicted by the intrahousehold bargaining literature, the narrowing of spousal contribution gap increased household consumption of goods that would be indicative of stronger female intrahousehold bargaining power.

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 goods which reflect ‘female preferences’ 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, and where the spousal contribution gap is expected to be smaller.

I find that although women were more likely to reallocate into the wearing apparel and leather sector than men in more liberalised areas in the 4 years following the implementation of the BTA, and that in these regions women were able to considerably close the spousal contribution gap, this did not translate into higher intrahousehold bargaining power for women. 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.

¹Field 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.

An explanation posited for why an improvement in the relative wage and labour market opportunities for Vietnamese women did not result in higher intrahousehold bargaining power is that the aforementioned factors serve to increase the credibility of women's threat of divorce, and absent the ability to practically carry through with the threat, an increase in relative wages and labour market opportunities do not change women's intrahousehold bargaining position. Additionally, while it has not been established what the minimum extent or threshold for women's contribution to the household income must be before it is manifested in how household resources are allocated, a 10.7 percentage point increase in women's contribution to the total household income may be insufficient to change intrahousehold bargaining dynamics.

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 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 the spousal contribution gap yet an unanswered question, and one which this paper aims to answer.

Within the field of the intersection of trade and gender is a strand of research which examines whether trade imparts onto women non-market benefits, and which this paper also speaks to. [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 Mexico. 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 examines whether access to foreign export markets empower women at the household even in contexts where divorce is not widely practiced.

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, unlike the free trade agreements leveraged by the aforementioned papers, 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 with an average tariff reduction of 20 percentage points across all industries. The manufacturing sector benefited 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 (2013, 2018) find that workers in provinces more exposed to the BTA were more likely to move into the manufacturing sector and reallocate into formal jobs.

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

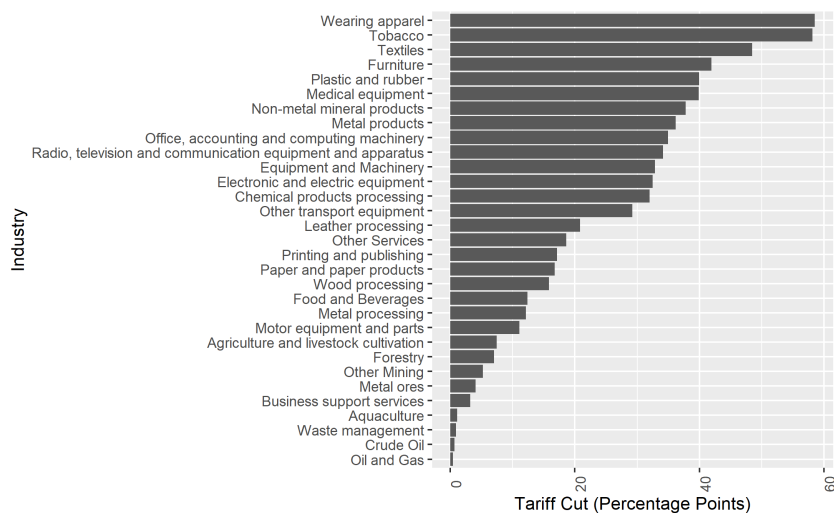


Table 2: Main commodity exports from Vietnam to the US between 1998 and 2006

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

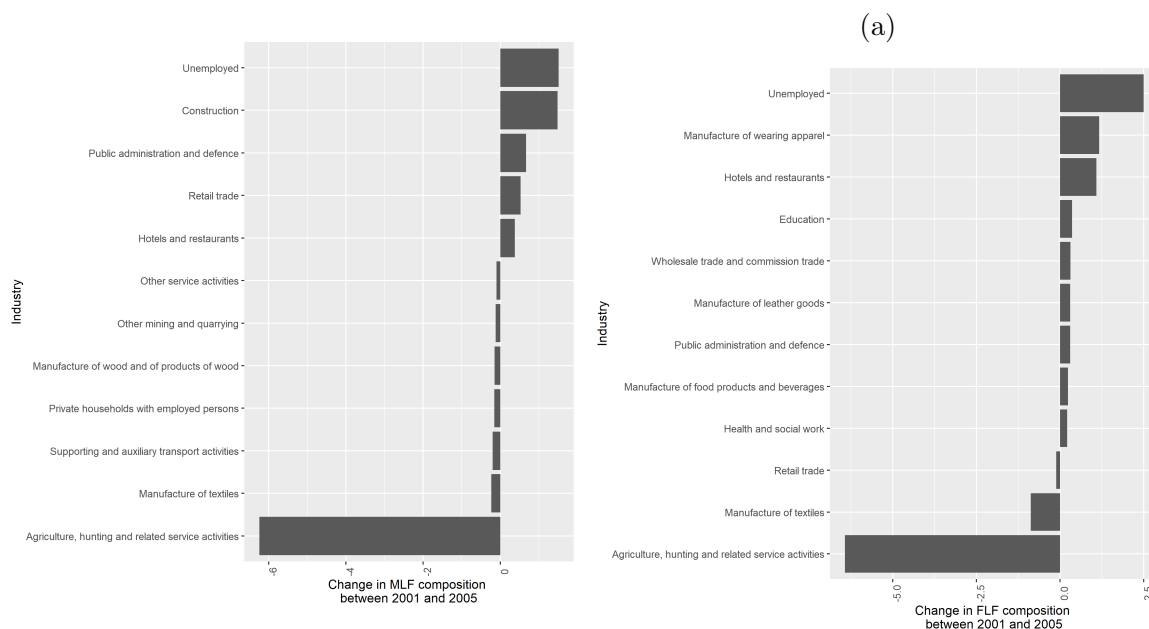
Source: Author's calculations from data downloaded from the U.S. International Trade Commission's website.

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 3, 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 3, 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 18 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.

Figure 3



As female workers reallocated into the traded sectors that grew the most 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 \(2014\)](#), it is expected for the spousal contribution gap to have narrowed as women (rather than men) occupied the jobs created as a result of the BTA. The descriptive statistics found in [Table 20](#) confirm the view that among workers who remained in the agricultural sector and workers who reallocated into the wearing apparel and leather sector, women who reallocated into the wearing apparel and leather sector were the group which increased their wages the most. Given that women in the wearing apparel and leather sector contribute more to the household income than women in the agricultural sector, as can be seen in [Table 3](#), it is worthy to further examine whether the BTA-induced closing of the spousal contribution gap translated into higher intrahousehold bargaining power.

Table 3: Share of total household income contributed by women in the agricultural and wearing apparel and leather sector in 2001 and 2005.

	Agriculture	Wearing apparel and leather
2001	26.78%	36.41%
2005	27.30%	41.19%

Source: Author’s calculations from panel component of VHLSS data.

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. I use the VHLSS conducted in 2001, representing households in the pre-BTA period, and the VHLSS conducted in 2003 and 2005, representing households in the post-BTA period. The panel component for VHLSS 2001 and 2003 will be used to assess the short-term impact of the BTA whereas the panel component for VHLSS 2001 and 2005 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 2001 and 2005, I also only retain observations who were between the age of 18 and 65 in 2001. 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 spouses negotiate with each other, independently of other family members.

The VHLSS contains 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.

4 Structural Transformation

A difference-in-differences strategy that relies on provincial heterogeneity in exposure to the BTA will be employed to study the impact of access to US markets on the structural transformation of the Vietnamese labour force and its gender-specific effects.

