Child Labor and FDI: Evidence from Vietnam

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Abstract

The objective of this paper is to provide evidence regarding the impact of FDI on child labor in Vietnam. Starting with the reforms in the late 1980s Vietnam experienced an economic boom which led to an important decline in poverty and child labor. The 2000 decade witnessed a drastic acceleration of the structural transition away from agriculture. In this paper we merge repeated household surveys and enterprise censuses to explore the contribution of foreign firms to the decline in child labor. We find that while higher demand for labor by domestic firms tends to increase child labor, the entry of FDI in both the manufacturing and services sectors have contributed to reduce the labor supply of children. The impact of FDI in the service sector has so far been smaller than in manufacturing. This is partly due to the fact that FDI into the services sector has been limited, more capital-intensive and concentrated in the richest provinces, but also perhaps to the fact that manufacturing firms may be more easily targeted by trade policy in the rest of the world or consumer boycotts associated with child labor.

1. Introduction

Critics of globalization argue that openness often comes with the exploitation of workers in developing countries where worker protection is weaker. The global market pushes firms to relocate in these countries boosting their labor demand, which creates incentives for governments to lower their labor standards. More importantly for our purposes, FDI investments may create incentives for children to enter or increase their participation in the workplace. Well publicized cases in the 1990s of children being exploited by multinational companies in developing countries fueled this view.[1] There is

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[1] See for example the debate around the 1994 football world cup in the United States, where it was found that most footballs produced in the world were undertaken by foreign companies subsidiaries that employed child labor. As an example, see Sydney Shanberg, "Six Cents an Hour: On the Playgrounds of America, Every Kids' Goal Is To Score. In Pakistan, Where

however evidence that FDI firms tend to pay higher wages than domestic firms (Lipsey et al., 2007). FDI firms tend also to produce more complex goods, which might demand more specialized, adult labor. Finally, foreign firms serving international markets are more exposed to media than domestic firms, and might thus prefer not to risk hiring children.

Service trade liberalization can generate important employment and efficiency gains in developing countries, and thus represent an important driver of economic growth. Economic growth, in turn, is a major determinant of poverty reduction. However, many observers argue that the poor are likely not to benefit from openness as the non-poor, and these distributional outcomes might hamper the poverty impacts of liberalization (Nicita, 2006). The effects of integration into the world economy on poverty depend crucially on the extent to which the poor benefit of the new employment opportunities from export activities and foreign direct investments. If the poor are marginalized, either because they live far from the most dynamic areas or they lack relevant skills, then the overall effects of openness on the poor can be small. The effects can be even negative in the short-medium term if liberalization puts pressure on the poor households' production system, introducing sudden variations in prices and availability of inputs.

This paper analyzes the effects of a particular outcome of service trade liberalization, i.e. foreign direct investment in services, on one crucial indicator of households' welfare, i.e. work and education choices of children. We study the case of Vietnam as this country has experienced an extremely rapid transition from a very closed to a very open economy, with industrial policies strongly focused on the attraction of FDI. The activities of foreign companies are a primary component of service trade liberalization, alone accounting for about one-half of all transactions falling under the GATS (WTO, *International Trade Statistics,* Geneva: WTO, 2005 p. 8.). Labor supply and education investments of children and teenagers are a relevant indicator of households' living standards and exposure to external shocks, well reflecting different adjustment capacities of poor and non-poor households. Studying the effects of FDI on the labor supply of children can also help understand the dynamic effects of openness, as the long term impact on growth clearly depends on how human capital investments adjust.

Our empirical work relies on three waves of household data and enterprise census data for the period from 2002 to 2006. The two datasets are matched at the level of the 64 Vietnamese provinces. The household surveys are nationally representative and rich in details over the time allocation of all family members. The enterprise data provide accurate information on the distribution and composition of

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Children Stitch Soccer Balls for Six Cents An Hour, The Goal is To Survive," *Life*, June, 1996, p. 38. The article's lead photograph showed 12-year-old Tariq surrounded by Nike soccer ball which he would spend most of a day stitching together for the grand sum of 60 cents. In a matter of weeks, activists all across Canada and the United States were standing in front of Nike outlets, holding up Tariq's photo.

wage earning opportunities over the country, since they cover all the business entities keeping business accounts and registered under Vietnamese Law. Thanks to the large heterogeneity in exposure to foreign investment across provinces and over time, we can identify the correlation between changes in the number of foreign owned firms in local labor markets and children employment.

Provinces with higher rates of FDI growth experience a faster fall in children's labor supply (10-14 years old). The composition of FDI investments is also important. FDI in manufacturing is found to have a larger effect than FDI in the service sector. The relatively higher entry of FDI in mining and low-skill manufacturing (textile and food processing) in provinces with higher rates of child labor might explain this result. FDI in services has so far been limited to highly capital-intensive firms.

While it is difficult to conclude that higher FDI investments have a strong causal effect on child labor, our findings support the view that FDI are on average 'high quality' employers in rapidly industrializing environments. This finding is important as child labor seems to increase in those provinces that are industrializing at a faster rate. In this second phase of the Vietnamese transition, we observe a rapid reallocation of family labor across activities, with family members substituting household production for labor supply outside the household. Given the still modest absorption capacities of the new firms and the consequent rise in unemployment, this substitution amounts to trading-off a low-earning, relatively secure source of income – household farming – with a higher earning, but more uncertain, income source – wage labor. Even if all the family members leaving agriculture manage to be hired in the new firms, the pressure on children' time can increase as adult and young enter the wage market, making scarcer the labor available for household production. This adjustment in the labor supply within the household is stronger among poor families, who may lack the resources to hire outside labor for household production.

On the other hand, as mentioned earlier when the new economic opportunities are offered by foreign firms, children's labor supply seems to decline. This could be explained by a relative decline in the relative wage offered to children in provinces where FDI is prominent (due perhaps to a stronger reluctance by foreign firms to hire child labor), but also a stronger income effect associated with higher wages paid to adults that could help them move beyond their minimum income needs (such as in Basu, K. and H. Zarghamee, 2009) and reduce the reliance on child labor income.

Another finding of the paper is that a higher entry of foreign firms into services increases school enrollment rates of 6-19 years old children. This latter result is probably linked to the higher skill content of production of FDI firms. As FDI in the service sector tends to employ more educated labor, the current liberalization process and the consequent increase in the weight of FDI in services could

have an impact on expected returns to higher schooling and discourage education drop-outs in the future.

