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ABSTRACT

We examine how export expansion induced by the U.S-Vietnam Bilateral Trade Agreement (BTA) affected migration, school enrollment, work and healthcare use of young children and adolescents in Vietnam. To do so, we exploit variation in tariff reductions across industries associated with the BTA and differences in industry employment shares across Vietnamese provinces prior to the policy change. We find that the BTA led to migration to the most affected provinces, particularly by adolescents (15 to 18) and young adults (19 to 29). The BTA also increased household expenditures, slightly decreased employment among nonmigrant adults and increased employment among migrant adults. Among adolescents, enrolment increased among non-migrants, but fell among migrants, with the opposite pattern for working. For children (7 to 14), enrolment did not change among non-migrants, but fell for migrants, who typically moved with their family. Conditional on being enrolled, education expenditures increased for both children and adolescents. We find evidence that healthcare utilization decreased for both children and adolescents.

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1. Introduction

Trade liberalization and the resulting expansion of exports have been an important source of economic growth for developing countries. Establishing free trade zones and entering into trade agreements that reduce tariffs and other trade barriers have helped developing countries gain access to new markets for goods and services. Notably, average tariffs on imports from developing countries have fallen from over 30 percent to roughly 13 percent, which has increased developing countries' share of global trade from 29 to 37 percent in the past several decades (Mattoo, 2016; Cordoba, 2016).

A large body of literature has studied the effects of trade liberalization on developing countries, but most of it has focused on how tariff reductions affect labor markets, returns to skills, income inequality, and poverty.[2] Trade liberalization, however, may also have effects in other domains, including human capital investment in children and adolescents. Given the centrality of human capital to economic growth and the relatively low stock of human capital in developing countries, determining the effect of expanded trade on human capital development is significant in terms of policy and theory.

Few studies have examined the impacts of trade liberalization on children's human capital. Edmonds, Pavcnik and Topalova (2010) reported that import tariff reductions in India lowered school enrollment and increased unpaid work (girls only) among rural children ages 10 to 14 in the areas that had a high concentration of affected industries.[3] Kis-Katos and Sparrow (2011) found that reduced import tariffs in Indonesia led to a decrease in employment among children ages 10 to 15 years old, especially among those from low-educated backgrounds and in rural areas. In both contexts, the effect of liberalization on income was an important mechanism. Atkin (2016) found that Mexico's export expansion in the years 1986 to 2000 raised wages for low-skilled labor, which increased the opportunity cost of schooling, and induced 16-year-olds to drop out of school and enter employment. A similar finding is reported in Li (2018) who found that educational attainment is positively correlated with export demand shocks in industries that required high-skilled labor and negatively correlated with export demand shocks in industries that required low-skilled labor.[4]

As this brief review highlights, results from the few studies of the effect of trade policy on children's human capital development are somewhat mixed. Because studies of the domestic effects of changes in international trade are necessarily country-specific, and therefore, context-specific (Pavcnik, 2017), broader lessons of the effect of trade policy on children's human capital can only come from

[2] See a recent review by Pavcnik (2017) and the studies cited therein.
[3] Edmonds, Pavcnik, and Topalova (2009) find a decrease in school attendance and an increase in the prevalence of work among children in urban India.
[4] Blanchard and Olney (2017) provide cross-country evidence that the composition of a country's exports influences educational outcomes. Edmonds and Pavcnik (2005) find that rising prices for rice, an important export crop, in Vietnam in the 1990s are associated with a decrease in child labor.

additional country-specific study and syntheses based on such a body of evidence. We are the first paper to study the effects of a policy-driven, positive export demand shock on children's human capital accumulation.[5] We do so in the context of a low-income country, Vietnam, which has a high rate of literacy and a rapidly growing manufacturing sector.

In this article, we investigate the effect of the US-Vietnam Bilateral Trade agreement (BTA) on children's and adolescent's education, employment, migration, and health in Vietnam. The BTA came into effect in December 2001 and caused an immediate and large reduction in U.S. tariffs on goods imported from Vietnam. Prior to the agreement, Vietnamese exports were subject to the US Column 2 tariffs, which apply to only a few countries with whom the United States does not have "Normal Trade Relations", such as Cuba and North Korea. The BTA moved tariffs on imports from Vietnam from Column 2 to tariff rates for countries that are in the Most Favored Nation (MFN) group. This led to large declines in tariffs applied to products from Vietnam. Tariffs declined from an average of 30% prior to the BTA to approximately 3% afterward (McCaig, 2011; McCaig and Pavcnik, 2018). As a result, the value of exports from Vietnam to the U.S. surged 15-fold between 2000 and 2008. Just two years after the BTA came into effect, the United States went from one of Vietnam's smallest export destinations to its single largest export market and it has remained in this position since then (Martin, 2016). Importantly, the reduction in tariffs resulted from differences between two pre-existing tariff schedules, providing a natural experiment that is unlikely to have been influenced by either U.S. or Vietnamese industries and is, therefore, plausibly exogenous.

The motivation for our study of the effects of the BTA on children's human capital stems from the likely effects of the BTA on household income and family labor supply. As we noted earlier, exports from Vietnam to the US increased markedly after the BTA and likely caused firms to expand production, particularly in the formal sector (McCaig, Pavcnik, and Wong, 2020). The resulting expanded employment opportunities likely increased family income and may have made households more likely to invest in their children's human capital. For example, the greater income of parents may cause them to invest more in children to raise child quality (normal good) by sending children to school instead of having them work, by providing children with better nutrition, or by investing in children's health through greater use of medical services. On the other hand, a greater demand, and higher wages, for labor may induce older children (adolescents) to work and families to encourage children to work instead of school, or to substitute for parents in the informal sector who have left that sector for the formal sector. It may also cause parents to substitute market work for non-market and informal work that is used in productive child rearing activities, which may harm child development. Therefore, the net effect of trade liberalization on children's human capital is ambiguous.

[5] Atkin (2016) studies the effects of new jobs in export-oriented manufacturing in Mexico and Li (2018) examines the effects of rising exports in China. Neither export shock is driven by a specific change in trade policy.

Expanded labor market opportunities resulting from the BTA may also affect locational choices and internal migration. People and families may move from provinces less affected by the BTA to provinces more affected, although migration is relatively low in Vietnam (Coxhead et al. 2019). Migration may have equilibrating effects through changes in labor supply across provinces over time, and selection effects if migrants and non-migrants differ (Borjas 2001). A novel contribution of our study is the examination of migration in response to the BTA and the assessment of how migration affects estimates of the effect of the BTA on children's outcomes.

Our empirical analysis is based on a difference-in-differences research design that exploits province-specific differences in tariff reductions caused by provincial differences in employment structure prior to the BTA (Topalova 2007; McCaig 2011). We construct a measure of treatment intensity using the industry-specific employment-weighted tariff cut in each province. We merge the extent of treatment by province with survey information about children and families from the Vietnam Household Living Standards Surveys (VHLSS) from 2002, 2004, 2006, and 2008. We also use the 1999 and 2009 Censuses and a similar approach to examine the effect of the BTA on work, school enrollment, and migration over a longer period.

An important finding of our analysis is that the BTA increased inter-provincial migration, particularly among (unaccompanied) adolescents ages 15 to 18 and young adults ages 19 to 29. A one standard deviation in tariff reductions was associated with an increase in population of approximately 10 percent for adolescents ages 15 to 18 and 12 percent for young adults ages 19 to 29. The entirety of this increase is likely due to migration because deaths are negligible at these ages and the BTA could not affect births of the population 10 and older during the period of analysis. The migration in response to the BTA was non-random; older teen migrants were more likely to work, particularly in the formal sector, and less likely to be enrolled in school than their non-migrant counterparts; and young adult migrants were less likely to work, than their non-migrant counterparts.

In terms of mechanisms linking the BTA to child outcomes, our results indicate that a one standard deviation in tariff reductions caused by the BTA was associated with an increase of approximately three to four percent in household expenditures by 2008 (six years after implementation of BTA). The increase in household expenditures is consistent with the increase in employment in the formal sector among adults we observe. A one standard deviation reduction in tariffs was associated with a small (e.g., 10%), positive increase in the probability of working in the formal sector among non-migrants. These changes suggest that the BTA raised household income and slightly increased labor supply among adults in these households.

With respect to the effect of the BTA on children and adolescents, we find that the BTA had, on average, small to no effect on school enrollment. However, there was significant heterogeneity by migrant status. Estimates from the analyses that use census data, which report migrant status, indicate that among

non-migrants ages 15 to 18, enrollment increased by two percent. In contrast, among migrants, the BTA is associated with a three to five percentage point decrease in enrollment among those ages 10 to 18 with the relative effect being larger (6% to 10%) for adolescents ages 15 to 18. We do not find similar evidence of an enrollment effect from analyses that use the VHLSS, but the VHLSS largely exclude migrants and estimates using these data reflect effects mostly (not exclusively) for non-migrants. Therefore, the heterogeneous effects of the BTA between migrants and non-migrants suggest that estimates of the effect of the BTA on school enrollment obtained using the VHLSS surveys may be downward biased. Migrant children are less likely to be enrolled and more likely to work, so migration out of less affected provinces would raise the enrollment rate in those provinces relative to more affected provinces and would tend to bias estimates obtained using the VHLSS downward to be more negative than otherwise. This is what we observe.

While the BTA had little effect on the extensive margin of school enrollment, tariff reductions were associated with significant increases in expenditures on school conditional on attending school. By 2008, a one standard deviation reduction in tariffs was associated with a 5 percent to 12 percent increase in school expenditures among children with the larger estimates found for children ages 15 to 18.

Consistent with the enrollment estimates, we find that, on average, the BTA had relatively little effect on work of children. In this case too, however, we see significant heterogeneity of effects between migrants and non-migrants. Among migrants, tariff reductions are associated with a significant increase in work, including work in the formal sector, by 2009. We see less evidence of an effect of the BTA on work among adolescents using the VHLSS survey data, but we note, again, that these data largely exclude migrants who are a selected group. Migration out of less affected provinces would lower the employment rate in those provinces relative to more affected provinces and would tend to bias estimates obtained using the VHLSS upward to be more positive than otherwise, which is what we find.

Finally, with respect to healthcare utilization, we find that the BTA is associated with approximately a 10 percent decrease in use of inpatient services among children and adolescents.

Overall, we find evidence that, on average, the BTA had small effects on children's enrollment and work—increasing enrollment slightly and decreasing work commensurately among non-migrant children, which are the vast majority. Among migrants, however, the BTA had larger effects—decreasing enrollment and increasing work substantially. There was also evidence that the BTA increased school expenditures significantly for adolescents and improved health among younger children, as suggested by decreased use of healthcare services.