4.1 Province-level tariffs

To measure provincial exposure to the BTA, I construct an index of province-level tariffs analogous to [Topalova \(2010\)](#) and [Kovak \(2013\)](#). The purpose of calculating the province-level tariff is to capture the extent to which workers in the province were able to access jobs within the wearing apparel and leather sector due to the increased demand for Vietnamese exports. 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 weight (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:

$$(3) \quad \omega_{jp}^2 = \frac{L_{jp}}{L_p^2}$$

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.

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 and leather sector, I employ the following linear probability model (LPM):

$$(4) \quad Reallocated_{it} = \beta_1 Tariff_{pt}^k + \beta_2 Tariff_{pt}^k * Female_i + \alpha_i + \theta_t + \epsilon_{ipt}$$

where $Reallocated_{it}$ is an indicator variable which takes the value of 1 if worker i at year t works in either the wearing apparel or leather 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 women's exit from agriculture than men. Standard errors are clustered at the province-level.

Crucial to note is that since the parameters in equation (4) estimate the one-unit increase in $Tariff_{pt}^k$ on the probability of working in the apparel and leather 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 apparel and leather sector.

4.2.1 Spousal contribution gap

I then turn to look at the effect of the BTA-induced structural transformation on the spousal contribution gap with the following two-way fixed effects (TWFE) model:

$$(5) \quad ShareInc_{it} = \pi Tariff_{pt}^k + \alpha_i + \theta_t + \epsilon_{ipt}$$

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 (4).

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 and leather sector are reported in Table 4. In all specifications, the coefficients associated with female workers' probability of working in the wearing apparel and leather 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 reallocating female workers into this sector than male workers. The coefficients in column 3, which is the marginal effect of $Tariff_{pt}^1$, show that the average province-level tariff reduction of 7.69 percentage points correspond with an increase in the number of female workers within the wearing apparel and leather sector by 2.74 percentage points and male workers by 2.41 percentage points between 2001 and 2005. 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 significant employing the panel element of VHLSS 2001 and 2005.

Table 4: Results for the TWFE model on the effect of the BTA on labour reallocation into the wearing apparel and leather.

Dependent Variable:	Working in wearing apparel and leather sector			
Measure of province-level tariff (k):	1	2	1	2
$Tariff_{pt}^k$	-0.2620*** (0.0954)	-0.0617*** (0.0219)	-0.3135*** (0.1080)	-0.0782** (0.0362)
$Tariff_{pt}^k \times Female$	-0.1069*** (0.0148)	-0.0639*** (0.0095)	-0.0432 (0.0384)	-0.0198 (0.0265)
$\beta_1 + \beta_2$	-0.3689*** (0.0728)	-0.1256*** (0.0202)	-0.3566*** (0.1129)	-0.0980** (0.0384)
Observations	76,762	76,762	35,215	35,215
R ²	0.79558	0.79556	0.84398	0.84389
Within R ²	0.00253	0.00240	0.00220	0.00165

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

Note: Column 1 and 2 are results from the panel component of VHLSS 2001 and 2003.

Column 3 and 4 are results from the panel component of VHLSS 2001 and 2005. 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 found in Table 5 show that rural workers were more affected by the BTA than urban workers. Across all specifications, the coefficients associated with 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 and leather sector contributed to trade-induced poverty reduction.

Table 5: Results for the TWFE model on the effect of the BTA on labour reallocation into the wearing apparel and leather, by urban.

Panel A. Rural workers

Dependent Variable:	Working in wearing apparel and leather sector			
Measure of province-level tariff (k):	1	2	1	2
$Tariff_{pt}^k$	-0.3859** (0.1692)	-0.1454** (0.0640)	-0.4004 (0.3381)	-0.1145 (0.1492)
$Tariff_{pt}^k \times Female$	-0.1257*** (0.0246)	-0.0918*** (0.0191)	-0.0788* (0.0454)	-0.0541* (0.0312)
$\beta_1 + \beta_2$	-0.5116*** (0.1812)	-0.2372*** (0.0771)	-0.4792 (0.3587)	-0.1687 (0.1565)
Observations	67,251	67,251	31,280	31,280
R ²	0.85522	0.85532	0.90484	0.90477
Within R ²	0.00418	0.00486	0.00415	0.00341

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

Panel B. Urban workers

Dependent Variable:	Working in wearing apparel and leather sector			
Measure of province-level tariff (k):	1	2	1	2
$Tariff_{pt}^k$	-0.1586** (0.0741)	-0.0393* (0.0235)	-0.2252*** (0.0545)	-0.0662*** (0.0153)
$Tariff_{pt}^k \times Female$	-0.0690** (0.0264)	-0.0322** (0.0235)	0.0312 (0.0322)	0.0206 (0.0135)
$\beta_1 + \beta_2$	-0.2276*** (0.0635)	-0.0716*** (0.0154)	-0.1940*** (0.0491)	-0.0456** (0.0173)
Observations	47,518	47,518	22,856	22,856
R ²	0.90322	0.90321	0.92125	0.92124
Within R ²	0.00094	0.00091	0.00076	0.00073

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

Note: Column 1 and 2 are results from the panel component of VHLSS 2001 and 2003. Column 3 and 4 are results from the panel component of VHLSS 2001 and 2005. All specifications include individual and year fixed effects. Standard errors are clustered at the province level.

Additionally, since jobs within the wearing apparel and leather sector are predominantly low-skilled, it is worthy of further examination the effect of a positive and exogenous trade shock on workers of different education levels. Thus, I implement equation (4) 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 Table 6 show that while female workers with a secondary school education were the most likely to work in the wearing apparel and leather 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. Interestingly, none of the coefficients associated with the full marginal effect of $Tarif_{pt}^k$ are positive and would suggest that workers of all education levels and of both sexes were more likely to work in the wearing apparel and leather sector as a result of the BTA.

Table 6: Results for the TWFE model on the effect of the BTA on labour reallocation into the wearing apparel and leather, by level of education.

Panel A. High school of above

Dependent Variable:	Working in wearing apparel and leather sector			
Measure of province-level tariff (k):	1	2	1	2
$Tariff_{pt}^k$	-0.2336*** (0.0534)	-0.0477* (0.0246)	-0.4237*** (0.0764)	-0.0953*** (0.0275)
$Tariff_{pt}^k \times Female$	-0.0836* (0.0473)	-0.0316 (0.0284)	-0.0577 (0.0814)	0.0061 (0.0268)
$\beta_1 + \beta_2$	-0.3172*** (0.0508)	-0.0794*** (0.0198)	-0.4365*** (0.0814)	-0.0893*** (0.0197)
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 wearing apparel and leather sector			
Measure of province-level tariff (k):	1	2	1	2
$Tariff_{pt}^k$	-0.3532** (0.1410)	-0.0876 (0.0561)	-0.2630 (0.2475)	-0.0337 (0.1401)
$Tariff_{pt}^k \times Female$	-0.1544*** (0.0279)	-0.0985*** (0.0185)	-0.1013 (0.0960)	-0.0774 (0.0681)
$\beta_1 + \beta_2$	-0.5076*** (0.1407)	-0.1861*** (0.0513)	-0.3643 (0.3088)	-0.1111 (0.1841)
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 wearing apparel and leather sector			
Measure of province-level tariff (k):	1	2	1	2
$Tariff_{pt}^k$	-0.1728* (0.1024)	-0.0387* (0.0204)	-0.3247 (0.4229)	-0.1446 (0.1037)
$Tariff_{pt}^k \times Female$	-0.1004** (0.0399)	-0.0759*** (0.0249)	0.0060 (0.1254)	0.0256 (0.0956)
$\beta_1 + \beta_2$	-0.2732** (0.1066)	-0.1146*** (0.0186)	-0.3187 (0.3349)	-0.1190*** (0.0416)
Observations	51,159	51,159	24,707	24,707
R ²	0.95593	0.95597	0.96948	0.96953
Within R ²	0.00300	0.00392	0.00276	0.00456

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

Note: Column 1 and 2 are results from the panel component of VHLSS 2001 and 2003. Column 3 and 4 are results from the panel component of VHLSS 2001 and 2005. All specifications include individual and year fixed effects. Standard errors are clustered at the province level.