The paper is organized as follows. The next section overviews the literature on openness, within-household labor supply and child labor. Section 3 presents the firm-level and household data used in the paper, and discusses the large heterogeneities in education and working choices of children and young across income groups and Vietnamese provinces. Section 4 discusses the methodology and the empirical results, while section 5 concludes.

2. FDI and child labor, a review of the evidence

While the enforcement of child labor laws may not be as strong as in other parts of the world, Vietnam experienced a rapid decline in child labor in the 1990s (Edmonds and Turk, 2002). Such a decrease in labor market participation of the young has been mainly attributed to the rapid economic growth in Vietnam, which is consistent with the dominant view among economist. Indeed, there is now a consensus in the economic literature that the main cause of child labor is poverty (see Edmonds, 2008 or Basu, Das and Dutta, 2009).

In Becker's view of time allocation within households, putting children to work is seen as a rational household decision. It is poverty and lack of opportunities for both parents and kids that push children into the labor force. This makes economists very skeptical of regulations that impose the elimination of child labor. According to economic historians (see Nardinelli 1990) the elimination of child labor in Europe and the United States in the 19th and early 20th century had as much to do with child labor legislation as technological progress and growth that made it possible for households not to send their children to work. Thus, when considering policies aimed at eliminating child labor one needs to focus on policies that eliminate the dependency of poor households on children's income, i.e., the reason why children are working. This requires policies that would lead to an increase in income for poor households. Conditional cash transfers, such as Progresa in Mexico, seem to be an effective tool. But policies that simply forbid the utilization of child labor such as consumer boycotts or trade sanctions may be counterproductive. Indeed, they may result in a displacement of child labor from companies hit by boycotts or sanctions to other firms, where employment can actually be more dangerous. They can also increase child labor in other firms, as lower wages for child labor associated with these polices (as demand declines) may actually result in a stronger need for sending children to the workplace. In other

words, lower wages for child labor may imply that more children are sent to work in order to meet the minimum income needs of the family (see Basu and Zarghamee, 2009).[2]

The rapid increase in FDI experienced by Vietnam in the 1990 is in principle an engine of growth and therefore contributed to improving poor households' income (see UNCTAD, 2008). This should then help reduce child labor contrary to what was suggested in the debates in the 1990s. Moreover, consumer activism and government legislation in OECD countries has made their multinational firms very reluctant of hiring child labor.[3] This may also seem to lead to a reduction in child labor at first sight.

However, as argued above, this type of decisions may backfire and lead to more, not less child labor, as reduction in child labor demand may actually lead to an increase in child labor in equilibrium in order to match the income needs of poor families. Thus FDI will generally lead to a reduction of child labor as it improves the economic opportunities for local workers, but paradoxically it may also lead to an increase in child labor when FDI is accompanied by measures that prevent child employment by multinationals, as child workers reallocate into other sectors or are forced to enter the labor market.

A second channel by which FDI might affect child labor is the induced change in employment choices of the adults. In fact, for given level of household income, one can expect that children of the self-employed have higher labor market participation rates than children of the salaried workers (see Parick and Sadoulet, 2006). In developing countries, owners of micro-enterprises tend to rely heavily on labor inputs from their families, as family workers are not only cheaper but also more flexible. If FDI increases mobility from self-employment to salaried work, this could reinforce a negative relationship between FDI and child labor. However, if adult workers hired by multinationals are replaced at their home enterprise by their spouses and children, then FDI might actually increase child labor through this channel.

As child labor tends to be concentrated in poor and relatively uneducated families, it is important to consider the effect of FDI on wage inequality in host countries. Foreign direct investment and outsourcing by multinational firms can raise relative demand for skilled labor, increasing wage inequality. Feenstra and Hanson (1997) found that capital transfer by American firms can account for the bulk of the increase in the skilled labor share of total wage bill that occurred in Mexico in the late 1980s. If the income of the skilled and wealthier rise while those of the poor remain stagnant, rising

[2] One can think of the income effect dominating the substitution effect in the children labor supply function, which implies that at very low wages, their labor supply slopes downwards.
[3] For example the football scandal in Sialkot (Pakistan) led to the Atlanta Agreement in 1997, where the United States' Sporting Goods Manufacturers Association and the Sialkot Chamber of Commerce and Industry pledged to eliminate child labor from the stitching and production of soccer balls.

prices in the consumption basket might affect the purchasing power of those at higher risk of poverty, potentially raising child labor.[4]

Thus, whether the rapid increase in FDI has led to a reduction or an increase in child labor is an empirical question. Cross country evidence provided by Newmayer and Soysa (2005) in a sample of 145 countries suggests that FDI leads indeed to a reduction in child labor. However, there could be quite significant (observed and unobserved) heterogeneity in the relationship between FDI and child labor. For example, FDI from non-OECD countries may have a different impact than FDI from OECD countries, simply because the latter is more likely to be subject to consumer activism, or because host countries vary in their enforcement of child labor laws.

Moreover, Newmayer and Soysa do not address the endogeneity problem, and this could potentially lead to significant biases. For example, FDI may be attracted to countries with higher skill endowments (see Blonigen et al, 2007 for evidence), and countries with higher skill endowments tend to be richer and have less child labor for reasons that have little to do with FDI. Davies and Voy (2009) address this issue in a cross-country setup and show that and show that the negative relationship between FDI and child labor disappears once they instrument and control for GDP per capita, suggesting that the main channel through which FDI affects child labor is through its impact on GDP per capita. This confirms the micro-economic view that what matters most for child labor is household income. It also raises the question of whether the decision of multinationals not to employ children has any impact on the child labor employment by other firms. Their results suggest that it would only lead to a reallocation effect from foreign to domestic firms (in the non tradeable sector). But their aggregate cross country approach does not allow them to disentangle the mechanism. In order to deepen our understanding of the complex links between FDI and child labor, we propose a different identification strategy based on merged micro-data for enterprises and families over multiple years.

3. FDI, structural changes and labor supply in Vietnam: decriptive evidence

This section provides descriptive information on the industrialization process and labor market choices of families in Vietnam during the first half of the 2000s.

Data

[4] The overall CPI in Vietnam increased around 23 percent during the first 9 months of 2008. During these months, the food and non-food CPIs increased by 36 percent and 13 percent, respectively (Nguyen, 2009). High inflation can have ambiguous impacts on the poor. The real consumption of the poor can be reduced by inflation. On the other hand, the poor are also producers who can experience increases in income due to inflation. Depending on the reason of inflation and the structure of the economy, the effect of price increases on poverty can be negative and positive.