2. An Overview of the U.S. – Vietnam Bilateral Trade Agreement

Vietnam began its transition from a centrally planned economy to a market economy in 1986 when it was one of the poorest countries in the world. By embracing market principles and taking actions on trade liberalization, banking reform, private sector development, and public expenditure management, Vietnam achieved a rapid growth rate of between 7 and 8 percent in the 1990s (Glewwe, Agrawal, and Dollar, 2014). Like many developing countries, Vietnam relied on an export strategy to boost economic growth.

Trade and investment relations between the United States and Vietnam were reestablished in 1994 when President Clinton lifted the trade embargo on Vietnam. Although this action paved the way for trading between the two countries, Vietnamese exports to the U.S. remained relatively modest because of high U.S. tariffs. Vietnam was subject to Column 2 rates of the U.S. tariff schedule, which has a simple average of over 30 percent and is almost 10 times the 3.9 percent average rate applicable to countries that have Normal Trade Relations with the U.S. (Bergsten, 2005). The BTA was signed in July 2000 and went into effect in December 2001. The principal change it made was to grant Vietnam Normal Trade Relations, or MFN status, which guarantees that it will be treated no less favorably than any other trading partner of the United States. This resulted in Vietnamese exports being subject to the much lower MFN tariff rates and tariffs applied to Vietnamese products fell from over 30 percent to 3 percent (see Table 1). Since the trade agreement moved Vietnamese exports from one pre-existing schedule to another, it is unlikely that either U.S. or Vietnamese industries had much influence on the size of the tariff reductions (McCaig, 2011). This reduces concerns about the tariff reductions being endogenous to industry lobbying. McCaig and Pavcnik (2018) also present evidence of the lack of correlation between the tariff changes induced by the BTA and pre-existing industry trends and levels.[6] A second important feature of the BTA was the timing of tariff reductions. The U.S. tariff reductions came into effect immediately upon entry into force of the BTA. Given the size and speed of the tariff reductions, this makes it easier to identify the effects as compared to smaller, phased in tariff reductions.

Vietnamese exports to the United States surged by 128 percent in 2002 and by an additional 90 percent in 2003 (Figure 1). Just two years after the BTA came into force, the United States went from being one of Vietnam's smallest export markets to being its single largest. The share of the U.S. market in total exports rose from 5 to 18 percent between 2000 and 2002, and it then leveled off at about 20 percent in later years. The composition of Vietnamese exports to the United States changed from mainly primary products (namely coffee, crude oil, fish and seafood) to labor-intensive manufactured products, such as textiles and garments, footwear, and wood products. U.S. exports to Vietnam also rose, but at much slower

[6] Specifically, McCaig and Pavcnik (2018) show that the U.S. tariff reductions were not correlated with export growth to the EU following the BTA. This reduces concerns about correlated contemporary export demand shocks. Additionally, they show that the U.S. tariff reductions are not correlated with Vietnamese export growth to the U.S. or E.U. prior to the BTA, thereby helping to reduce concerns about correlated pre-existing trends.

rates since the United States already enjoyed MFN tariff status before the agreement was signed, and the agreement did not require Vietnam to lower tariffs significantly on U.S. products (Vietnam Ministry of Planning and Investment and US Agency for International Development, 2007).

In sum, the BTA caused a large and plausibly exogenous reduction in tariffs and a large increase in exports. We exploit this exogenous change to study how the BTA affected children's and adolescent's human capital investments. One empirical concern is whether there were other changes in trade policy in Vietnam or its major trading partners during this period that could confound the effects of the BTA. McCaig, Pavcnik, and Wong (2022) provide a detailed discussion that we briefly summarize.[7] Vietnam reduced it tariffs on imports from ASEAN countries between 2001 and 2007, and from China between 2007 and 2015. However, these tariff reductions are not significantly correlated with the BTA-induced US tariff reductions. In terms of foreign market access, Vietnam already had MFN access to China, the EU, and Japan. EU and Japanese tariffs on imports from Vietnam remained low throughout this period. China's tariffs on imports from Vietnam fell from 2000 through to 2010 due to both China's WTO commitments to lower its MFN tariffs and its trade agreement with ASEAN. However, the reductions in China's MFN tariffs are not strongly correlated with the change in US tariffs. Lastly, the EU imposed quantity restrictions on textile and clothing imports from Vietnam up to January 2005 and applied anti-dumping duties in imports of Vietnamese footwear between 2006 to 2011. McCaig, Pavcnik, and Wong (2022) show that excluding textiles, clothing, and footwear do not appreciably alter their main results.

3. Data and Summary Statistics

3.1. Overview

Data for the analysis are drawn from several sources: the 33 percent sample of the 1999 Vietnam Population and Housing Census and the 15 percent sample of the 2009 Vietnam Population and Housing Census; the U.S. International Trade Commission's U.S. tariff data; the 2002, 2004, 2006 and 2008 Vietnam Household Living Standard Surveys (VHLSS); and the 1993 and 1998 Vietnam Living Standard Surveys (VLSS).

3.2. Vietnam Household Living Standard Survey

One source of data for analyses of the effects of the BTA on adults and children are the 2002, 2004, 2006, and 2008 VHLSSs, which comprise provincially representative samples of Vietnamese households. The sample sizes are 74,343 households in 2002, 45,859 in 2004, 45,898 in 2006, and 45,945 in 2008.[8] The questionnaires include information on demographics, healthcare utilization, education, labor participation,

[7] See section 2.4 of McCaig, Pavcnik, and Wong (2022).

[8] The sample size decreased substantially in all the surveys from 2004 onward due to a reduction in cluster size, but the surveys remain representative at the national and provincial levels (Phung and Nguyen, 2004)

and household expenditures. We merge the samples from the three years, using information from 2002 as the baseline. The 2002 survey uses a 12-month recall period and was fielded from January to December 2002. Thus, the household information refers to the period between January to December 2001 and January to December 2002, depending on the survey time. Export expansion started in 2002 (Figure 1). Therefore, some fraction of outcomes in the 2002 survey may have been influenced by the tariff reductions. Consequently, our estimates using the VHLSSs are likely to be an underestimate of the total BTA effect. Note, however, that trade greatly expanded during the 2002 to 2008 period, which allows us to measure the effect of a substantial expansion in trade on children's human capital.

We use the 1993 and 1998 VLSSs to assess whether there were differential trends in outcomes prior to the BTA in provinces more or less affected by the BTA. The 1993 and 1998 VLSSs have a different sampling framework than the later VHLSSs and thus we do not use them together, but instead use the VLSSs separately to check for pre-existing trends that may be correlated with the BTA, like in McCaig and Pavcnik (2018). Unlike the later VHLSSs, the VLSSs had a smaller sample size and were not stratified by province.[9] Nonetheless, that we know of, this is the only data prior to the BTA that can be used to assess correlated pre-existing trends.

Our interest is in understanding the relationship between provincial tariffs and human capital investment in children and adolescents. For this reason, we restrict the sample to children ages 7 to 18. The final sample drawn from the VHLSS consists of 252,436 children from 135,719 households across the four surveys. In exploring the mechanisms that link the BTA to children's outcomes, we estimate the effects of the trade agreement on household expenditures, which is reported in the household surveys, but only for a smaller fraction (about 40 percent of households in the 2002 VHLSS and 20 percent of households in the 2004, 2006, and 2008 VHLSSs). We follow the recommendation of Doorslaer and O'Donnell (2008), who use expenditures instead of income to measure living standards in developing countries because of widespread employment in the informal and household sectors, which makes measuring income difficult. McCaig and Pavcnik (2015) estimate that 86 percent of workers age 20 to 64 are working in the informal business sector, including agriculture, in 1999.

Table 2 provides summary statistics from the VHLSS for 2002, which is the baseline survey, and 2004, 2006, and 2008 which are post-BTA surveys. The data show modest changes in children's education between 2002 and 2008. The education system in Vietnam consists of five years of primary school, four years of lower secondary school, three years of upper secondary school, and tertiary education. The enrollment rate increased from 90.7 percent in 2002 to 94.5 percent in 2008 for children ages 7 to 14 and from 56.8 percent to 69.0 percent for children ages 15 to 18. Although public education is free from Grade

[9] The 1993 VLSS was stratified by urban and rural regions while the 1998 VLSS was stratified by ten major regions: seven rural regions, Ha Noi, Ho Chi Minh City, and other urban areas.

1 through Grade 12, families still have to pay some education expenses. The data on education expenditures are slightly inconsistent across survey years[10]. In terms of healthcare, the VHLSS includes information about the use of any outpatient or inpatient services. There was a large increase in the use of outpatient services between 2002 and 2004-2008, which likely reflect the Health Care Funds for the Poor program implemented in 2003 (Wagstaff 2007). The table also suggests positive trends in both the probabilities that families spent money on children's healthcare and whether children had used any health services in the past 12 months.

3.3. 1999 and 2009 Censuses

One limitation of the VHLSSs is that the surveys exclude a significant proportion of migrants (Pincus and Sender, 2008). While aggregate rates of inter-province migration are relatively low (for example, 3 percent in the past 5-years) the absence of a portion of migrants in the VHLSSs means that, when using these data, we measure effects of the BTA on non-migrants and only a portion of migrants. This is a limitation of the VHLSS that may be important if there is significant migration in response to the BTA and/or migrants and non-migrants differ in their response to the BTA. To address this, we assess whether the BTA affected migration and how the effects of the BTA differ by migration status. For the migration analyses, we use the 1999 and 2009 Vietnam Censuses, which includes information about migration status. We also use the Censuses to conduct analyses of the effect of the BTA on adult work, and children's work and enrollment. The Censuses offer a different window of time than the VHLSS—reflecting longer period of adjustment to the BTA—and, importantly, allow for analyses investigating heterogeneous effects of the BTA by migration status.

Table 3 provides descriptive statistics from the 1999 and 2009 Censuses for individuals by age groups. Enrolment has increased for both children (ages 7 to 14) and adolescents (ages 15 to 18). Most working adolescents work in the informal sector.[11] Among young adults (ages 19 to 29), the overall prevalence of work has remained unchanged, but there has been a noticeable shift into working in the formal sector. Lastly, the rate of migration (moving across provincial boundaries during the past five years) has increased for both adolescents and young adults.

3.4. ***Constructing Provincial Tariff Reductions***

[10] Respondents are required to list detailed expenditures on school supplies, uniforms, transportation, lodging costs for boarding schools, contributions to schools' construction fund and parents' associations, and private tutoring, but the expenditure components slightly differ across years. Specifically, the 2004 survey does not include a separate category for expenses for studying outside the school district, which is usually a significant amount if a child is enrolled in a school not in his resident district, as in the other waves; the 2002 survey does not include family contribution to class funds; and while families can include private tutoring expenses for any subjects in education expenditures in 2002-2006, they can include private tutoring expenses for subjects taught in school only in 2008.