4.3.2 Spousal contribution gap

The results for the parameters in equation (5), which estimates the effect of the BTA on women's ability increase her contribution towards the total household income, is given in Table 7. Comparing the coefficients derived from the panel element of VHLSS 2001/2003 to those of VHLSS 2001/2005, 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.

Table 7: Results for the TWFE model on the effect of the BTA on wages of female workers as a share of her total household income.

Dependent Variable: Measure of province-level tariff (k):	Women's contribution towards total household income (%)			
	1	2	1	2
$Tariff_{pt}^k$	0.4385** (0.2111)	0.0834 (0.0821)	-1.407*** (0.3807)	-0.4466*** (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

Note: Column 1 and 2 are results from the panel component of VHLSS 2001 and 2003. Column 3 and 4 are results from the panel component of VHLSS 2001 and 2005. 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 the structural transformation of the female labour force. To further understand whether the reallocation of female rural women into the wearing apparel and leather 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 (5). While the result in Table 7 indicate that, on aggregate, the BTA did not affect women's wages until 4 years after the implementation of the BTA, Panel A of Table 8 shows that the BTA allowed rural women to close the spousal contribution gap as soon as 2003. Additionally, consistent with the findings in Table 5 and McCaig (2011), the benefits of the BTA-induced structural transformation are concentrated among rural workers. Specifically, between 2001 and 2005 rural women closed the spousal contribution gap by 3.21 to 7.82 percentage points, while urban women closed the spousal contribution gap by 1.93 to 5.4 percentage points.

Table 8: Results for the TWFE model on the effect of the BTA on wages of female workers as a share of her total household income, 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*** (0.4647)	-0.6233*** (0.1216)	-1.019* (0.5190)	-0.3451* (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** (0.1992)	0.1501** (0.0628)	-0.7033 (0.4531)	-0.2081* (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 2001 and 2003. Column 3 and 4 are results from the panel component of VHLSS 2001 and 2005. All specifications include household and year fixed effects. Standard errors are clustered at the province-level.

With regards to how the effects of the BTA on the spousal contribution gap differed by the wife's education level, the results in Table 9 show that there is little heterogeneity.

Between 2001 and 2003, Vietnam's access to the US export market had no effect on women's relative income for those with a high school or above, or primary school education. On the other hand, column 3 and 4 of Table 9 indicate that women who had a secondary school education residing in provinces that were more exposed to the BTA experienced a decline in their relative wages compared to women in less exposed provinces. As for the effect of the BTA on the spousal contribution gap between 2001 and 2005, only the coefficients associated with the relative wage of wives with a high school education or above are statistically significant.

Table 9: Results for the TWFE model on the effect of the BTA on wages of female workers as a share of her total household income.

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
$Tariff_{\mu}^k$	0.2366 (0.2389)	0.0296 (0.0974)	-1.732*** (0.4380)	-0.5173*** (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
$Tariff_{\mu}^k$	1.088*** (0.3568)	0.2626*** (0.0893)	-0.9306 (1.069)	-0.3672 (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
$Tariff_{\mu}^k$	0.0877 (0.4700)	0.0916 (0.1146)	-0.1939 (0.5471)	-0.0565 (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 2001 and 2003. Column 3 and 4 are results from the panel component of VHLSS 2001 and 2005. All specifications include household and year fixed effects. Standard errors are clustered at the province level.

5 Intrahousehold Bargaining

Having established that households in more liberalised provinces experienced a reduction in the spousal contribution gap, I turn to look at whether households in more

liberalised provinces consumed more of goods and services which have been shown by extant studies 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:

$$(6) \quad Share_{ht}^g = \gamma Tariff_{pt}^k + \delta_h + \theta_t + \epsilon_{hpt}$$

where $Share_{ht}^g$ 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 (5).

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:

$$(7) \quad Investment_{it} = \phi_1 Tariff_{pt}^k + \phi_2 Tariff_{pt}^k * Daughter_i + \delta_h + \theta_t + \epsilon_{hpt}$$

where $Investment_{it}$ 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 $Tariff_{pt}^k * Daughter_i$ allows for the determi-

nation of whether households in more provinces more exposed to the BTA increased investment into daughters' education relative to sons.

5.1 Results

Tables 10 and 12 provide the results for the effect of exposure to the BTA on the share of household expenditure spent on various public goods and tobacco respectively. Contrary to Armand et al. (2020), the positive coefficients displayed in columns 1 and 2 of both panels of Table 10 indicate that households located in more liberalised provinces (and therefore, in provinces where women are arguably more empowered) 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 in more liberalised areas 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 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 wage entails 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. This would ultimately suggest that the closing of the spousal contribution gap in more liberalised provinces had a negligible effect on investment into education. Finally, columns 5 and 6 of both panels of Table 10 also indicate that the share of household expenditure on health decreased, although this effect is both economically and statistically insignificant.

Table 10: 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** (0.3661)	0.1327 (0.0952)	0.0135 (0.1244)	0.0284 (0.0473)	0.0745 (0.2955)	0.0158 (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** (0.4494)	0.2394 (0.1514)	-0.0776 (0.1956)	0.0010 (0.0603)	-0.0341 (0.3927)	0.1034* (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.

What could explain these unexpected results? One way to explain 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 (6) with the (log) real monetary value of household expenditure on the same household goods. The results can be viewed in Table 21 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 2001 and 2003 are negative, the coefficients using VHLSS 2001 and 2005 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 21 indicate that households in more liberalised provinces 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.

Table 11 presents the parameters given by equation (7), 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 $Tarif f_{pt}^k \times Daughter_i$ 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 11: Results for the TWFE model on the effect of the BTA on expenditure on education.

Dependent Variable:	(log) real expenditure on education			
Measure of province-level tariff (k):	(1)	(2)	(3)	(4)
$Tariff_{pt}^k$	2.528 (0.3148)	1.376*** (0.3436)	2.040 (3.022)	1.346** (0.6114)
$Tariff_{pt}^k \times \text{Daughter}$	0.1756 (0.3148)	0.1759 (0.2094)	-0.0861 (0.4802)	0.0423 (0.3212)
$\phi_1 + \phi_2$	2.705 (2.270)	1.553*** (0.3939)	1.959 (3.073)	1.391* (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 2001 and 2003. Column 3 and 4 are from the panel component of VHLSS 2001 and 2005. All specifications include household and year fixed effects, and standard errors are clustered at the provincelevel.