We use two complementary sources of data. The first dataset is a census of establishments in Vietnam. These establishment data are particularly suited to the analysis of labor demand in service sectors, given their wide coverage. We use three waves of the census that collect information on enterprises' ownership, productive factors (labor, capital, assets,…) and business results in 2002, 2004 and 2006. We derive from these data unique information on the number, ownership and characteristics of enterprises which started their activity between 2001 and 2006. This information is used to construct the main explanatory variables in our models.

The second source of data consists of repeated household and community surveys for 2002, 2004 and 2006, called the Vietnam Household Living Standard Surveys (VHLSS). The data are representative at the national and province level, including detailed community level questionnaires only for the communes in rural areas. The household survey contains information on number of household members, their age, their income, whether they work or attend school, the level of education of the household head, the overall household expenditure and income, as well as the locality where the household lives. The number of sampled households in VHLSS 2002, 2004 and 2006 is 29533, 9188, and 9189, respectively. Around 4000 thousand families are observed longitudinally for two waves, while a more limited sample of around 1900 households is observed over all the three waves.

The situation of foreign and domestic enterprises

The *Doi Moi* (renovation) policies in Vietnam brought about remarkable results in terms of economic growth and poverty reduction. Over the last two decades (1986-2006), GDP growth has hovered around 7.5 percent per year on average and export growth nearly 20 percent per year. The strong growth posted by the Vietnamese economy has sent poverty rates tumbling since the 1990s. The poverty headcount has been slashed from 58 percent in 1993 to 16 percent in 2006. The number of people below the food poverty line also declined from 25 to 7 percent during the same period (Nguyen, 2009).

There is an extensive literature describing the Vietnamese transition in the '90s. This section supplements this literature by describing the rapid evolution of Vietnam in the first years of 2000. This second phase of the Vietnamese transition was market by a pronounced industrialization, in part sustained by a new surge of FDI investments after the stalling phase between 1997 and 1999. The region that experienced the greatest decrease in child labor is the Red River Delta, the economic centre of northern Vietnam. As noted by Mai (2004), most of the FDI in the River Delta region was channeled towards services.[5]

[5] Haiphong, Vietnam's main port, lies on a branch of the delta. A major highway crosses the delta and the coastal strip beyond, an important transportation route linking China and Vietnam.

Although FDI into manufacturing has traditionally attracted an important share of FDI, recent reforms associated with Vietnam's WTO accession have significantly increased the share of services FDI. This started with accession negotiations in 1995 and culminated with the adoption of the Law on Investment in 1995. Hurdles for services foreign direct investment are still relatively important (most of the 14 sectors subject to conditional approval are services sectors: see Law on Investment 59-2005-QH11). However, according to Doanh (2002) services FDI (hotels, restaurants, transportation and communication and other service industries like insurance) accounted for 22% of the total projects and 40% of the total committed capital in 2002.

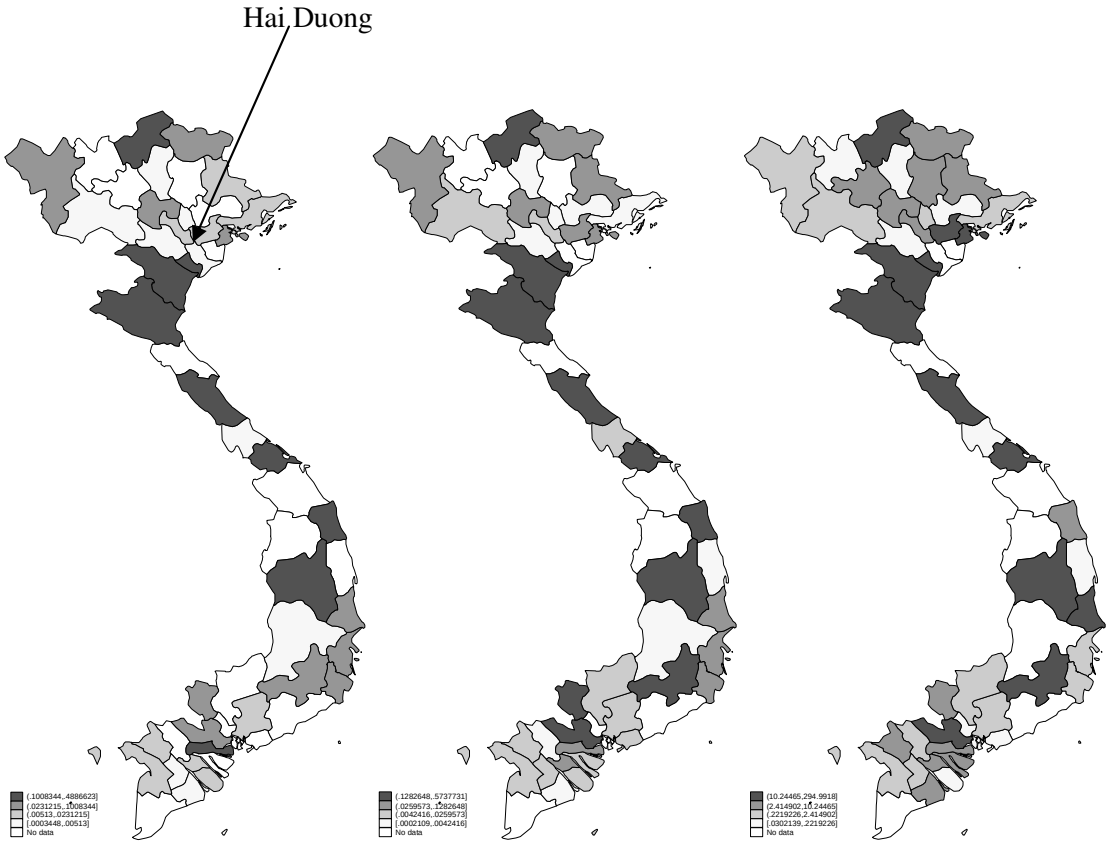
In terms of FDI sources, the share of OECD countries FDI stock in Vietnam is around 42 percent (EU 14 percent, Korea 12, Japan 11 and the US 5 percent). Singapore, Taiwan and Hong Kong account for 30 percent, and the rest of Asean for another 8 percent. This implies that legal restrictions in the source country regarding employment in the host country which are common in OECD countries may not be such a binding constraint in Vietnam where a large share of FDI comes from non-OECD sources.