[11] We follow McCaig and Pavcnik (2015, 2018) and define formal based on the business the individual works for or is the owner of. A formal business is registered as an enterprise under Vietnam's Enterprise Law. This definition is consistent with that used in the literature (see McCaig and Pavcnik (2018) for further discussion).

The 1999 Census and the U.S. Trade Commission's tariffs are used to construct the measure of provincial exposure to the BTA, which is the province-specific, employment weighted average of U.S. tariff reductions. First, we calculate the provincial employment weights prior to the policy change using the 1999 Vietnam Population and Housing Census.[12] The U.S. International Trade Commission provides tariff database tables using the eight-digit Harmonized Tariff Schedule (HTS8). We rely on McCaig (2011) to convert the HTS8 tariffs into the tariffs expressed in ISIC3 (industry codes available in 1999 Census). The tariff cut within each industry is calculated by taking the difference between the Column 2 level tariffs (the pre-BTA tariffs) and the MFN tariff level (the post-BTA tariffs). We then calculate a weighted average tariff reduction in each Vietnamese province using the share of employment in each industry in 1999.[13] So, while the tariff reduction was the same in each industry, it differed across provinces because of differences in the industrial employment composition of the province.

We construct two measures of provincial tariff reductions that have been used previously:

$$\tau_p^k = \sum_j \omega_{jp}^k (\tau_{jCOL2} - \tau_{jMFN}) \qquad (1)$$

where $k \in \{1, 2\}$ and τ_{jCOL2} and τ_{jMFN} are the US Column 2 and MFN rates applied to industry j at the time the agreement was implemented.[14] The variation in the two measures is due to the set of industries used and the employment weights, ω_{jp}^k . For the first measure, the employment weight ω_{jp}^1 is the proportion of employment in industry j in province p out of total employment in both traded and non-traded sectors in province p:

$$\omega_{jp}^1 = L_{jp}/L_p^1 \qquad (2)$$

where L_{jp} is the number of workers in industry j in province p and L_p^1 is the total number of workers in province p. Non-traded industries are assumed to have a tariff change of zero and not directly affected by the trade agreement (Topalova, 2010; Edmonds et al., 2010; McCaig, 2011; Autor, Dorn, and Hanson, 2013). Using the first approach, the provincial tariff cut is larger when a greater share of the labor force in the province works in industries that received large tariff cuts. Importantly, because the trade agreement is expected to change employment composition, we compute the provincial employment weights for both measures using data from the 1999 Population and Housing Census, prior to the treatment, to avoid confounding effects on the employment composition induced by the agreement.

[12] This data set was compiled by the General Statistics Office (GSO) and provides information on employment across production sections at the 3-digit International Standard Industrial Classification of All Economic Activities Revision 3 (ISIC3) level.

[13] Three provinces were split between 2000 and 2008. To keep geographic location consistent, we adjust province boundaries to be compatible with those in the 1999 census when there were 61 provinces in total.

[14] McCaig (2011) shows that both the Column 2 and MFN rates were very stable both before and after the implementation of the BTA, consistent with the argument that neither American nor Vietnamese industries had an ability to influence the size of the tariff reductions.

An alternative way of measuring province-specific tariff reductions is the approach of Kovak (2013), which assumes that the expansion of trade caused by the BTA will have general equilibrium effects that extend to the non-traded sectors. Under the assumptions in Kovak (2013), the employment weight is the proportion of employment in industry j in province p out of total employment in traded sectors in province p when the BTA was passed and then calculated as the following:

$$\omega_{jp}^{2} = L_{jp}/L_{p}^{2} \qquad (3)$$

where L_{p}^{2} is the number of workers in province p in traded industries. The difference between the two measures lies in the denominators: the denominator in the first approach is the total employment in province p including both traded and non-traded sectors whereas the denominator in the second approach is the total employment in the traded sector only (Kovak, 2013). In the first approach, non-traded industries are assumed to have a tariff reduction of zero and thus to not be directly affected by the trade agreement. In contrast, the second approach assumes that the non-traded sectors are affected by the spillover effect of the trade agreement.

The second measure of the provincial tariff reductions is more dispersed: its standard deviation (3.64 percentage points) is approximately three times larger than the standard deviation of the first (1.24 percentage points). They both reflect the continuous treatment facing the provinces and are strongly correlated (0.81), as shown in Figure 3. No province was unaffected by the trade agreement since all provinces had a positive share of workers in traded industries that received U.S. tariff reductions.

4. Migration Analysis

In this section we explore the effect of the BTA on migration. We use data from the 1999 and 2009 population censuses for these analyses.[15] The Censuses asked where the individual resided five years prior to the census. We use this question to define an individual as an inter-provincial migrant if they resided in a different province five years prior to the census than they resided in at the time of the census. Migration might be important for examining the labor market effects of the BTA because a large share of those working in the formal, manufacturing sector are inter-provincial migrants as of the 2009 census. For example, 25 percent (18 percent) of individuals age 15 to 18 (19 to 45) that work in formal manufacturing are inter-provincial migrants.[16]

Children and youth are more likely to migrate on their own at older ages (Appendix Table A1). In 1999, the percentage of migrants that are reported as being a child of the household head falls from 85.5 to

[15] We use a 33% sample of the 1999 census made available to us by Bob Baulch and Nicholas Minot with permission from the General Statistics Office (GSO) of Vietnam and a 15% sample of the 2009 census obtained from the GSO.

[16] The estimates increase to 39 and 26 percent if we use sample weights.

17.2 percent from ages 10 to 18. In 2009, the decrease is even greater, from 83.5 to 8.7 percent. This suggests that older youth (e.g., 15 to 18) are migrating on their own, not as part of family migration.

To investigate whether migration is responsive to the BTA, we obtain estimates of the association between BTA tariff reductions and province level populations. Specifically, we estimate the following regression model:

$$Y_{pt} = \beta\tau_p^1\mathbb{I}(t = 2009) + \theta Z_p\mathbb{I}(t = 2009) + \delta_p + \theta_t + u_{pt} \qquad (4)$$

In equation (1), the dependent variable is the natural logarithm of the population in province p in year t. All regressions include province fixed effects (δ_p), year fixed effects (θ_t), and a vector of initial provincial characteristics (Z_p) interacted with a year 2009 indicator.[17] The key independent variable is the BTA province-specific tariff cut (τ_p^1) interacted with a year 2009 indicator. We estimated equation (4) for four different cohorts: individuals age 10 to 14 in 2009, 15 to 18 in 2009, 19 to 29 in 2009, and 30 to 54 in 2009.

4.1. Results

Prior to reporting regression results, we present two scatterplots of the change in ln population within a province versus our two measures of provincial exposure to the BTA in Figure 4. We focus on the cohort aged 19 to 29 at the time of the 2009 census. The figures demonstrate the importance of migration among this cohort as most provinces experienced a net decrease in population among this cohort. The out migration from these provinces was very concentrated in terms of destination. Among the eight provinces that expanded, three provinces (Ha Noi, Ho Chi Minh City, and Binh Duong) experienced a 0.5 or greater ln point increase in population among this cohort.

Estimates of the effect of the tariff cut on population are presented in Table 4. The results indicate that a one standard deviation in tariff reduction is associated with approximately a 3 percent increase in the population of children ages 10 to 14; a 10 percent increase in the population of teens ages 15 to 18; a 12% increase in the population of adults ages 19 to 29; and a 2 percent increase in the population of adults ages 30 to 54. The changes in population are almost surely driven by migration because changes in births associated with BTA, if any, would not affect children older than 10 and the death rates among people of these ages are very low. It is also important to note that these large effects of the BTA on population are consistent with the relatively low rates of between-province migration in Vietnam. The BTA had large effects on a relatively small number of provinces. The change in population we observe stems from migration from many relatively unaffected provinces to a relatively small number of heavily affected provinces.

[17] The vector of province characteristics in 1999 includes the share of the ethnic minority population, the share of individuals that migrated between 1994 and 1999, the natural logarithm of 1999 population, and the share of individuals in 1999 that had (i) not completed primary and (ii) completed primary, but not lower secondary.

Overall, there was significant migration in response to BTA tariff cuts and among those ages 15 to 29, migration was substantial. These changes in migration may affect estimates of the effects of the BTA on child and adult outcomes. If migration is selective with respect to school enrollment and work, then estimates of the effect of the BTA on these outcomes may be due partly to the compositional change. In addition, migrants may have different behavioral responses to the BTA-induced changes in labor market opportunities. We incorporate these possibilities into the analyses of the effect of the BTA on children's outcomes.

5. Analyses of the Effect of the BTA on Household Expenditures and Adult Work

As noted, the motivation for our analysis of children's outcomes is the likely effect of the BTA on household income and work. To assess this hypothesis, we examine whether the BTA led to any changes in household expenditures and employment of adults. Employment and income are the primary pathways through which the BTA might influence children's education and health.

To assess the causal impact of the BTA, we compare changes in outcomes of adults (i) living in provinces (p) with different exposure levels to the U.S. tariff reductions. Analyses are conducted using the VHLSSs for 2002, 2004, 2006, and 2008 and the Censuses for 1999 and 2009. The regression model is the following using the VHLSS years as an example:

$$Y_{ipt} = \sum_{2004}^{2008} \beta_t \left(\tau_p^1 * Year_t\right) + \gamma H_{it} + \sum_{2004}^{2008} \theta_t (Z_p * Year_t) + \delta_p + \theta_t + u_{ipt} \qquad (5)$$

We analyze several dependent variables (Y_{ipt}): household expenditures and different measures of adult work (any, in formal sector, in informal sector). Equation (5) includes province fixed effects (δ_p) that control for mean differences in the outcomes across provinces, and year fixed effects (θ_t) that control for common time effects. We also control for individual and household characteristics H_{it}, namely urban/rural residency; household size; individual age; and age, gender, education, and ethnicity of the household head.

One concern with this approach is that there are province-specific trends that are correlated with tariff reductions and outcomes. To address this issue, we include interactions between year dummy variables and the following provincial characteristics measured in 2002 ($Z_p * Year_t$): the share of ethnic minority groups and the share of people with primary school education or lower.

The key variables of interest are $\left(\tau_p * Year_t\right)$, where $Year_t$ denotes the year fixed effects and τ_p is a province-specific measure of tariff reduction. We standardize the tariff reduction so that a one-unit change represents a one-standard deviation change in tariffs. These variables measure the time pattern of effects associated with the BTA. The coefficients on $\left(\tau_p * Year_{2004}\right)$, $\left(\tau_p * Year_{2006}\right)$, and $\left(\tau_p * Year_{2008}\right)$ reflect the difference in the change in outcomes between 2004, 2006, and 2008 compared

to 2002. The difference-in-differences estimates measure the relative effect of the BTA in provinces with more or less exposure to tariff reductions.

A similar regression model is estimated using Census data. In this case, however, we only have two cross-sections: 1999 and 2009. The Census, however, does not report household expenditures and we use these data to study adult employment.