While the previous results detail that the closing of the spousal contribution gap did not lead to greater investment in ‘female-preferred’ household public goods nor daughters’ education, Table 12 and Table 23 show that household expenditure on tobacco increased more, both as a share of total household expenditure and in real monetary value, in provinces that were more liberalised. More specifically, the coefficients 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, as are the coefficients for the share of total household expenditure on tobacco using $Tariff_{pt}^1$ as a measure of province-level tariff. Thus, even though the BTA did not lead to the increase of households public goods that could indicate that women increased her intrahousehold bargaining power, it did not lead to higher consumption of ‘male-preferred’ private goods that could indicate

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

Table 12: 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 2001 and 2003. Columns 3 and 4 from the panel component of VHLSS 2001 and 2005. All specifications include household and year fixed effects, and standard errors are clustered at the province level.

6 Values and Norms

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 cultural norms.

To evaluate the extent to which cultural norms surrounding divorce shifted as Vietnam underwent structural transformation, I rely 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 cultural norms of divorce in Vietnam before and after the implementation of the BTA.

Column 2 of Table [13](#) 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 [13](#).

Table 13: Descriptive statistics on norms and values on divorce in Vietnam between 2001 and 2005.

Panel A. All observations

	Never justifiable (%) ^{1.}	Mean ^{2.}	S.D. ^{3.}
2001	51.60	2.56	0.07
2005	54.72	2.33	0.05

Panel B. Female

	Never justifiable (%) ^{4.}	Mean ^{2.}	S.D. ^{3.}
2001	53.1	2.55	0.09
2005	55.1	2.36	0.08

Panel C. Male

	Never justifiable (%) ^{5.}	Mean ^{2.}	S.D. ^{3.}
2001	49.1	2.71	0.09
2005	55	2.32	0.07

1. Share of respondents answering that divorce is ‘never justifiable’.
2. Mean score of question on justifiableness of divorce.
3. Standard deviation of question on justifiableness of divorce.
4. Share of female respondents answering that divorce is ‘never justifiable’.
5. Share of male respondents answering that divorce is ‘never justifiable’.

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

Taken together, the descriptive statistics in Table 13 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 cultural norms and values. In other words, a plausible reason for why women’s intrahousehold bargaining position did not improve despite the BTA-induced increase in wives’ relative wages and improvement in 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.

To empirically test whether in provinces that were more exposed to the BTA, divorce was more normalised, I employ Wave 4 and Wave 5 of the WVS and implement the following TWFE model:

$$(8) \quad \textit{NeverJustifiable}_{it} = \textit{Tariff}_{pt}^k + \mathbf{X}_{it} + \gamma_p + \theta_t + \epsilon_{ipt}$$

where $\textit{NeverJustifiable}_{it}$ is an dummy variable which takes the value of 1 if the respondent answers that divorce is ‘never justifiable’ and 0 otherwise. \textit{Tariff}_{pt}^k is the province-level tariff as calculated by equation (1). \mathbf{X}_{it} is a vector of individual-level control variables including age and its square, occupation, gender, education level, and urban. Time (θ_t) and province (γ_p) fixed effects are included, and standard errors are clustered at the province-level (ϵ_{ipt}).

The results in Table 14 provide evidence that the BTA had no effect on shifting norms and values regarding divorce in Vietnam as even though the coefficients are negative and large, they are also statistically insignificant. Thus, the results in Table 14 lend credence to the explanation that without the practical possibility of divorce, women are hindered from allocating household resources in a way that would better reflect her preferences since regardless of the outcome of negotiations with her husband, women are bound to remaining married. Indeed, Table 25 in the Appendix confirms the hypothesis that the BTA-induced structural transformation did not lead to greater divorce; only in the specification employing \textit{Tariff}_{pt}^2 on the panel element of VHLSS

2001 to 2003 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.

Table 14: Results for the TWFE model on the effect of the BTA on perception of divorce.

Dependent Variable:	Divorce is justifiable	
Measure of province-level tariff (k):	1	2
$Tariff_{pt}^k$	-6.581 (6.297)	-0.4610 (1.659)
Observations	5,558	5,558
R ²	0.09050	0.09017
Within R ²	0.03625	0.03590

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

Note: All specifications include province and year fixed effects, and standard errors are clustered at the province level. Controls include gender, age and its square, education, profession, and urban.

7 Conclusion

In this paper, I provide evidence that the expansion of female-intensive sectors due to access to US export markets under the BTA led to the structural transformation of the

Vietnamese female labour force. Specifically, the female-intensive wearing apparel and leather sector grew the most in terms of export value between 2001 and 2005, and was also the sectors which had the highest value of exports in 2005. I find that the BTA led to an increased probability of working for the wearing apparel and leather sector by approximately 3 percentage points for women, but less for men.

Additionally, the BTA-induced structural transformation in such a way that allowed women to close the spousal contribution gap such that women's contribution to the total household income increased by 10.8 percentage points. However, contrary to what has been predicted by models of non-cooperative intrahousehold bargaining, the narrowing of the gender wage gap at the household-level did not lead to an increase in household expenditure on goods considered to be aligned with female preferences. This may be due to the fact that the values and norms which prevented women from being empowered at the household level did not shift as women reallocated into higher paying sectors, and demonstrates the fact that the closing of the spousal contribution gap is an important but not sufficient condition for women to improve their intrahousehold bargaining position.

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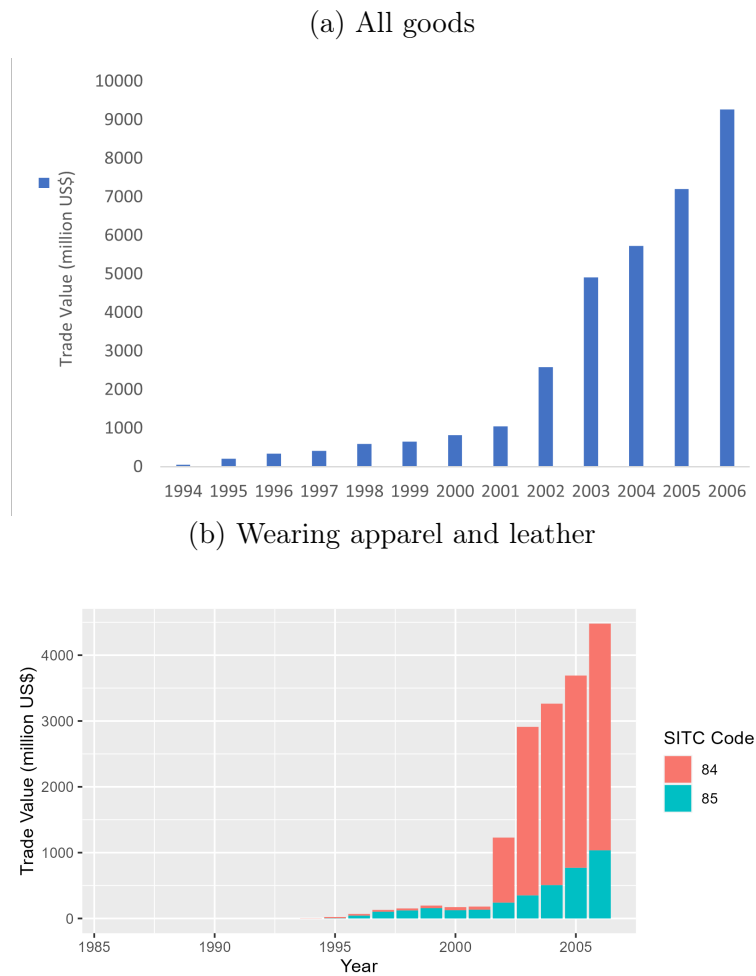
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A Appendix

Figure 4: Value of exports of all Vietnamese goods to the US between 1994 and 2006



Source: Author's calculations from COMTRADE data.