The most compelling indicator of the structural change in Vietnam is the decreasing share of employment in agriculture. In 2006, 73% of the total population of 83 million people lived in rural areas (UNFPA, 2008). The number of rural households in Vietnam was 9.74 million, a decrease of 950000 households (8.9%) compared with 2001. This reduction results from continuous population growth (1.21% and in 2006), associated with low productivity growth of agriculture and progressive conversion of land for the development of industrial zones. According to MONRE figures, 162 industrial zones had been approved by the government by the end of 2004, of which 68 were already in operation and 44 were in the process of establishment (Viet Hung, 2007). A high proportion of industrial zone land is converted from agricultural use (76%) and large numbers of rural households have been effected (408,698 individuals according to MONRE figures quoted in Ngo Viet Hung, 2007). While many rural households are diversifying their income sources by engaging in wage earning, they still keep their farmland as a stable income source (Thinh, 2009).

The maps in figure 1 show the evolution of the share of FDI employees over total census enterprise's employees in 2002, 2004 and 2006. As can be seen, the number of provinces with no FDI employment (in white) diminishes during this period, suggesting that FDI investments are spreading outside the most dynamic areas of the Red River Delta (the Hanoi region in the north) and of the Mekong Delta and South East regions (where Ho Chi Minh city is located). The tendency for new investments has been to locate more in neighboring areas because of the increasing costs of operating in the two major cities. It is interesting to observe that Hai Duong, the province in the Red River Delta most affected by agricultural land loss to the development of industrial parks, was also the one having the largest

increases in FDI employment. In Hai Duong, the proportion of employees if FDI firms was 7.6% in the enterprise census of 2002, 16.1% in the census of 2004, and 28.1 % in the census of 2006 (Enterprise Survey data, 2002/2004/2006).

Figure 1. Proportion of employees in foreign owned firms for the 2002, 2004 and 2006 censuses



Note: The Vietnamese provinces are assigned darker colors as the ratio of employees in FDI firms over the total number of employees in the surveyed firms increases. Own elaboration using the Vietnam Enterprise Surveys of 2002, 2004 and 2006.

Table 1 provides descriptive statistics on the firms surveyed by the three enterprise censuses. For each year, the first column refers to province-level averages for the whole universe of formal enterprises, while the second column refers to average values for those enterprises located in the two major cities of Hanoi and Ho Chi Minh. We adopt a relatively conservative definition of the service sector, that does not include those enterprises whose primary activity is construction, wholesale and retail sales.[6]

[6] In particular, we consider in the service sector those firms whose primary activity is: transport, post, tourism, media, ITC, finance, professional, cleaning and support services, real-estate and renting services, education, health and social services.

As expected, the overall number of firms and the number of FDI firms is much larger in the two cities. However, the increase over time in industrial presence is very similar in both the full and city sample, suggesting no increase in concentration around the main metropolis. The number of FDI firms in the service sector is very modest, even if FDI presence in this sector has been increasingly more rapidly than average. The picture is similar if we consider only foreign firms entering the market in the two years preceding the census. The entry of FDI enterprises in the service sector is proportionally greater between 2004 and 2006, with an approximate increase of four times.

Table 1. Descriptive statistics of firms in Vietnam, 2002-2004-2006 enterprise surveys

	2002		2004		2006	
	All	Hanoi & HCM	All	Hanoi & HCM	All	Hanoi & HCM
N of firms/100	9.69	119.83	13.48	193.98	20.51	293.18
	(20.68)	(35.68)	(33.00)	(61.23)	(51.79)	(106.97)
N.of FDI firms/100	0.24	3.51	0.34	4.78	0.52	6.64
	(0.87)	(2.96)	(1.21)	(3.82)	(1.72)	(4.90)
Employed FDI	127.68	1136.88	176.57	1589.33	233.34	1981.66
	(403.20)	(1453.66)	(557.37)	(1933.11)	(691.13)	(2134.47)
N. FDI in services	2.88	79.50	3.99	115.00	9.09	253.00
	(14.33)	(30.41)	(21.30)	(69.30)	(48.50)	(156.98)
FDI last 2 years	9.71	134.50	11.24	127.00	15.65	186.5
	(35.32)	(96.87)	(36.21)	(86.27)	(48.23)	(108.18)
FDI service last 2 y.	1.03	27.50	1.22	35.50	4.84	138
	(4.97)	(10.61)	(7.70)	(38.89)	(26.58)	(87.68)
Prop. State firms	0.06	0.04	0.06	0.02	0.01	0.01
	(0.18)	(0.03)	(0.21)	(0.02)	(0.01)	(0.01)
Prop. FDI	0.01	0.03	0.01	0.02	0.02	0.02
	(0.03)	(0.02)	(0.03)	(0.01)	(0.03)	(0.01)
Prop. In Services	0.17	0.24	0.16	0.26	0.16	0.29
	(0.13)	(0.00)	(0.08)	(0.00)	(0.06)	(0.01)
Turnover/1000	16.28	2.49	6.76	2.08	1.56	2.42
	(118.79)	(0.24)	(43.14)	(0.04)	(1.66)	(0.66)
Employee per firm	525.02	69.26	170.70	54.53	45.76	46.13
	(3574.77)	(7.18)	(940.77)	(3.82)	(22.70)	(5.83)
Average wages	8.57	14.34	9.45	13.26	11.06	16.49
	(3.21)	(5.54)	(2.16)	(2.17)	(2.36)	(2.44)
Wages in FDI	19.78	39.32	17.61	40.43	18.43	40.46
	(20.21)	(8.56)	(14.39)	(11.00)	(15.70)	(3.20)
Wages in Service	10.48	24.58	10.99	16.30	12.57	18.86
	(5.13)	(15.94)	(2.42)	(2.58)	(2.69)	(4.30)

Note: the statistics are province-level averages obtained from the Vietnam Enterprise Surveys of 2002, 2004 and 2006.

The introduction of the New Law on Enterprises in 1999 and of the first Competition Law of Vietnam in 2005 gave a drastic acceleration in the process of privatization (equitisation). The trend has been towards to privatization of all the small and medium State Owned Enterprises, with largest and

strategic firms remaining 100% public. WTO accession in 2007 is further accelerating the equitisation process, even if most sources agree that the objective of full public disengagement by 2010 will not be met[7].

The average size of the enterprises (as indicated by the turnover and employees per firm) was much larger outside the large cities in 2002. The trend has been towards a very marked decrease in firm size over the years, in particular in these areas. This might reflect both the higher dynamism of the private sector under the new regulations, both the higher level of formalization of small businesses (that thus are increasingly captured in the enterprise census).