Before describing the results from the main analyses, we provide a visual summary of the relationships between the provincial tariff reductions and household expenditures and adult work. The associations between changes in household outcomes and adults' labor participation and tariff reduction are presented in Figures 5 and 6. Figure 5 shows that larger declines in tariffs are associated with greater total household expenditure increases. A one standard deviation reduction in tariffs is associated with a 1 to 3 percent increase in household expenditures. And as demonstrated in Figure 6, the probability of working of adults (19 to 29 years old) who live with children also increases by 1 to 2 percentage points in provinces with larger tariff cuts. Both correlations are significant at the 5 percent level.

Table 5 presents regression estimates of the effect of the BTA on nominal household expenditures among families with at least one child ages 7 to 18. The first three rows show estimates from one regression that allows the effects of the BTA on expenditures to differ in 2004, 2006, and 2008 and the fourth row shows the estimate from another regression that restricts the effects of tariff reductions to be the same in 2004, 2006, and 2008. All specifications include province fixed effects, year fixed effects, individual and household characteristics, and interactions between province baseline characteristics (share of population with primary education and share of ethnic minority population, and the baseline outcome at the provincial level) and year dummy variables. Because expenditures are skewed, we obtain estimates using Poisson regression with standard errors clustered by province. Estimates in Table 5 indicate that BTA tariff reductions increased household expenditures by 2006. A one standard deviation cut in tariffs was associated with approximately a 3 to 4 percent increase in household expenditure by 2008.[18]

Table 6 reports the estimated effects of the BTA on adult employment. We stratify the sample into two groups: ages 19-29 and 30-54.[19] We classify employment into the following categories: work v. no-work; work in formal sector v. no-work or work in informal sector; and work in informal sector v. no-work and work in formal sector. We present estimates from analyses that use the Censuses (top panel) and VHLSS (bottom panel).

Estimates in Table 6 obtained using Census data indicate that a one-standard deviation tariff reduction is associated with a very small (<1%), but significant decrease in employment among non-

[18] McCaig (2011) reported that the BTA was associated with an increase in wages, particularly among lower-educated workers. This finding is also consistent with the increase in household expenditures.

[19] We split the adult sample by these ages to be consistent with the earlier analysis of population changes in Table 4. We found young adults to be more likely to have recently migrated in response to the BTA than older adults.

migrants and a larger (2 to 4 percentage point) increase in employment among migrants. Estimates are similar across the two age groups. Estimates from the VHLSS are slightly different. A one-standard deviation decrease in tariffs is associated with a very small (1%), increase in employment for those ages 19 to 29 and a similarly small decrease in employment for those ages 30 to 54, although the effects vary by year. The differences between estimates from the Census and VHLSS may reflect the difference in time periods, but also the fact that the VHLSS does not separately identify migrants and likely does not include a large share of migrants. However, we note all estimates are small in magnitude and differences small too. Estimates may be reconciled by noting that migrants are selected on work—migrants are less likely to work, and migration was particularly high among those ages 19 to 29. Migration of adults ages 19 to 29 from less affected provinces will increase the employment rate in those provinces relative to more affected provinces (no out migration) and bias VHLSS estimates of the effect of BTA tariff reductions on work downward, which is consistent with the differences we observe between the Census and VHLSS estimates.

Tables 7 and 8 present similar estimates for employment in formal and informal sectors, respectively. Estimates in Table 7, which measure the effect of the BTA on work in the formal sector (v. other) indicate that the BTA increased work in the formal sector among those ages 30 to 54. Census estimates suggest approximately a 10% increase among non-migrants and a somewhat larger effect among migrants (not significantly different). VHLSS estimates suggest slightly smaller effect (2% to 5%). The BTA is not associated with changes in the probability of working in the formal sector among those ages 19 to 29 using the VHLSS but with a small positive effect among non-migrants in the Census estimates. Estimates of the effect of the BTA on work in the informal sector are consistent with previous estimates pertaining to any work and work in the formal sector. For example, among those ages 30 to 54, the BTA is associated with a decrease (1% to 3%) in work in the informal sector.

Overall, estimates in Tables 5-8 suggest that the BTA raised family income (expenditures) modestly, and part of this increase in household expenditures was driven by an increase in employment, particularly in the formal sector. Other evidence, for example McCaig (2011) and Fukase (2013), also suggest that wages increase in response to the BTA, which may partly explain the increase in expenditures. Finally, we note that estimates related to household expenditures are likely to be confounded by migration. For example, if migrants were negatively selected on household expenditures, which seems reasonable, then this would bias estimates of the effect of the BTA on household expenditures obtained from the VHLSS downward.

6. Estimates of the Effect of the BTA on Children's School Enrollment and Education Spending

The increase in household expenditures and adult employment in the formal sector associated with the BTA motivates the analysis of the effect of the BTA on children's outcomes. We estimate the effects

on school enrollment, school expenditures and work separately for children age 7 to 14 and age 15 to 18. We stratify by these ages because children ages 15 and above can be legally employed and therefore their opportunity cost of attending school will likely be higher. For health outcomes, we conduct separate analyses for children 7 to 14 and 15 to 18 because children's health differs by age as does the need for treatment: younger children have higher rates of utilization than those of older children (see Table 2).

6.1. Estimates of the Effect of the BTA on School Enrollment

We use a regression approach analogous to equation (2) for the analysis of children's outcomes. We first focus on children's school enrollment. We investigate whether the BTA affects school enrollment separately for children ages 7 (the age formal education begins in Vietnam) to 14 and 15 to 18 because the latter group has reached the minimum age for employment according to Vietnam's Labour Code 1994 (National Assembly of Vietnam, 1994). This older group of children is more likely to work and has substantially lower enrollment rates than the younger children.

Table 9 presents estimates of the effect of the BTA on school enrollment of children ages 7 to 14 and 15 to 18. The top panel reports estimates using Census data and the bottom reports estimates using the VHLSS. The first two columns present estimates for children ages 7 to 14 and the next two columns present estimates for children ages 15 to 18. All specifications include province fixed effects, year fixed effects, individual and household characteristics, and interactions between province baseline characteristics (share of population with primary education and share of ethnic minority population) and year dummy variables.

Estimates in Table 9 suggest that reductions in tariffs from the BTA had relatively little effect on non-migrant children's school enrollment. Most estimates are very small and not statistically significant. There is some evidence from Census estimates that school enrollment rose among non-migrant children ages 15 to 18 by 1% to 2%. Among migrant children, the BTA is associated with a 4 to 5 percentage point decline in enrollment. In relative terms, the decline in enrollment among migrant children ages 7 to 14 is about 5% and among adolescents ages 15 to 18 the decline is more than 10%. Migrant children are also less likely to be enrolled, and, therefore, migration would tend to increase the enrollment rate of children in origin provinces. This would tend to bias estimates obtained from the VHLSS upward because migrants are largely not included in these data. This may explain the differences between the Census estimates and the VHLSS estimates, which show almost no change in enrollment for both age groups.

Next, we estimate the effects on school expenditure. For these analyses, we only have data on school expenditures from the VHLSS. The expenditures are reported separately for each child. We examine two dependent variables: an indicator variable for positive expenditures and the level of expenditure. The first is estimated using a linear probability model and the second is estimated using a Poisson model. For both dependent variables the sample of observations is restricted to children that are enrolled. The top panel of Table 10 shows results for children ages 7 to 14 and the bottom panel contains estimates for adolescents

ages 15 to 18. Estimates show that, for both age groups, the BTA was associated with an increase in school expenditures. In 2008, school expenditures are 5% to 13% higher than in 2002 for children ages 7 to 14. For adolescents, school expenditures increase to 2006, by 8% to 13% relative to 2002, but then decline in 2008 relative to 2006.

6.2. Estimates of the Effect of the BTA on Adolescent Employment

In this section, we report results for adolescent employment. We limit the analysis to adolescents because employment rates of those under age 15 are very low (e.g., 10%). We use the same employment-related dependent variables as we did for adult analyses: work v. no work; work in formal sector v. other; and work in informal sector v. other. Estimates are reported in Table 11. The top panel shows estimates form the Census and the bottom panel shows estimates form the VHLSS.

Starting with Census estimates, among non-migrant adolescents, employment declined by approximately 5% (2 percentage points) with most of this due to a decline in informal work because very few adolescents work in the formal sector. A much different story applies to migrants. The BTA is associated with approximately a 12% increase (6 percentage points) in the probability of working and a particularly large increase (30%) in the probability of working in the formal sector. Estimates in the bottom panel of Table 11, which are obtained using VHLSS data, suggest that the BTA had no significant or meaningful effects on adolescent employment. Again, we note the likely bias from migration that is reflected in these estimates. Adolescent migrants are more likely to work than non-migrants. Migration out of less affected provinces would lower the employment rate in that province relative to more affected provinces and bias estimates of the effect of the BTA on employment upwards. We observe more positive (but still insignificant) estimates of the effect of the BTA on adolescent employment using VHLSS data.

6.3. Estimates of the Effect of the BTA on Children's Healthcare Utilization

In this section, we report estimates of the effects of the BTA on children's use of outpatient and inpatient healthcare. Only the VHLSS data have such information. We estimate the effects separately for children ages 7 to 14 and 15 to 18 because of different patterns of illness by age and, therefore, different demand for healthcare by age. Estimates are reported in Table 12; the top panel shows estimates for younger children and the bottom shows estimates for adolescents.

A consistent finding in Table 12 is that the BTA is associated with approximately a 10% decrease in the use of inpatient care for children ages 7 to 14. Given that inpatient care is associated with serious illness, these results suggest that the BTA is associated with improved health of children, although that is an indirect inference not based on a direct measure of child health.

7. An Assessment of the Validity of the Difference-in-differences Design

The difference-in-differences approach we use to obtain estimates of the effect of the BTA relies on the parallel trends assumption that, in the absence of the BTA, the temporal changes in outcomes would be the same across provinces. To provide evidence of the likely validity of the difference-in-differences design, we estimate regression models similar to those used in the main analysis above, but in the period prior to the BTA. Data for this analysis come from the Vietnam Living Standard Surveys in 1993 and 1998.

The model is:

$$Y_{ipt} = \alpha + \delta_p + Year1998_t + \beta\left(\tau_p^1 * Year1998_t\right) + \gamma H_{it} + \theta(Z_p * Year1998_t) + u_{ipt} \quad (5)$$

Note that we use the actual BTA tariff reduction experienced by the province in this regression. So, the model examines whether changes in outcomes between 1993 and 1998 in provinces that experienced relatively large tariff reductions as part of the BTA were the same as changes in outcomes in provinces that experienced relatively smaller tariff reductions.

Table 13 reports the results for this analysis for school enrollment, school expenditure, the probability of spending any resources on medical services for children, and household per capita expenditure.[20] Notably, most of the estimates associated with the 2001 BTA tariff reduction are statistically insignificant and small in magnitude. These results provide evidence to support the validity of the difference-in-difference research design.