Table 15: 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 16: 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 5: 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

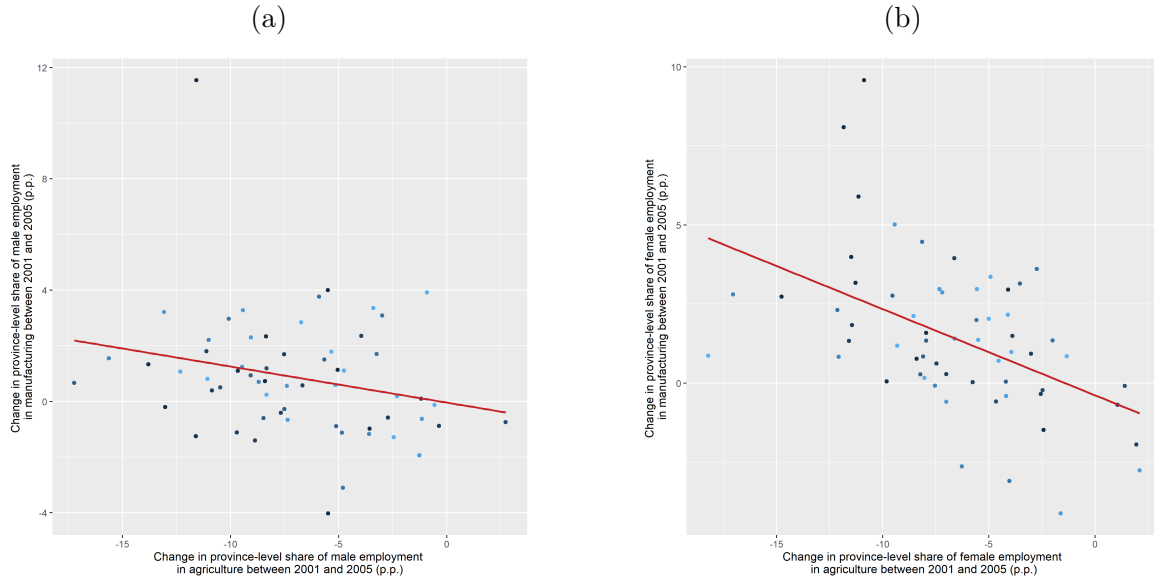


Figure 6: Change in province-level tariff versus change in province-level share of male and female employment in the agricultural sector between 2001 and 2005

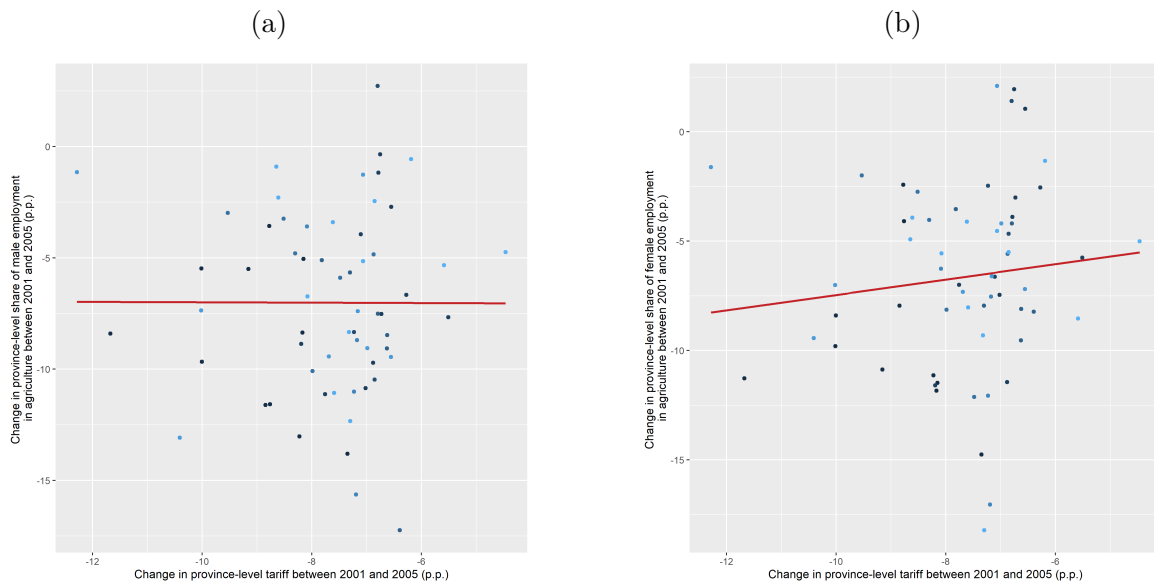


Figure 7: Change in province-level tariff versus change in province-level share of male and female employment in the wearing apparel and leather sector between 2001 and 2005

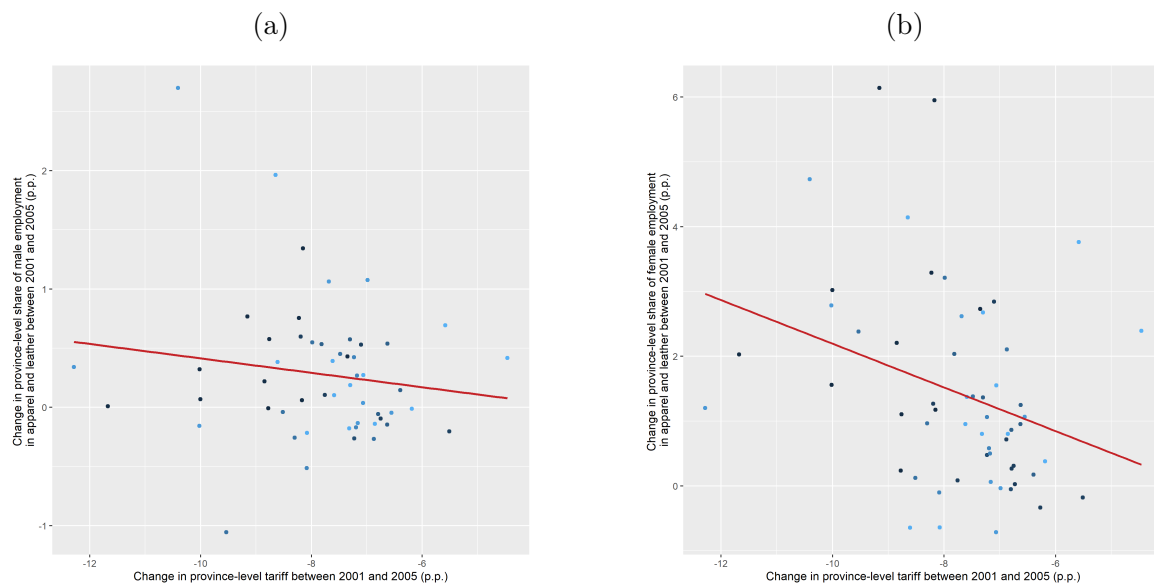
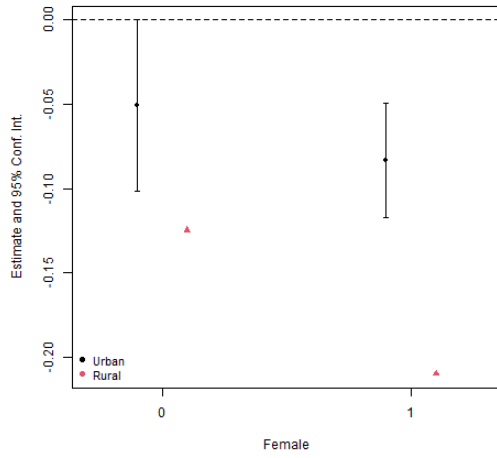
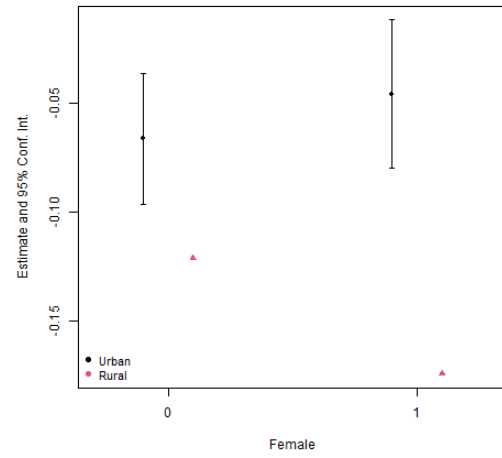