Real wages at 2000 prices are consistently higher in FDI firms than in the average firm. Even if wages across all enterprises have been increasingly faster than in the FDI firms, employees in FDI seem to enjoy a very large earning premium, especially in the cities of Hanoi and Ho Chi Minh. Is this premium simply due to the fact that foreign-owned firms tend to be larger, better endowed with capital, operate in the most productive sectors or located in the richer provinces? Table 2 shows that FDI firms tend to pay more even controlling for observable differences in size, capital endowments, sector and location.

In Table 2 column 1 presents a linear regression of the logarithm of per-employee annual real wage (at 2000 prices) in 2006 on the logarithm of the number of employees, the logarithm of the capital value, 25 sector dummies[8], province of location dummies and two dummies for public and for foreign ownerships. Publicly owned firms seem to pay higher wages than privately owned firms, except when firms are foreign owned. Thus, the results of column 1 confirm that FDI firms tend to pay higher wages.

In order to assess the evolution of wage growth between domestic and foreign firms, column 2 provides a first-difference regression estimated on the panel of firms present both in the 2004 and in the 2006 enterprise census. Confirming what we observed earlier in the descriptive statistics, the wage growth between 2004 and 2006 was (slightly) lower among foreign owned firms. Interestingly, the FDI wage Premium may be declining as privatization progresses.[9]

[7] Vietnam joined the World Trade Organization (WTO) in 2007 and became its 150th member. This accession is something of an endorsement of a long process of trade reform and international integration, which started more than two decades before in 1986 with the launch of *Doi Moi* (Renovation).

[8] We summarized the 5-digit industry code of the enterprise census under the following 25 sector categories: agriculture, aquaculture, mining, food processing, textile, wood, manufacture, power, waste, construction, wholesale, retail, wholesale of textile and food, whole sale of minerals, transport, post, tourism, media, ITC, finance, professional service, renting, education, cleaning and low skill services, government, health, reparations, social services, water, sewer, other

[9] A firm is considered to be privatized if it was under ownership of the central or of the local government in 2004 and in a different ownership status (including joint public-private ownership) in 2006.

Table 2. The earning premium in FDI industries

	Log (wages/employee)	Δ Log (wages/employee)
Log (number employees)	-0.107***	
	(-0.0031)	
Log (capital)	0.194***	
	(-0.0023)	
Public owned	0.141***	
	(-0.016)	
Foreign owned	0.332***	-0.0307**
	(-0.015)	(-0.015)
Δ Log (number employees)		-0.148***
		(-0.006)
Δ Log (capital)		0.162***
		(-0.004)
Privatized		-0.109***
		(-0.016)
Constant	1.253***	0.360***
	(-0.029)	(-0.003)
Sector fixed effects	Yes	No
Province fixed effects	Yes	No
Observations	73295	73076
R2	0.363	0.043

Note: *** p<0.01, ** p<0.05, * p<0.1, Robust standard errors in parentheses. The sample is restricted to those enterprises observed both in the 2004 and in the 2006 waves of the Enterprise surveys.

Even under the unrealistic assumption that foreign-owned firms totally crowd-out local employers, the entry of FDI seems to lead to higher wage earnings. The positive correlation between FDI status and wages might be also be explained by the selective hiring of foreign enterprises, which might prefer older and more skilled workers. We conclude this overview on industrialization in Vietnam by comparing FDI firms in the service and non-service sectors. As can be seen from Table 3, foreign firms in the service sectors are smaller (lower turnover and less employees), even if the owners' capital is on average the same. FDI in services are in fact more capital-intensive (higher asset value/number of employees ratio) and tend to pay higher wages. Interestingly, both service and non-service FDI firms tend to employ more women, but the proportion of female employees is higher in non-service foreign establishments.

Table 3. Differences between service and non-service FDI firms

	Domestic firms	Service FDI	Non-service FDI
Turnover/1000	16.436	34.461	106.835
	(278.042)	(158.4768)	(473.502)
Owner's capital	5435.385	39010.76	39310.56
	(152158.9)	(244443.6)	(135049.6)
Assets/employees	335.405	4920.137	588.070
	(1718.008)	(20379.46)	(2324.935)

	Domestic firms	Service FDI	Non-service FDI
Number of employees	45.029	57.904	425.613
	(404.189)	(129.733)	(1551.718)
Proportion females	0.362	0.461	0.516
	(0.202)	(0.217)	(0.268)
Average Wages	12.571	64.252	22.074
	(12.805)	(71.887)	(42.814)

Note: Averages obtained from pooled, individual level data on establishments in the Vietnam Enterprise Surveys rounds of 2004 and 2006. Standard deviations in parenthesis.

Child labor and schooling in the industrializing Vietnam

Employment of children under the age of fifteen is illegal in Vietnam,[10] with some exceptions for children between twelve and fifteen year old where employment is restricted to a few activities specified by MOLISA's[11] circular No 21/1999/TTBLDTBXH.[12] However, there is no adequate enforcement of child labor laws, and punishment for those that infringe them is not always clearly defined. Child labor has declined very fast during the period of high economic growth of the 1990s that accompanied the reforms that started in the late 1980s. Prior to the reforms poverty was stagnant in Vietnam, but it declined significantly during the reforms, which has led some authors to believe that reforms were the main factor contributing to poverty reduction (Pham and Hoan, 2004). In any case there is substantial evidence that poor households have benefited to a large extent from the 1990s boom in Vietnam (Glewwe et al. 2002).

However, child labor is a persistent phenomenon in an economy where farming and small household enterprises still dominate the income-generating activities of the population. UNICEF reckons that around 23 percent of those children between 5 and 15 years of age were working in 1999-2004. This is double the percentage number of children working in East Asia (http://www.unicef.org/protection/files/SOWC06_Table9.pdf).[13]

Table 4 presents summary statistics for the employment of time of children aged 9 to 14 years old, for the whole population in the first column, for the lowest quintile of real expenditures in the second column, and for the highest quintile of real expenditures in the third column. Schooling attendance has increased of 3 percentages points on average between 2002 and 2006. However, the poorest quintile

[10] Vietnam was the first country in Asia to sign the International Convention on the Rights of the Child in 1990 (ILO convention 182 that replaced and strengthened the ILO convention 138 of 1973).
[11] MOLISA stands for the Ministry of Labor, War Invalid and Social Affairs.
[12] These are: acting performance, crafts and fine arts occupations (embroidering and wood carving), pottery glazing and painting, shell sawing, lacquer painting, and gifted athletes.
[13] According to UNICEF a child is considered to be involved in child labor activities when: (a) children 5 to 11 years of age did at least one hour of economic activity or at least 28 hours of domestic work during the week preceding the survey, and (b) children 12 to 14 years of age that during the week preceding the survey did at least 14 hours of economic activity or at least 42 hours of economic activity and domestic work combined.