8. Conclusion

The U.S.-Vietnam BTA caused an abrupt and substantial decline in U.S. tariffs on Vietnamese exports to the U.S., from over 30 percent to roughly 3 percent, in late 2001. Due to increased access to one of the largest markets in the world, Vietnam markedly expanded its exports and production. By exploiting differential exposure to the tariff reduction by provinces, this article examines the effects of export expansion on children and adolescents in the period following the trade agreement.

Estimates from our analysis indicate that the BTA was associated with approximately a four percent increase in household expenditures and a modest increase in adult employment, particularly in the formal sector. These changes in household resources and adult labor supply had relatively little effect on children's human capital. The BTA had, on average, small to no effect on school enrollment, but was associated with a 5% to 12% increase in expenditures on school conditional on school enrollment. Consistent with the enrollment estimates, we find that, on average, the BTA had relatively little effect on work of children. Finally, with respect to healthcare utilization, we find that the BTA is associated with approximately a 10

[20] Similar analyses for healthcare utilization and child employment cannot be conducted since the data are not available in the 1993 and 1998 VLSSs.

percent decrease in use of inpatient services among children and adolescents suggesting an improvement in health.

A novel finding of our analysis is results related to migration. The BTA was associated with significant migration into provinces that were heavily affected by tariff reductions. Migration was particularly large among those ages 15 to 18 and ages 19 to 29. These migration effects may have had an equilibrating effect on wages because migrants were more likely to work, particularly in the formal sector. Migration was also selective with respect to work and school attendance, and the compositional changes due to migration appear numerically important in terms of estimating effects of the BTA on children's outcomes.

Our findings for enrolment for adolescents (age 15 to 18) demonstrate how migration interacts with enrollment and stands in contrast to existing research (Atkin, 2016; Li, 2018). Specifically, Atkin (2016) estimates that for every 20 jobs created by the local expansion of export manufacturing in Mexico, one student dropped out of school by grade nine instead of continuing on through grade 12. These results are based on non-migrants only. Li (2018) finds that, in China, positive export demand shocks in high-skilled industries increased high school and college enrollment, while low-skill export shocks depress both. Additionally, Li (2018) reports that the positive low-skill export demand shocks are associated with an increase in inward migration of low-skilled workers. Our methodology more closely resembles Li (2018), making a comparison of magnitudes easier. For youth ages 15 to 18, our results suggest that a one-standard deviation increase in US tariff reductions is associated with about a 0.2 percentage point increase in school enrolment on an annual basis among non-migrants. However, migrants are less likely to be enrolled in general and particularly in provinces highly exposed to the BTA. The results in Li (2018) imply that a one-standard deviation increase in low-skilled exports led to a 0.05 and 0.3 percentage point annual reduction in enrolment for 16 to 18 year olds in the periods 1990 to 2000 and 2000 to 2005 respectively.

We find the impacts of the BTA on the prevalence of working among adolescents depend critically on migration. Five percent of adolescents moved across provinces between 2004 and 2009. They disproportionately moved to the provinces most exposed to the BTA and were more likely to work in these provinces than adolescents already residing in those provinces. In contrast, greater exposure to the BTA is associated with a decrease in the prevalence of work for non-migrant adolescents. The relationship between work and migration among adolescents in Vietnam contrasts with work from India where inter-district migration rates are much lower (Edmonds, Pavcnik, and Topalova (2009, 2010)). The results from Atkin (2016) using data from Mexico, are representative of the 80% of the census who are non-migrants.

These mixed results suggest that the exact nature of the shock matters as does the context. For example, focusing just on the positive export demand shocks, primarily in manufacturing, we find an increase in school enrolment among non-migrant adolescents, who represent the vast majority of the

adolescent population. These results stand in contrast to those of Atkin (2016) and Li (2018). Importantly, our works demonstrates that migration plays a key role as adolescent migrants are less likely to be enrolled. Hence, internal migration levels are a salient contextual feature.

Overall, our paper suggests that developing countries' adoption of an export-led strategy may expand job opportunities but may also lead to an unintended consequence, a decline in school attainment, which could diminish long-term growth of the economy.

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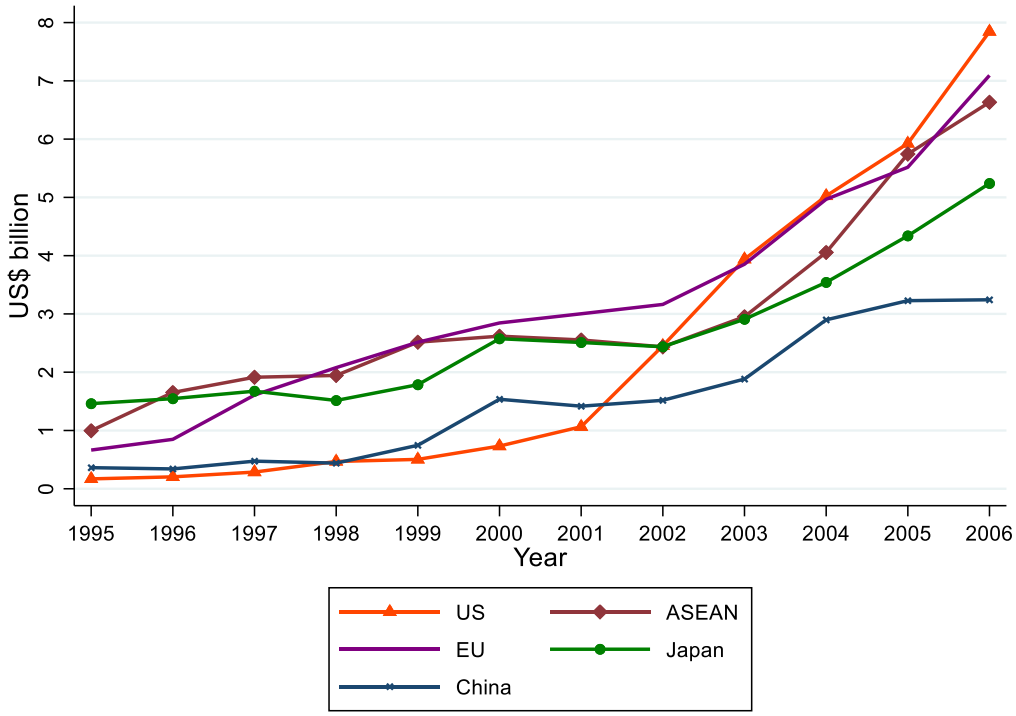
Figure 1: Value of Vietnam imports from and exports to the U.S.

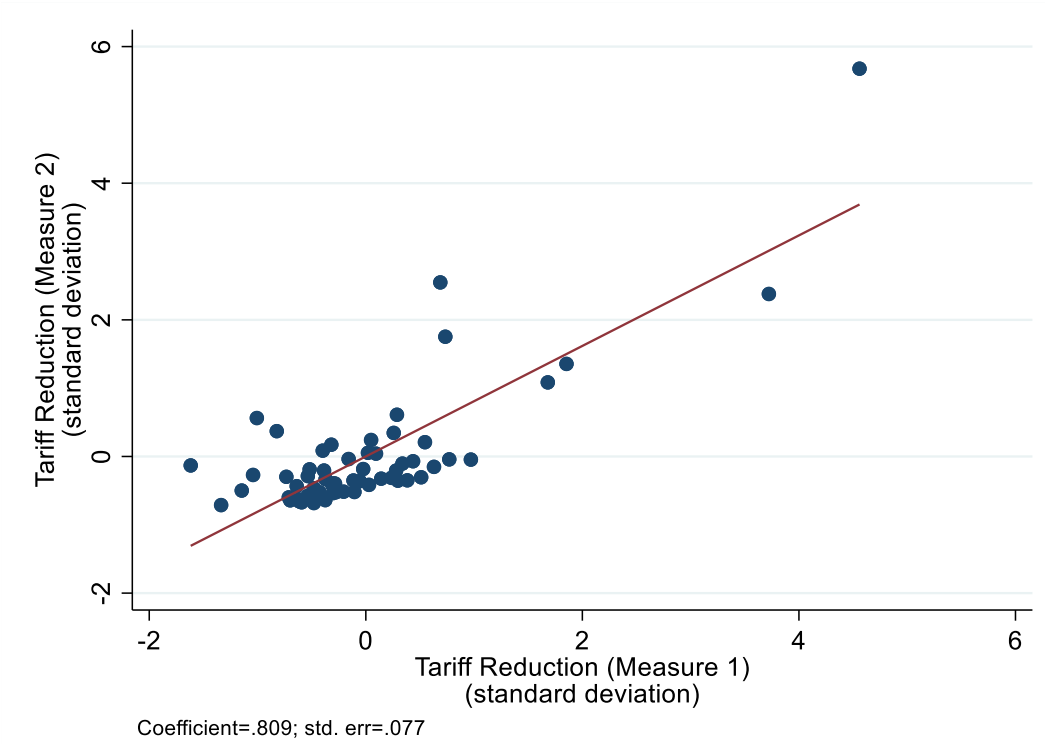
Notes: Data from U.S. Census Bureau 2018

Figure 2: Vietnam's Exports to Major Markets



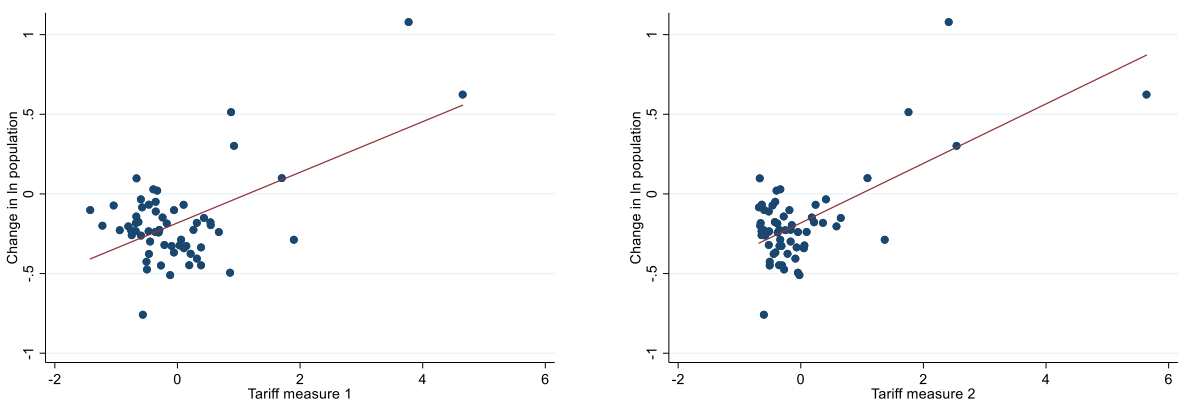
Notes: Data from GSO 2016

Figure 3: Tariff Reduction Measure 1 vs. Measure 2



Notes: This figure shows the correlation between the provincial tariff cut Measures 1 and 2, both of which are the average of tariff cuts of all industries weighted by the industry employment in the province, but the employment weights differ. Measure 1 includes workers in non-traded industries and assigns a tariff change of 0 to these industries while Measure 2 is a weighted average over only traded industries.