Figure 8: Effect of the BTA on reallocation of agricultural workers into the wearing apparel and leather sector, by urban



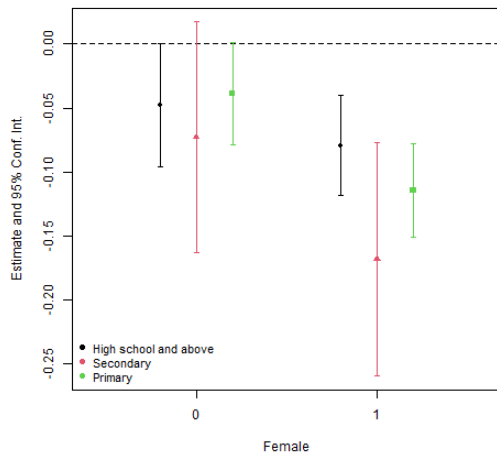
(a) 2001 - 2003



(b) 2001 - 2005

Figure 9: Effect of the BTA on reallocation of workers into the wearing apparel and leather sector, by educational attainment

(a) 2001 - 2003



(b) 2001 - 2005

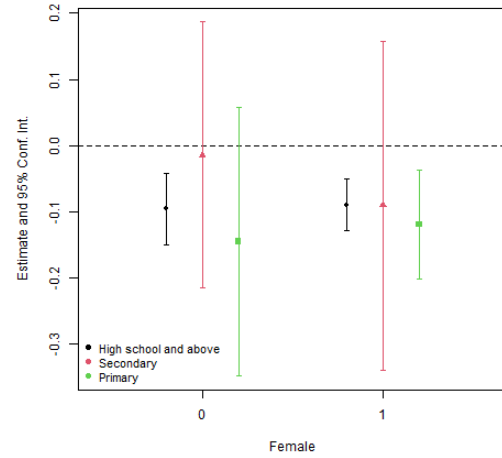
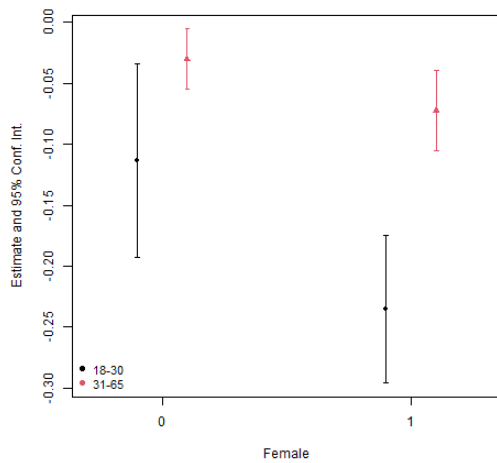


Figure 10: Effect of the BTA on reallocation of workers into the wearing apparel and leather sector, by age group

(a) 2001 - 2003



(b) 2001 - 2005

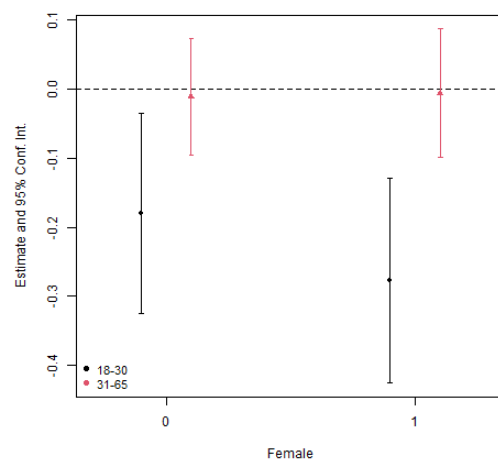


Table 17: Results for the TWFE model on the effect of the BTA on labour reallocation into the traded-manufacturing sector.

Dependent Variable:	Working in the traded-manufacturing sector			
Model:	(1)	(2)	(3)	(4)
$Tariff_{pt}^k$	0.0233 (0.1474)	0.0375 (0.0300)	0.1254 (0.3757)	0.0889 (0.0805)
$Tariff_{pt}^k \times \text{Female}$	-0.0118 (0.0454)	-0.0010 (0.0281)	0.1684 (0.1275)	0.1079 (0.0858)
$\beta_1 + \beta_2$	0.0115 (0.1663)	0.0366 (0.0454)	0.2938 (0.4477)	0.1968** (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 2001 and 2003. Column 3 and 4 are results from the panel component of VHLSS 2001 and 2005. All specifications include individual and year fixed effects. Standard errors are clustered at the province level.

Table 18: Results for the TWFE model on the effect of the BTA on labour reallocation into 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 (0.2351)	0.0426 (0.0789)	-0.1552 (0.2633)	-0.0486 (0.0964)
$Tariff_{pt}^k \times \text{Female}$	0.1305*** (0.0443)	0.0877* (0.0440)	0.1789* (0.0901)	0.1274 (0.0805)
$\beta_1 + \beta_2$	0.0859 (0.2046)	0.1303*** (0.0451)	0.0237 (0.2305)	0.0787 (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 2001 and 2003. Column 3 and 4 are results from the panel component of VHLSS 2001 and 2005. 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