has seen schooling participation decrease in the same period, as 18% of children from 9 to 14 were not enrolled in school in 2006. All the variables relating to labor market participation of the children show an increase between 2004 and 2002. Such an increase is surprising given that average expenditures augment over the period. The easiest explanation for such a trend is the fact that a strict legislation banned labor market participation of the children just before the survey in 2001. It is probable that the enforcement of this legislation was greater just after its approval, and that families interviewed for the 2002 survey under-declared child work for the fear of incurring sanctions. Comparing 2004 with 2006 data, the most marked decrease is the one in the activities of the children in family farming. Child labor on household enterprises and for wage earnings is minimal, while half of the children are engaged in housework. The most important point emerging from these statistics is that the further reduction in child labor in this second phase of the Vietnamese transition has not been accompanied by a proportional increase in schooling activity. The dichotomy work or study is thus overly reductive in this rapidly evolving context, where economic shocks can clearly bring children into inactivity.

Table 4. Schooling and working activities of children in Vietnam (2002-2006)

	2002			2004			2006		
	All	1st quintile	5th quintile	All	1st quintile	5th quintile	All	1st quintile	5th quintile
Attending school	0.90	0.85	0.98	0.93	0.85	0.97	0.93	0.82	0.97
	(0.30)	(0.36)	(0.14)	(0.26)	(0.36)	(0.16)	(0.25)	(0.39)	(0.17)
Working (all activities)	0.14	0.21	0.02	0.21	0.32	0.04	0.12	0.23	0.05
	(0.35)	(0.41)	(0.16)	(0.41)	(0.47)	(0.21)	(0.33)	(0.42)	(0.22)
Hours of work	3.01	4.50	0.49	3.51	5.63	0.67	2.16	4.42	0.94
	(9.12)	(10.56)	(4.11)	(8.74)	(10.37)	(3.92)	(7.19)	(10.04)	(4.80)
Agricultural work	0.12	0.19	0.02	0.19	0.30	0.03	0.11	0.22	0.04
	(0.32)	(0.39)	(0.12)	(0.39)	(0.46)	(0.17)	(0.32)	(0.41)	(0.20)
Work for wage	0.02	0.03	0.00	0.02	0.02	0.00	0.01	0.01	0.01
	(0.14)	(0.16)	(0.07)	(0.13)	(0.13)	(0.03)	(0.12)	(0.11)	(0.08)
Work for family business	0.02	0.01	0.01	0.02	0.01	0.02	0.01	0.00	0.01
	(0.12)	(0.12)	(0.08)	(0.13)	(0.10)	(0.13)	(0.09)	(0.07)	(0.07)
Work at home	0.44	0.50	0.28	0.54	0.61	0.44	0.50	0.55	0.41
	0.50)	(0.50)	(0.45)	(0.50)	(0.49)	(0.50)	(0.50)	(0.50)	(0.49)

Note: Statistics refer to children ages 10-14, younger than the legal working age since 2001. Quintiles are based on the distribution of per-capita real expenditures in food and non-food items. Own calculation from Vietnam VHLSS data for 2002, 2004 and 2006.

Since the youngest tend to supply labor for family activities, important complementarities or substitution effects can link the work of the children with the one of teenagers within the household. It is thus important to give a comparative look at the employ of time of young aged from 15 (the minimum legal age for working) to 19, age at which most young tend to leave the household. We do it in table 5. The discrepancies between rich and poor households are extremely large. School attendance for the young in the poorest quintile never exceeded the 40%, while in the richest quintile was twice as

high in 2002. Interestingly, there has been a decrease in schooling attendance for the richest group, at least partly in response to the greater demand for their work for family activities. In fact, the increase in the supply of labor for farming has been greater than the parallel increase in the supply of labor for wage. The increased demand for young labor within the household is confirmed by their greater engagement in house works (cleaning, cooking…).

Table 5. Schooling and working activities of teenagers (15-19 years old) in Vietnam

	2002			2004			2006		
	All	1st quintile	5th quintile	All	1st quintile	5th quintile	All	1st quintile	5th quintile
Attending school	0.54	0.37	0.80	0.56	0.40	0.72	0.57	0.39	0.68
	(0.50)	(0.48)	(0.40)	(0.50)	(0.49)	(0.45)	(0.50)	(0.49)	(0.47)
Working (all activities)	0.51	0.70	0.18	0.53	0.76	0.26	0.44	0.71	0.26
	(0.50)	(0.46)	(0.38)	(0.50)	(0.43)	(0.44)	(0.50)	(0.45)	(0.44)
Hours of work	16.45	22.34	6.42	15.07	20.77	7.96	13.37	20.09	8.49
	(19.43)	(18.73)	(15.56)	(18.12)	(16.01)	(16.63)	(18.42)	(17.10)	(16.84)
Agricultural work	0.37	0.58	0.07	0.43	0.68	0.15	0.33	0.66	0.17
	(0.48)	(0.49)	(0.26)	(0.50)	(0.47)	(0.35)	(0.47)	(0.48)	(0.37)
Work for wage	0.19	0.25	0.07	0.19	0.22	0.10	0.17	0.16	0.11
	(0.39)	(0.43)	(0.25)	(0.40)	(0.41)	(0.31)	(0.37)	(0.36)	(0.32)
Work for family business	0.07	0.05	0.06	0.05	0.05	0.05	0.04	0.02	0.04
	(0.25)	(0.22)	(0.25)	(0.22)	(0.21)	(0.22)	(0.20)	(0.15)	(0.20)
Work at home	0.59	0.65	0.49	0.69	0.77	0.59	0.68	0.77	0.60
	(0.49)	(0.48)	(0.50)	(0.46)	(0.42)	(0.49)	(0.47)	(0.42)	(0.49)
hourshome	7.70	8.31	6.38	7.71	8.82	6.41	7.40	8.92	6.69
	(8.33)	(8.07)	(8.45)	(7.06)	(6.98)	(7.00)	(6.92)	(7.42)	(7.02)

Note: Statistics refer to young aged 15-19, younger than the legal working age since 2001. Quintiles are based on the distribution of per-capita real expenditures in food and non-food items. Own calculation from Vietnam VHLSS data for 2002, 2004 and 2006.

Other characteristics beside family's income can be important in determining whether children work or not. In table 6, we provide descriptive data on characteristics of families having children under 15 years, disaggregated by working status of the children. As it can be seen, families with working children are larger, are more likely to come from ethnic minorities, and have significantly lower income. There are less families with working children in which the household head is engaged in service-related occupations, and, as expected, child labor is strongly negatively correlated with the education of the household head.