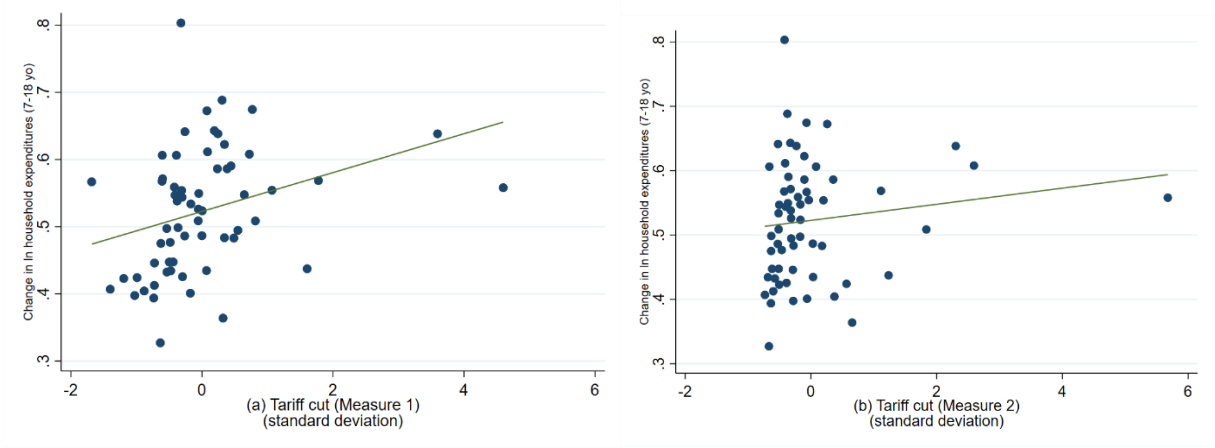
Figure 4: Change in ln population vs. provincial exposure to US tariff reductions



(a) Tariff measure 1 (b) Tariff measure 2

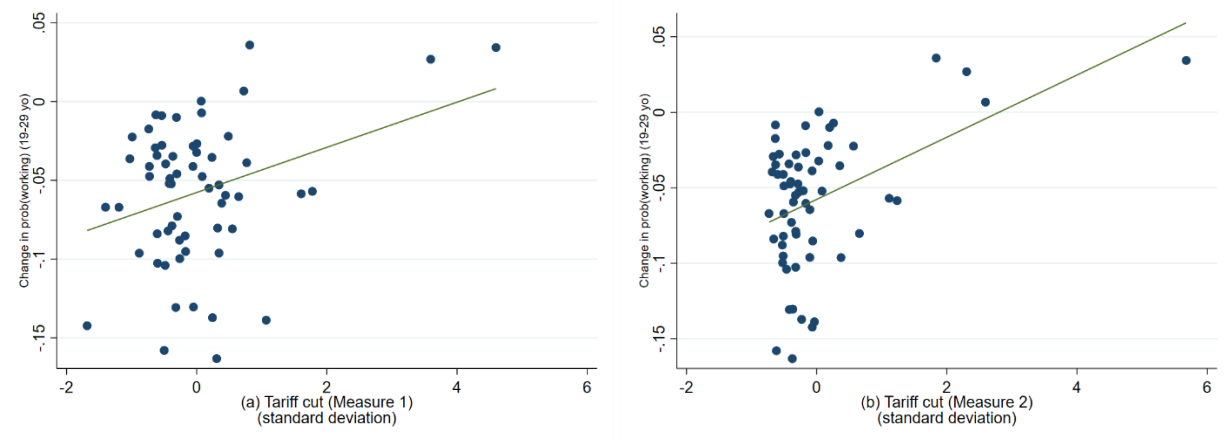
Notes: In both figures, the vertical axis plots the change in ln population between the 1999 and 2009 censuses for individuals aged 19 to 29 at the time of the 2009 census.

Figure 5: Change in ln household expenditures vs provincial exposure to US tariff reductions



Notes: In both figures, the vertical axis plots the change in ln household expenditures between the pre- (2002) and post-BTA (2004-2008) periods for households with children ages 7-18. For the pre-BTA observations, the simple mean of household expenditures within each province in 2002 is calculated first, and then the ln transformation is applied. For the post-BTA observations, the simple mean of household expenditures within each province pooled over 2004, 2006, and 2008 is calculated first, and then the ln transformation is applied.

Figure 6: Change in the probability of working vs provincial exposure to US tariff reductions



Notes: In both figures, the vertical axis plots the change in the probability of working between the pre- (2002) and post-BTA (2004-2008) periods for individuals ages 19-29 who lived with children.

Table 1. Summary of U.S. Tariffs Applied to Imports from Vietnam

Industry	Number of industries	Mean pre-BTA tariff (Column 2)	Mean post-BTA tariff (MFN)	Mean tariff cut	Standard deviation of tariff cut
Agriculture, hunting and forestry	3	0.085	0.016	0.069	0.01
Fishing	1	0.013	0.002	0.011	
Mining	9	0.027	0.001	0.026	0.045
Manufacturing	57	0.33	0.034	0.296	0.148
Other	6	0.08	0.002	0.077	0.111

Notes: The tariffs reported are weighted average tariffs. For each commodity-line tariff, its weight is the share of imports within the sector based on 2001 U.S. imports. Source: McCaig 2011

Table 2: Summary statistics from the VHLSSs

	2002	2004-2008
Outcomes		
Indicator for working (aged 15-18)	0.474	0.388
Indicator for working (aged 19-29)	0.824	0.757
Indicator for working (aged 30-45)	0.958	0.956
Employed in the formal sector (aged 15-18)	0.025	0.036
Employed in the formal sector (aged 19-29)	0.135	0.163
Employed in the formal sector (aged 30-45)	0.148	0.148
Employed in the informal sector (aged 15-18)	0.449	0.352
Employed in the informal sector (aged 19-29)	0.689	0.593
Employed in the informal sector (aged 30-45)	0.810	0.808
Household per capita expenditure (aged 7-18) (1000 VND)	3,537	6,723
School enrollment (aged 7-14)	0.907	0.944
School enrollment (aged 15-18)	0.568	0.673
Probability of having educational expenditures conditional on enrollment aged 7-14)	0.995	0.991
Probability of having educational expenditures conditional on enrollment aged 15-18)	0.993	0.992
School expenditure (aged 7-14) (VND)	348	620
School expenditure (aged 15-18) (VND)	896	1,361
Using any outpatient medical services (aged 7-14)	0.097	0.260
Using any outpatient medical services(aged 15-18)	0.071	0.187
Using any inpatient medical services (aged 7-14)	0.029	0.037
Using any inpatient medical services(aged 15-18)	0.028	0.032
Covariates		
Child's age	12.6 (0.011)	13.0 (0.009)
Child's gender (male=1)	0.513	0.512
Gender of household head (male=1)	0.827	0.822
Ethnicity of household head (major=1)	0.843	0.834
Household size	5.50 (0.006)	5.16 (0.004)
Household head's education		
Primary	0.560	0.525
Lower secondary	0.300	0.315
Higher secondary	0.110	0.128
College and above	0.029	0.032
Urban residency	0.194	0.201
Share of major ethnicity in province (major=1)	0.860	0.858
Share of primary education in province (aged 25+)	0.584	0.540
Num. observations	249,838	418,734

Notes: Each column gives the weighted average value for the outcome and control variables in the baseline (2002) and post-BTA years (2004-2008). Standard deviations for non-dichotomous variables are in parentheses. Survey weights are provided by the VHLSSs. All expenditures are in 2002 VND.

Table 3: Summary statistics from the censuses

	10-14		15-18		19-29		30-54	
	1999	2009	1999	2009	1999	2009	1999	2009
Enrolled	0.881	0.932	0.486	0.600	0.078	0.115	0.003	0.005
Worked	0.156		0.414	0.397	0.793	0.795	0.863	0.912
Worked formal	0.002		0.021	0.045	0.103	0.161	0.121	0.137
Worked informal	0.154		0.392	0.352	0.690	0.633	0.743	0.775
Urban	0.195	0.247	0.226	0.261	0.240	0.277	0.242	0.278
Female	0.487	0.479	0.494	0.484	0.490	0.504	0.526	0.514
Ethnic minority	0.157	0.178	0.137	0.162	0.143	0.195	0.122	0.137
Age	10.5	10.6	16.4	16.5	23.2	23.3	39.8	40.5
Migrant	0.015	0.012	0.032	0.050	0.062	0.072	0.019	0.014
Num. observations	4,887,292	2,004,966	2,241,690	1,205,074	2,233,001	997,349	5,535,008	3,229,356

Notes: Sources are the 33% and 15% samples of the 1999 and 2009 population censuses. Sample is restricted to individuals ages 10 to 54. All estimates use sampling weights. Questions related to working were not asked of individuals age 10 to 14 in the 2009 census. For individuals ages 19 to 29 and 30 to 54 the sample is restricted to households with children ages 7 to 18 in them.

Table 4: The effects of the BTA on provincial population

Dependent variable: ln population

	Tariff Measure 1 (1)	Tariff Measure 2 (2)
Panel A: Age 10-14 in 2009		
Tariff cut	0.0247*	0.0359***
	(0.0131)	(0.0115)
Observations	122	122
R-squared	0.994	0.995
Panel B: Age 15-18 in 2009		
Tariff cut	0.0961***	0.0979***
	(0.0265)	(0.0266)
Observations	122	122
R-squared	0.991	0.991
Panel C: Age 19-29 in 2009		
Tariff cut	0.120**	0.130***
	(0.0457)	(0.0403)
Observations	122	122
R-squared	0.984	0.985
Panel D: Age 30-54 in 2009		
Tariff cut	0.0245	0.0198
	(0.0191)	(0.0189)
Observations	122	122
R-squared	0.998	0.998

Standard errors clustered by province in parentheses.
*** p<0.01, ** p<0.05, * p<0.1.
Controls include the following 1999 provincial characteristics interacted with a 2009 indicator: share of population that is an ethnic minority, share of population that migrated across provinces between 1994 and 1999, ln population, share of population that did not complete primary, and share of population that completed primary. All regressions include province and year fixed effects.