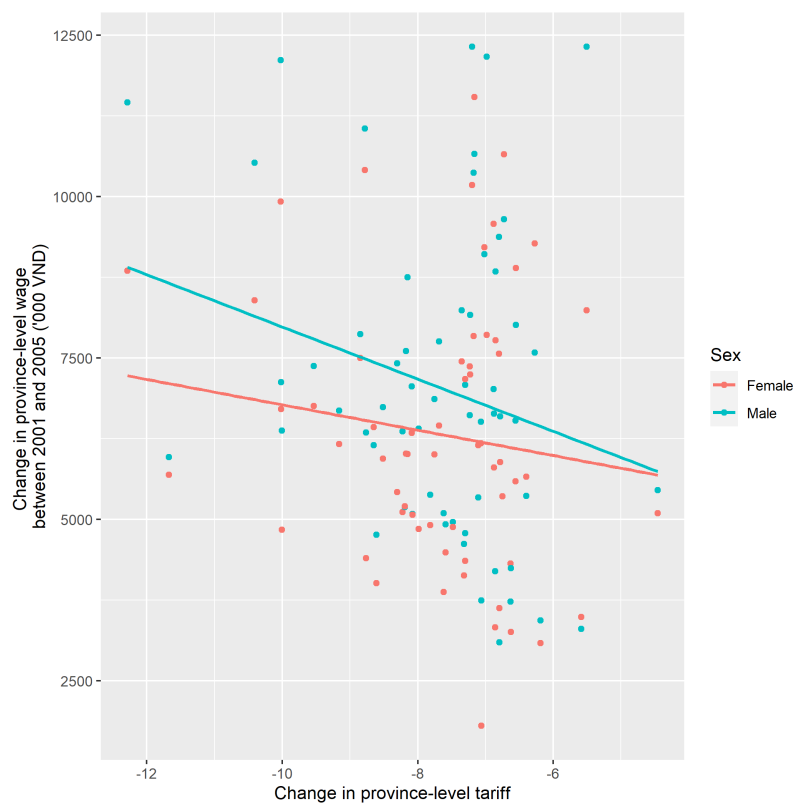


Table 19: Aggregate wages of the agricultural and wearing leather apparel sector in 2001 and 2005.

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

Table 20: Wages of men and women who did and did not reallocate into the wearing apparel and leather 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 data.

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

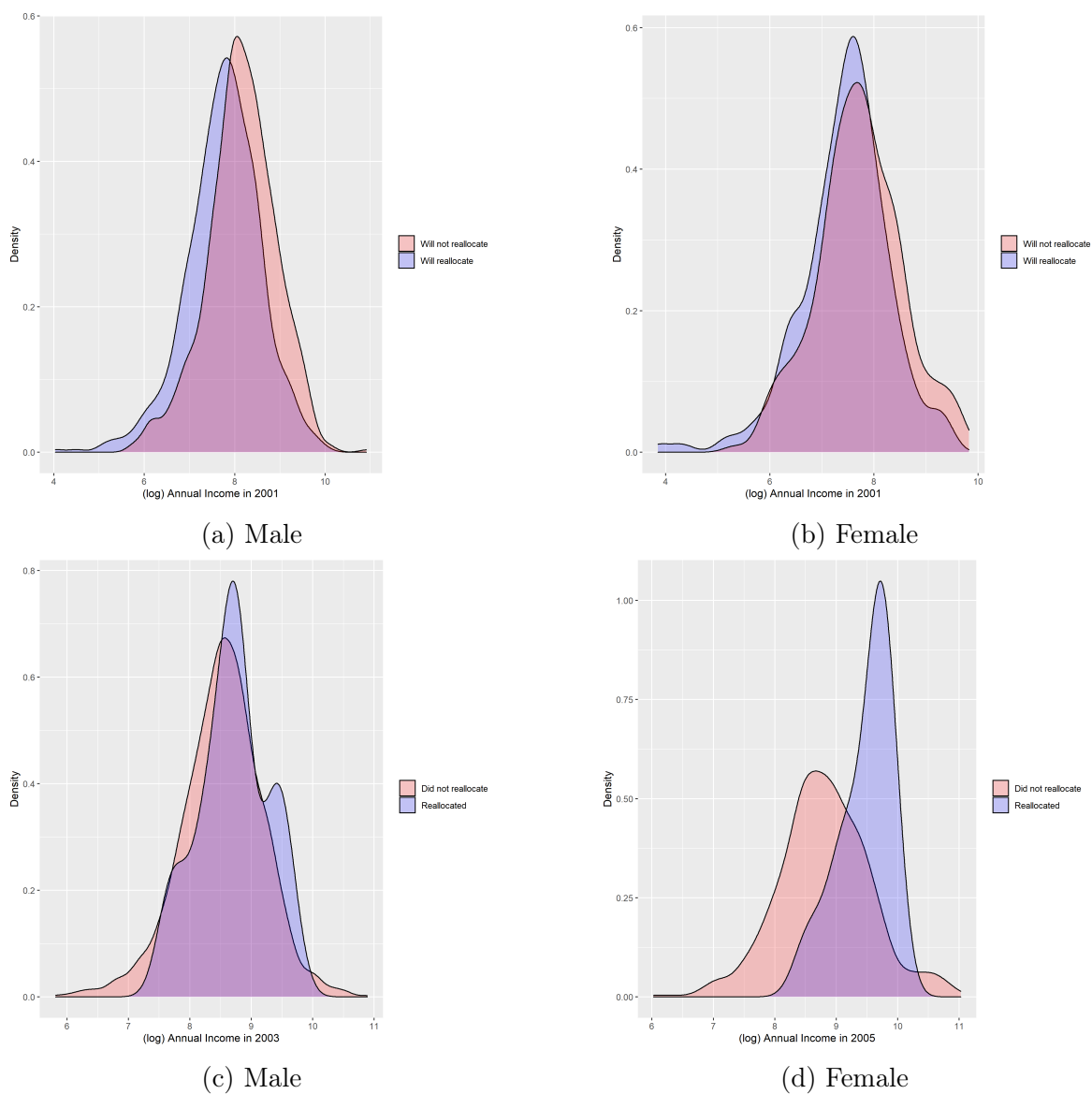


Figure 13: 2001 and 2005 kernel density estimates of the (log) wages of female workers in the agricultural and wearing apparel and leather sector as a share of total household income who did and did not reallocate into the wearing apparel and leather sector