Table 6. Child Labor and Household Characteristics (2006).

	No working child	Having working child	Total
Household size	4.82	5.51	4.87
Fraction of children under 16 year olds	0.36	0.42	0.36
Fraction of people older 60 year olds	0.06	0.04	0.06
Age of head	45.56	44.21	45.46
Ethnic minorities (yes=1)	0.13	0.40	0.15
Living in urban (yes=1)	0.26	0.07	0.25
Income per capita (thousand VND)	7830.60	4682.37	7612.84
Expenditure per capita (thousand VND)	5604.40	3331.11	5447.16
		Having working	
Head occupation	No working child	child	Total
Leaders/Managers	2.44	1.74	2.39
Professionals/Technicians	4.97	0.39	4.65
Clerks/Service Worker	3.69	2.17	3.58
Agriculture/Forestry/	45.31	70.63	47.06
Skilled Workers/Machinery	14.31	8.86	13.93
Unskilled Workers	18.15	10.61	17.63
Not working	11.13	5.6	10.75
		Having working	
Education of head	No working child	child	Total
< Primary	24.43	42.79	25.7
Primary	26.23	24.62	26.11
Lower-secondary	26.74	25.22	26.63
Upper-secondary	8.49	3.99	8.18
Technical degree	9.43	3.38	9.01
Post-secondary	4.69	0	4.36
Number of obs	5,109	443	5,552

Note: Authors' calculation with VHLSS 2006 data.

In situations when the demand for offsprings' labor increases, strategic choices might be made within the household over which child should leave school or supply extra hours of work. Gender might represent an important discriminatory factor in such strategic choices. As it is shown by the two sides of the bell in figure 2a, there is no large difference on average in the enrollment of boys and girls.

Figure 2a. Enrollment in school by age and gender, full sample (2006)

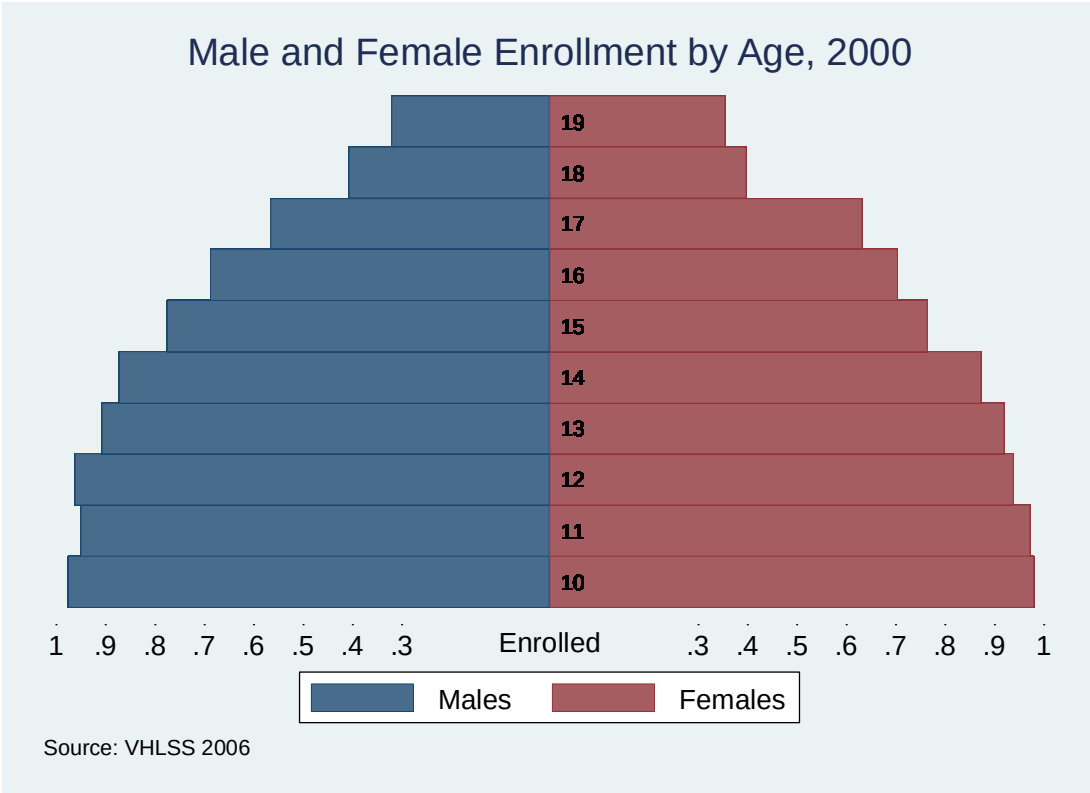
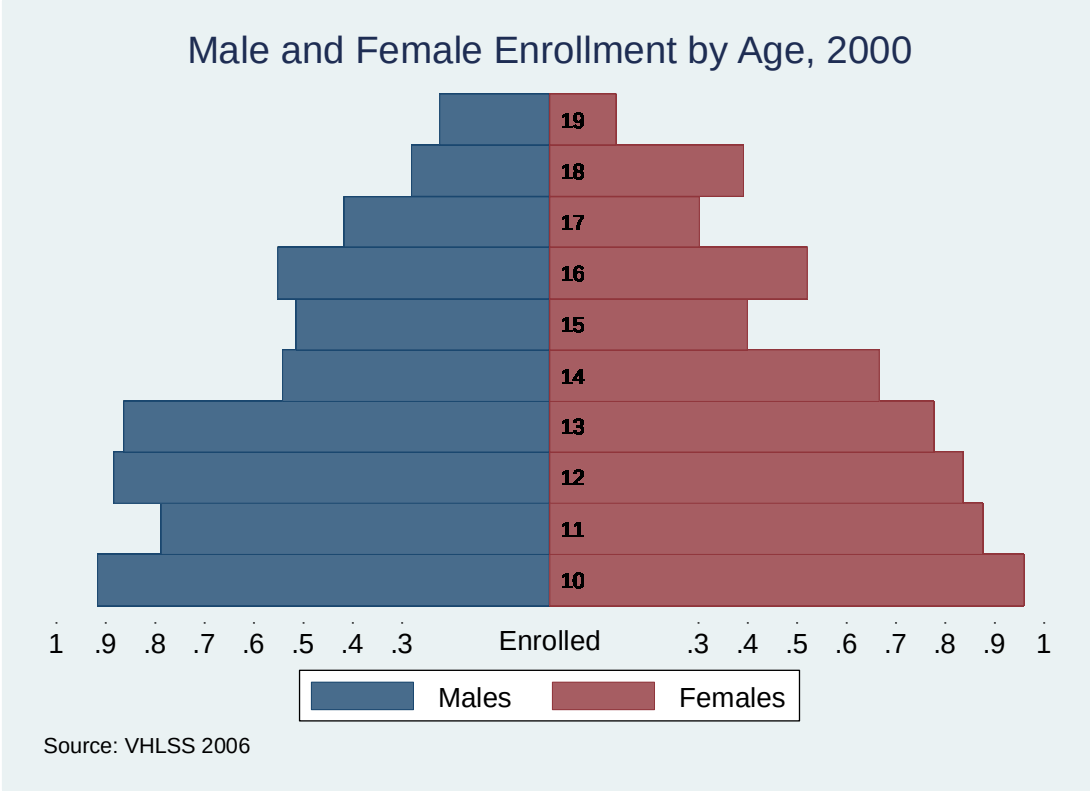