Table 5: Estimates of the Effects of BTA on Household Expenditure
Dependent variable: total household expenditure

	Tariff Measure 1	Tariff Measure 2
	(1)	(2)
Tariff Cut x 2004	0.005	0.004
	(0.007)	(0.007)
Tariff Cut x 2006	0.030**	0.049***
	(0.013)	(0.011)
Tariff Cut x 2008	0.033***	0.038***
	(0.006)	(0.006)
Tariff Cut x Post (2004-2008)	0.025***	0.029***
	(0.005)	(0.006)
Observations	36,504	

Notes: This table provides estimates of the impacts of the BTA on household expenditure of households with children ages 7-18 using Equation (5) and a Poisson model. Estimates using Tariff Cut Measure 1 (employment weights use workers in all industries) are presented in Columns (1) and estimates using Tariff Cut Measure 2 (employment weights use workers in traded industries) are presented in Columns (2). All specifications control for province fixed effects, year fixed effects, gender, ethnicity and education of household heads, urban residency, household size, and child's gender and age. Provincial baseline characteristics include the shares of primary education and ethnic minorities in the population, and the average household expenditure of households with children in the province. Regressions are weighted using the sampling weights provided by the VHLSSs. Robust standard errors clustered at the province level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 6: The effects of the BTA on the incidence of working

Dependent variable: indicator for working

	19-29		30-54	
	Tariff Measure 1	Tariff Measure 2	Tariff Measure 1	Tariff Measure 2
	(1)	(2)	(3)	(4)
Panel A: Census				
Tariff cut x 2009	-0.00700**	-0.00501	-0.00716***	-0.00964***
	(0.00312)	(0.00318)	(0.00206)	(0.00198)
Tariff cut x 2009 x migrant	0.0454***	0.0331***	0.0203***	0.0200***
	(0.00674)	(0.00501)	(0.00362)	(0.00121)
Migrant	-0.0895***	-0.0896***	-0.0672***	-0.0672***
	(0.0296)	(0.0296)	(0.0190)	(0.0191)
Migrant x 2009	-0.00647	0.00994	0.0465**	0.0444**
	(0.0288)	(0.0324)	(0.0181)	(0.0173)
Mean in 1999 for non-migrants	0.803		0.865	
Mean in 1999 for migrants	0.646		0.775	
Observations	3,229,221		8,761,181	
R-squared	0.120	0.120	0.102	0.102
Panel B: VHLSSs				
Tariff Cut x 2004	0.006*	0.007	-0.001	-0.003
	(0.004)	(0.004)	(0.002)	(0.003)
Tariff Cut x 2006	0.003	0.006*	-0.003**	-0.006***
	(0.004)	(0.003)	(0.001)	(0.002)
Tariff Cut x 2008	0.012***	0.017***	0.002	0.002
	(0.003)	(0.004)	(0.002)	(0.003)
Tariff Cut x Post (2004-2008)	0.008***	0.010***	-0.001	-0.002
	(0.003)	(0.003)	(0.001)	(0.002)
Mean dep. var. in base year	0.805		0.955	
Observations	83,165		233,054	

Standard errors clustered by province. *** p<0.01, ** p<0.05, * p<0.1. All regressions using Census data include individual controls (urban indicator, female indicator, ethnic minority indicator, and age), the 1999 provincial mean of the dependent variable interacted with a 2009 indicator, province fixed effects, and year fixed effects. All regressions using VHLSSs include individual controls (age, female indicator, and urban indicator), household controls (gender, ethnicity and education of household heads and household size), provincial controls (the share of population aged 25 and above not completing lower secondary education, the share of minor ethnicity, provincial mean of dependent variables) interacted with time fixed effects, province fixed effects, and time fixed effects and are weighted using the sampling weights provided in the dataset.

Table 7: The effects of the BTA on the incidence of working in the formal sector
Dependent variable: indicator for working for a formal business

	19-29		30-54	
	Tariff Measure 1	Tariff Measure 2	Tariff Measure 1	Tariff Measure 2
	(1)	(2)	(3)	(4)
Panel A: Census				
Tariff cut x 2009	0.00902*	0.00236	0.0141***	0.0131***
	(0.00467)	(0.00370)	(0.00181)	(0.00148)
Tariff cut x 2009 x migrant	0.0180	0.00196	0.0213	0.00595
	(0.0157)	(0.00631)	(0.0187)	(0.0108)
Migrant	0.202***	0.202***	0.0198	0.0191
	(0.0333)	(0.0333)	(0.0166)	(0.0165)
Migrant x 2009	-0.136***	-0.101**	0.0175	0.0476
	(0.0426)	(0.0487)	(0.0231)	(0.0363)
Mean in 1999 for non-migrants	0.088		0.119	
Mean in 1999 for migrants	0.335		0.181	
Observations	3,226,522		8,754,412	
R-squared	0.105	0.105	0.107	0.106
Panel B: VHLSSs				
Tariff Cut x 2004	-0.002	-0.005	0.005***	0.006***
	(0.005)	(0.006)	(0.002)	(0.001)
Tariff Cut x 2006	-0.003	-0.009	0.003	0.004***
	(0.007)	(0.006)	(0.002)	(0.001)
Tariff Cut x 2008	-0.008	-0.016**	0.003*	0.003**
	(0.009)	(0.008)	(0.002)	(0.001)
Tariff Cut x Post (2004-2008)	-0.004	-0.010	0.004**	0.004***
	(0.006)	(0.006)	(0.001)	(0.001)
Mean dep. var. in base year	0.111		0.132	
Observations	83,165		233,054	

Standard errors clustered by province. *** p<0.01, ** p<0.05, * p<0.1. All regressions using Census data include individual controls (urban indicator, female indicator, ethnic minority indicator, and age), the 1999 provincial mean of the dependent variable interacted with a 2009 indicator, province fixed effects, and year fixed effects. All regressions using VHLSSs include individual controls (age, female indicator, and urban indicator), household controls (gender, ethnicity and education of household heads, and household size), provincial controls (the share of population aged 25 and above not completing lower secondary education, the share of minor ethnicity, provincial mean of dependent variables) interacted with time fixed effects, province fixed effects, and time fixed effects, and are weighted using the sampling weights provided in the dataset.

Table 8: The effects of the BTA on the incidence of working in the informal sector
Dependent variable: indicator for working for an informal business

	19-29		30-54	
	Tariff Measure 1	Tariff Measure 2	Tariff Measure 1	Tariff Measure 2
	(1)	(2)	(3)	(4)
Panel A: Census				
Tariff cut x 2009	-0.0243***	-0.0192***	-0.0193***	-0.0208***
	(0.00574)	(0.00622)	(0.00310)	(0.00311)
Tariff cut x 2009 x migrant	0.0277**	0.0328***	-0.000930	0.0143
	(0.0123)	(0.00470)	(0.0221)	(0.0111)
Migrant	-0.290***	-0.289***	-0.0871**	-0.0862**
	(0.0528)	(0.0525)	(0.0341)	(0.0340)
Migrant x 2009	0.123**	0.0997*	0.0289	-0.00415
	(0.0573)	(0.0571)	(0.0381)	(0.0470)
Mean in 1999 for non-migrants	0.715		0.746	
Mean in 1999 for migrants	0.311		0.594	
Observations	3,226,522		8,754,412	
R-squared	0.207	0.207	0.158	0.158
Panel B: VHLSSs				
Tariff Cut x 2004	0.003	0.007	-0.005**	-0.009***
	(0.005)	(0.005)	(0.002)	(0.002)
Tariff Cut x 2006	0.004	0.020***	-0.005*	-0.008***
	(0.007)	(0.006)	(0.003)	(0.002)
Tariff Cut x 2008	0.010	0.025***	-0.001	0.001
	(0.008)	(0.008)	(0.003)	(0.002)
Tariff Cut x Post (2004-2008)	0.006	0.017***	-0.003*	-0.005***
	(0.005)	(0.006)	(0.002)	(0.001)
Mean dep. var. in base year	0.695		0.823	
Observations	83,165		233,054	

Standard errors clustered by province. *** p<0.01, ** p<0.05, * p<0.1. All regressions include individual controls (urban indicator, female indicator, ethnic minority indicator, and age), the 1999 provincial mean of the dependent variable interacted with a 2009 indicator, province fixed effects, and year fixed effects. All regressions using VHLSSs include individual controls (age, female indicator, and urban indicator), household controls (gender, ethnicity and education of household heads, and household size), provincial controls (the share of population aged 25 and above not completing lower secondary education, the share of minor ethnicity, provincial mean of dependent variables) interacted with time fixed effects, province fixed effects, and time fixed effects, and are weighted using the sampling weights provided in the dataset.

Table 9: The effects of the BTA on school enrollment

Dependent variable: indicator for being enrolled in school

	7-14		15-18	
	Tariff Measure 1	Tariff Measure 2	Tariff Measure 1	Tariff Measure 2
	(1)	(2)	(3)	(4)
Panel A: Census				
Tariff cut x 2009	-0.000724	-0.00184***	0.00960**	0.00534*
	(0.00136)	(0.000616)	(0.00446)	(0.00304)
Tariff cut x 2009 x migrant	-0.0372***	-0.0265***	-0.0576***	-0.0375***
	(0.00942)	(0.00673)	(0.0118)	(0.00757)
Migrant	-0.0854***	-0.0858***	-0.154***	-0.155***
	(0.0109)	(0.0110)	(0.0225)	(0.0224)
Migrant x 2009	-0.00903	-0.0222	0.0573	0.0251
	(0.0127)	(0.0186)	(0.0354)	(0.0464)
Mean in 1999 for non-migrants	0.882		0.491	
Mean in 1999 for migrants	0.799		0.351	
Observations	6,888,655		3,446,041	
R-squared	0.099	0.099	0.162	0.161
Panel B: VHLSSs				
Tariff Cut x 2004	-0.002**	-0.001**	-0.000	-0.003
	(0.001)	(0.001)	(0.002)	(0.003)
Tariff Cut x 2006	-0.001	-0.000	0.006	-0.001
	(0.001)	(0.001)	(0.006)	(0.003)
Tariff Cut x 2008	-0.001	-0.001	0.007	0.000
	(0.002)	(0.001)	(0.005)	(0.004)
Tariff Cut x Post (2004-2008)	-0.001	-0.001	0.004	-0.001
	(0.001)	(0.001)	(0.004)	(0.003)
Mean dep. var. in base year	0.907		0.568	
Observations	161,084		91,352	

Standard errors clustered by province. *** p<0.01, ** p<0.05, * p<0.1. All regressions include individual controls (urban indicator, female indicator, ethnic minority indicator, and age), the 1999 provincial mean of the dependent variable interacted with a 2009 indicator, province fixed effects, and year fixed effects. All regressions using VHLSSs include individual controls (age, female indicator, and urban indicator), household controls (gender, ethnicity and education of household heads, and household size), provincial controls (the share of population aged 25 and above not completing lower secondary education, the share of minor ethnicity, provincial mean of dependent variables) interacted with time fixed effects, province fixed effects, and time fixed effects, and are weighted using the sampling weights provided in the dataset.