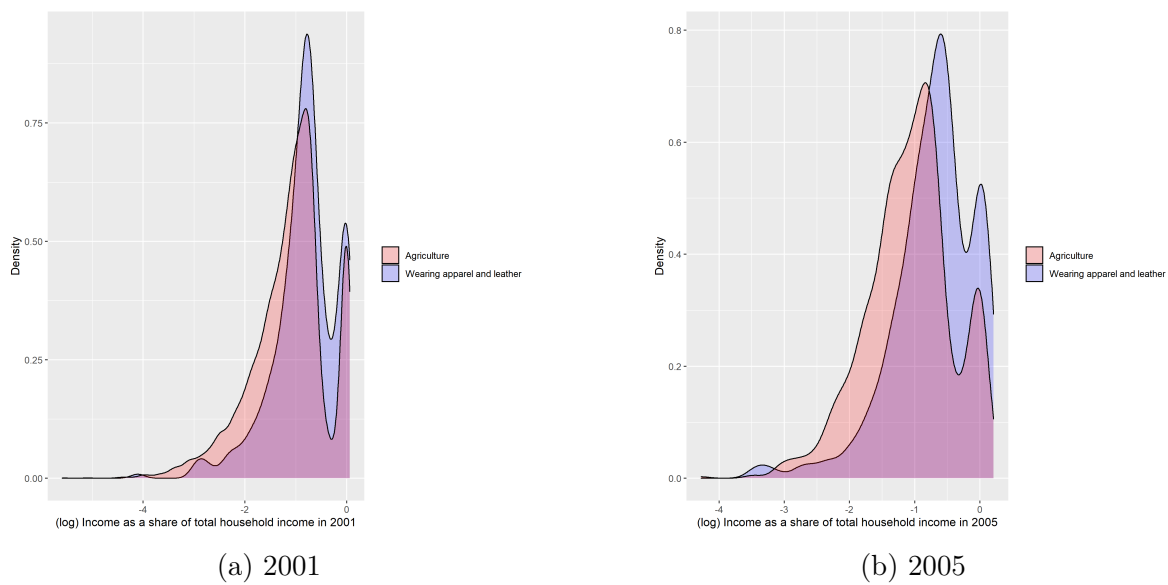


Figure 14: Effect of the BTA on the spousal contribution gap, by urban

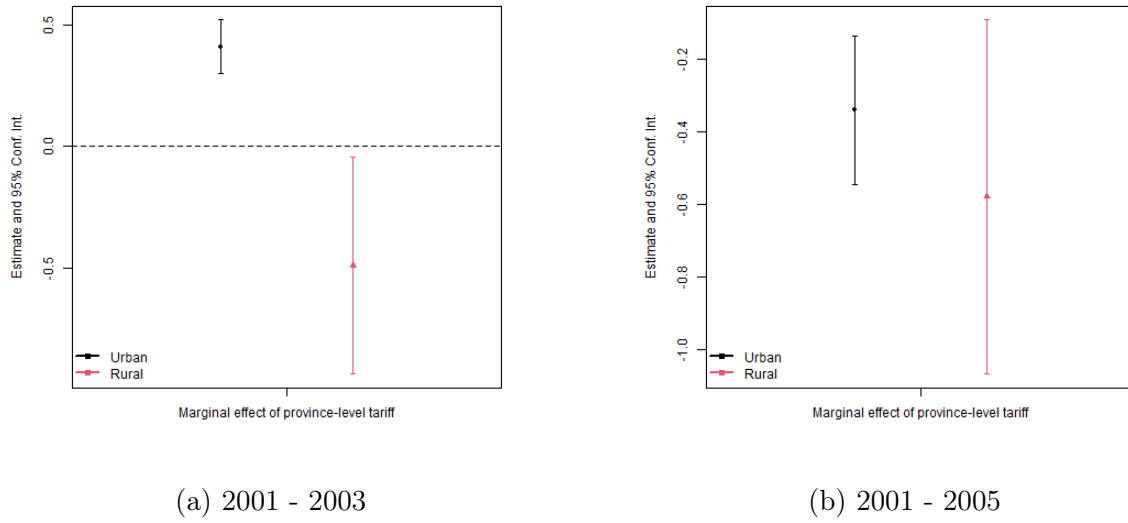


Figure 15: Effect of the BTA on the spousal contribution gap, by education

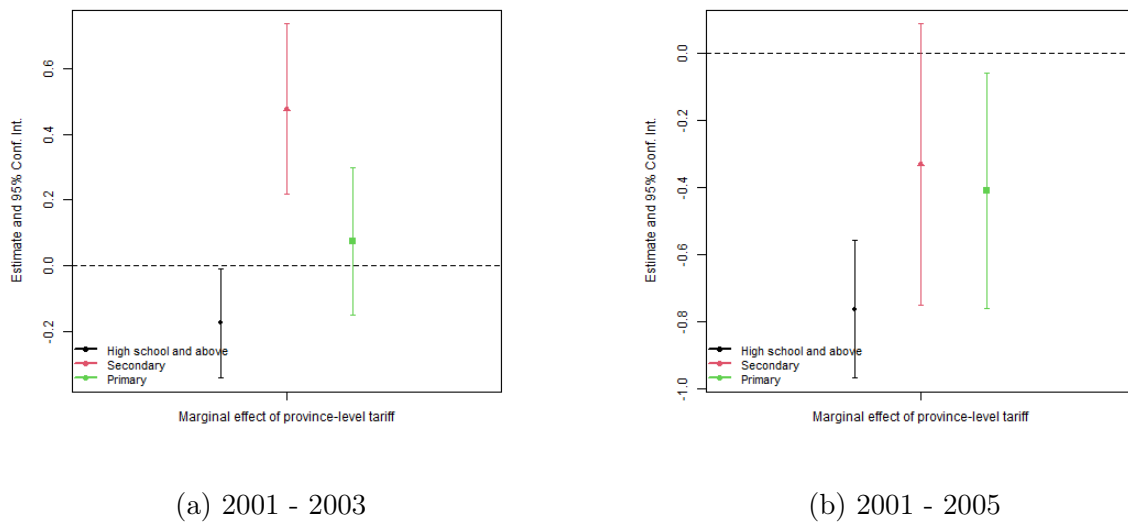
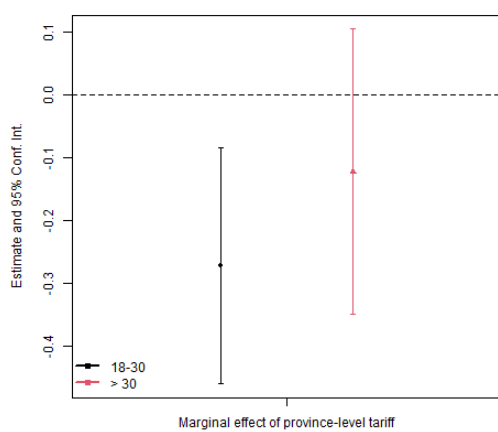
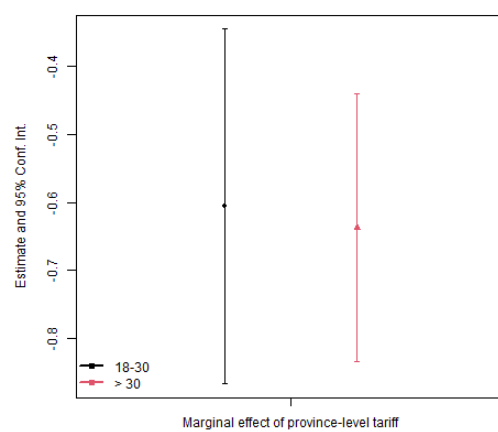


Figure 16: Effect of the BTA on the spousal contribution gap, by age



(a) 2001 - 2003



(b) 2001 - 2005

Table 21: 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 (0.7715)	-0.4970 (0.4026)	2.451 (3.309)	0.8965 (0.8661)	-5.206 (4.057)	-2.172*** (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 (3.832)	1.506 (0.9947)	0.8006 (2.933)	1.427 (1.289)	5.819 (9.073)	3.565** (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 22: 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 (0.2260)	0.0438 (0.0561)	-0.1477 (0.6955)	0.0097 (0.1720)
$Tariff_{pt}^k \times \text{Daughter}$	0.0521 (0.0654)	0.0290 (0.0442)	-0.2718 (0.2298)	-0.1556 (0.1585)
$\beta_1 + \beta_2$	0.2687 (0.2121)	0.0728 (0.0450)	-0.4195 (0.6758)	-0.1460 (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 2001 and 2003. Column 3 and 4 are from the panel component of VHLSS 2001 and 2005. All specifications include household and year fixed effects, and standard errors are clustered at the province-level.

Table 23: 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 (4.403)	-1.261 (2.438)	-1.943 (4.154)	-1.085 (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: All specifications include household and year fixed effects, and standard errors are clustered at the province-level.

Table 24: 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 2001 and 2005.

Table 25: 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 (0.0382)	-0.0150** (0.0064)	-0.0028 (0.0389)	-0.0016 (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 2001 and 2003. Column 3 and 4 are from the panel component of VHLSS 2001 and 2005. All specifications include household and year fixed effects, and standard errors are clustered at the province-level.