Table 10: The effect of the BTA on school spending conditional on enrollment

	Having any education expenses conditional on enrollment (OLS)		Amount of education expenses conditional on enrollment (Poisson)	
	Tariff Measure 1	Tariff Measure 2	Tariff Measure 1	Tariff Measure 2
	(1)	(2)	(3)	(4)
Panel A: Ages 7-14				
Tariff Cut x 2004	-0.001	-0.000	0.015	0.036*
	(0.002)	(0.001)	(0.018)	(0.020)
Tariff Cut x 2006	0.001	-0.000	0.057**	0.083**
	(0.001)	(0.001)	(0.025)	(0.035)
Tariff Cut x 2008	0.000	0.000	0.047*	0.119***
	(0.001)	(0.000)	(0.028)	(0.030)
Tariff Cut x Post (2004-2008)	0.000	-0.000	0.047**	0.097***
	(0.001)	(0.000)	(0.023)	(0.024)
Mean dep. var. in base year	0.995			
Observations	41,396		41,396	
Panel B: Ages 15-18				
Tariff Cut x 2004	0.002	0.001	0.037*	0.058***
	(0.001)	(0.001)	(0.019)	(0.014)
Tariff Cut x 2006	0.007***	0.003***	0.080**	0.122***
	(0.002)	(0.001)	(0.035)	(0.021)
Tariff Cut x 2008	0.001	-0.000	0.015	0.042***
	(0.001)	(0.001)	(0.023)	(0.014)
Tariff Cut x Post (2004-2008)	0.003***	0.001*	0.040*	0.068***
	(0.001)	(0.001)	(0.022)	(0.011)
Mean dep. var. in base year	0.993			
Observations	15,454		15,454	

Notes: This table provides estimates of the impacts of the BTA on child's schooling expenditures conditional on emrollment using Equation (5). Estimates using Tariff Cut Measure 1 (employment weights use workers in all industries) are presented in Columns (1) and (3), and estimates using Tariff Cut Measure 2 (employment weights use workers in traded industries) are presented in Columns (2) and (4). All specifications control for province fixed effects, year fixed effects, gender, ethnicity and education of household heads, urban residency, household size, and child's gender and age. Provincial baseline characteristics include the shares of primary education and ethnic Vietnamese in the population, and the average of the dependent variable at the province level. Regressions are weighted using the sampling weights provided by the VHLSSs. Robust standard errors clustered at the province level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 11: The effects of the BTA on the incidence of youth working (age 15-18)
Dependent variable: indicator for working

	Indicator for working		Indicator for working in the formal sector		Indicator for working in the informal sector	
	Tariff Measure 1	Tariff Measure 2	Tariff Measure 1	Tariff Measure 2	Tariff Measure 1	Tariff Measure 2
	(1)	(2)	(1)	(2)	(1)	(2)
Panel A: Census						
Tariff cut x 2009	-0.0207***	-0.0169***	-0.0109***	-0.0105***	-0.0272***	-0.0214***
	(0.00616)	(0.00575)	(0.00323)	(0.00214)	(0.00745)	(0.00730)
Tariff cut x 2009 x migrant	0.0781***	0.0570***	0.0510**	0.0250**	0.0257	0.0336***
	(0.0106)	(0.00797)	(0.0220)	(0.0104)	(0.0182)	(0.00806)
Migrant	0.131***	0.130***	0.135***	0.135***	-0.00201	-0.000994
	(0.0375)	(0.0378)	(0.0182)	(0.0183)	(0.0385)	(0.0385)
Migrant x 2009	-0.0564	-0.0252	-0.0195	0.0316	-0.0443	-0.0748*
	(0.0395)	(0.0490)	(0.0327)	(0.0502)	(0.0397)	(0.0428)
Mean in 1999 for non-migrants	0.411		0.016		0.395	
Mean in 1999 for migrants	0.489		0.168		0.321	
Observations	3,446,095		3,444,455		3,444,455	
R-squared	0.148	0.148	0.130	0.125	0.145	0.145
Panel B: VHLSSs						
Tariff Cut x 2004	-0.001	-0.004	0.006***	0.003***	-0.009	-0.011
	(0.006)	(0.007)	(0.001)	(0.001)	(0.006)	(0.007)
Tariff Cut x 2006	-0.003	0.004	0.002	0.001	-0.008	-0.000
	(0.007)	(0.005)	(0.003)	(0.002)	(0.007)	(0.006)
Tariff Cut x 2008	-0.005	-0.004	0.000	-0.003**	-0.011	-0.007
	(0.009)	(0.008)	(0.003)	(0.001)	(0.009)	(0.007)
Tariff Cut x Post (2004-2008)	-0.003	-0.001	0.003	0.000	-0.009	-0.006
	(0.005)	(0.005)	(0.002)	(0.001)	(0.006)	(0.005)
Mean dep. var. in base year	0.474		0.025		0.449	
Observations	91,352		91,352		91,352	

Standard errors clustered by province. *** p<0.01, ** p<0.05, * p<0.1. All regressions using Census data include individual controls (urban indicator, female indicator, ethnic minority indicator, and age), the 1999 provincial mean of the dependent variable interacted with a 2009 indicator, province fixed effects, and year fixed effects. All regressions using VHLSSs include individual controls (age, female indicator, and urban indicator), household controls (gender, ethnicity and education of household heads, and household size), provincial controls (the share of population aged 25 and above not completing lower secondary education, the share of minor ethnicity, provincial mean of dependent variables) interacted with time fixed effects, province fixed effects, and time fixed effects, and are weighted using the sampling weights provided in the dataset.

Table 12: The effects of the BTA on healthcare service utilization

	Indicator for using outpatient services		Indicator for using inpatient services	
	Tariff Measure 1	Tariff Measure 2	Tariff Measure 1	Tariff Measure 2
	(1)	(2)	(3)	(4)
Panel A: Age 7-14				
Tariff Cut x 2004	-0.011	-0.000	-0.003***	-0.002***
	(0.010)	(0.007)	(0.001)	(0.001)
Tariff Cut x 2006	-0.015*	-0.010	-0.005***	-0.004***
	(0.008)	(0.007)	(0.001)	(0.001)
Tariff Cut x 2008	-0.015*	-0.008	0.000	0.001
	(0.008)	(0.006)	(0.001)	(0.001)
Tariff Cut x Post (2004-2008)	-0.014*	-0.006	-0.002***	-0.001**
	(0.008)	(0.006)	(0.001)	(0.001)
Mean dep. var. in base year	0.097		0.029	
Observations	161,084		161,084	
Panel B: Age 15-18				
Tariff Cut x 2004	-0.005	0.006	-0.001	-0.000
	(0.010)	(0.004)	(0.001)	(0.001)
Tariff Cut x 2006	0.001	0.005	-0.003***	-0.002*
	(0.007)	(0.004)	(0.001)	(0.001)
Tariff Cut x 2008	-0.008*	-0.004	0.001	0.001
	(0.004)	(0.003)	(0.002)	(0.001)
Tariff Cut x Post (2004-2008)	-0.004	0.002	-0.001	-0.000
	(0.006)	(0.003)	(0.001)	(0.001)
Mean dep. var. in base year	0.071		0.028	
Observations	91,352		91,352	

Notes: This table provides estimates of the impacts of the BTA on healthcare utilization among children ages 7-18 years old using Equation (5). Estimates using Tariff Cut Measure 1 (employment weights use workers in all industries) are presented in Columns (1) and (3), and estimates using Tariff Cut Measure 2 (employment weights use workers in traded industries) are presented in Columns (2) and (4). All specifications control for province fixed effects, year fixed effects, gender, ethnicity and education of household heads, urban residency, household size, and child's gender and age. Provincial baseline characteristics include the shares of primary education and ethnic Vietnamese in the population, and mean of dependent variables. Regressions are weighted using the sampling weights provided by the VHLSSs. Robust standard errors clustered at the province level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 13: The effects of BTA in the pre-policy period

	Age 7-14		Age 15-18	
	Tariff Measure 1	Tariff Measure 2	Tariff Measure 1	Tariff Measure 2
	(1)	(2)	(3)	(4)
Panel A. Effects on School Enrollment (OLS)				
Tariff Cut x 1998	-0.008	-0.007	-0.011	-0.004
	(0.006)	(0.005)	(0.010)	(0.007)
Mean in 1993	0.780		0.266	
Observations	10,136		10,136	
R-squared	0.119	0.119	0.265	0.265
Panel B. Effects on the Probability of Spending Any Money on Child' Schooling (OLS)				
Tariff Cut x 1998	0.002	0.002***	-0.004	-0.004
	(0.001)	(0.001)	(0.003)	(0.003)
Mean in 1993	0.825		0.260	
Observations	7,631		7,631	
R-squared	0.023	0.023	0.084	0.085
Panel C. Effects on School Expenditure (Poisson)				
Tariff Cut x 1998	0.028	0.014	0.016	0.014
	(0.025)	(0.018)	(0.031)	(0.024)
Mean in 1993	124		116	
Observations	7,631		1,812	
Panel D. Effects on the Probability of Spending on Healthcare (OLS)				
Tariff Cut x 1998	-0.006	0.003	0.023	0.018
	(0.012)	(0.010)	(0.018)	(0.014)
Mean in 1993	0.812		0.718	
Observations	10,136		10,136	
R-squared	0.108	0.108	0.131	0.130
Panel E. Effects on Household Expenditure (Poisson)				
Tariff Cut x 1998	0.018	-0.018		
	(0.025)	(0.014)		
Mean in 1993	7,313			
Observations	8,495			

Notes: This table provides estimates of the impacts of the BTA on the interested outcomes in the pre-BTA period using Equation (5). All specifications control for province fixed effects, year fixed effects, gender, ethnicity and education of household heads, urban residency, and the interaction of year 98 indicator and urban. Provincial baseline characteristics include the shares of primary education and major ethnicity in the population. Robust standard errors clustered at the province level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A1: Relationship to household head of migrants

Age	Head	Spouse	Child	Other
		1999		
10	0.004	0.000	0.855	0.141
11	0.004	0.000	0.845	0.151
12	0.006	0.000	0.830	0.164
13	0.006	0.000	0.790	0.204
14	0.009	0.000	0.732	0.259
15	0.012	0.002	0.634	0.353
16	0.021	0.005	0.504	0.470
17	0.029	0.012	0.369	0.590
18	0.053	0.015	0.172	0.761
		2009		
10	0.005	0.000	0.835	0.160
11	0.002	0.001	0.810	0.187
12	0.003	0.000	0.814	0.182
13	0.005	0.000	0.782	0.213
14	0.009	0.000	0.692	0.298
15	0.027	0.006	0.519	0.448
16	0.056	0.011	0.355	0.578
17	0.082	0.024	0.261	0.633
18	0.221	0.025	0.087	0.667