Figure 2b. Enrollment in school by age and gender, lowest expenditure quintile (2006)

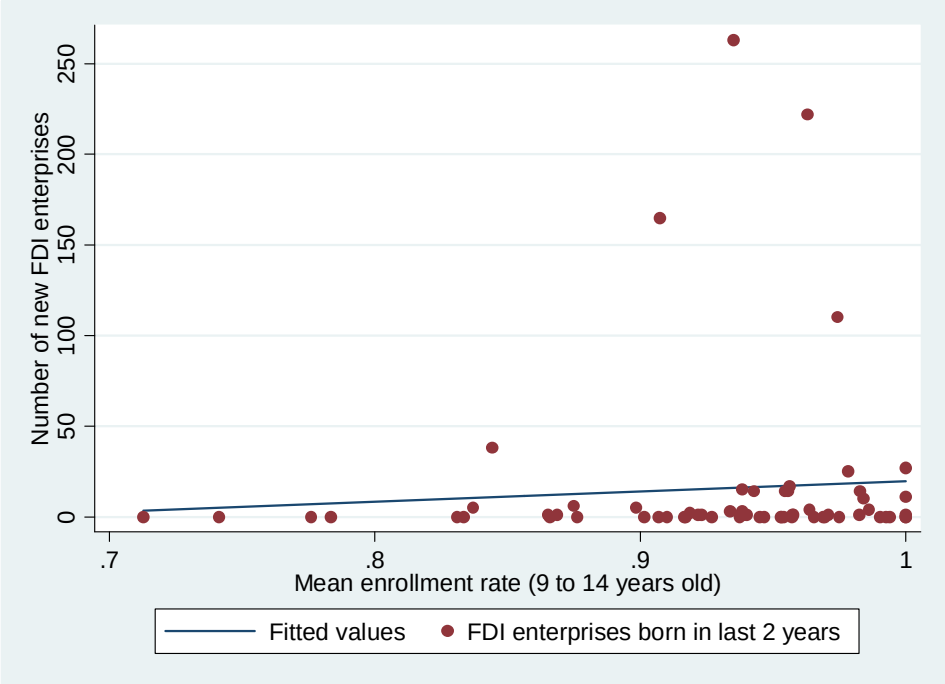


As shown in figure 2b, the picture gets considerably more complicated when one focuses the observation on the poor. We can see large discontinuities in enrollment, with many boys from poor families leaving school at the age of 14, and many girls at the age of 15. Interestingly, enrolment seems to increase again for girls at the age of 16, probably indicating that there are many transitions into and out of school as young adjust to income shocks or to changes in local labor markets.

4. Industrialization, FDI and children employment. Methodology and Empirical results

In this section we explore the causal relationship between FDI and the way children spend their time. The scatter plot of figure 3a shows a positive relationship linking the entry of new FDI enterprises and the enrollment rate of children at the level of Vietnamese provinces. Such a positive relationship seems however mainly driven by few outliers, namely the provinces of Ho Chi Minh cities, Binh Duong and Dong Nai in the South-East region, and the province of Hanoi in the Red River Delta.

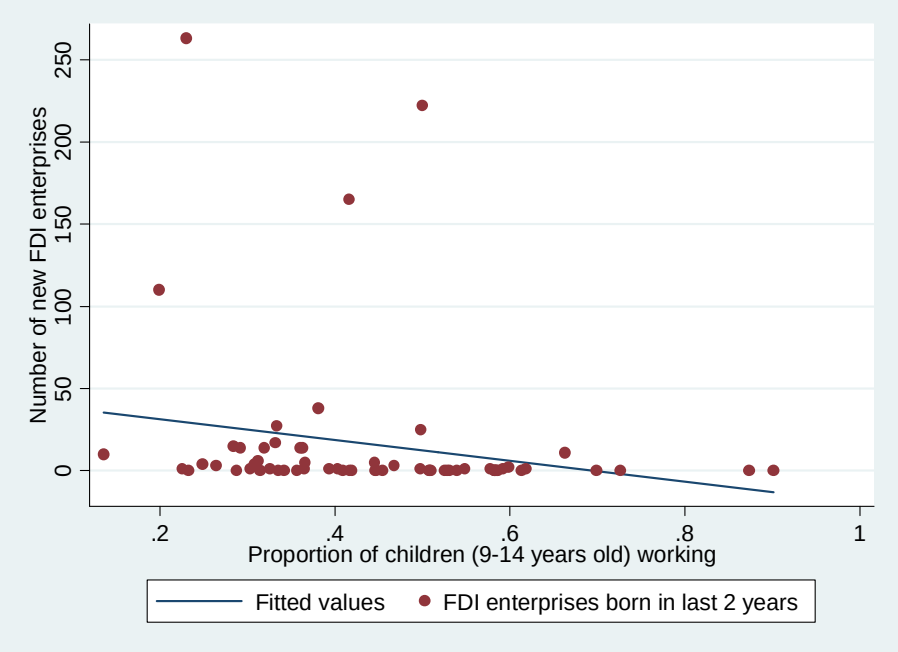
Figure 3a. FDI creation and mean enrollment rates (2006)



Note: Red spots indicate vietnamese provinces. The data refer to 2006. Number of new FDI enterprises is the count, for each province, of foreign-owned enterprises created in 2005 and 2006.

A similar picture emerges if one looks at the raw correlation between proportion of working children and the number of newly established FDI firms (figure 3b). FDI entry is negatively correlated with child labor, but the relationship becomes less clear once one excludes the richest and most urbanized provinces.

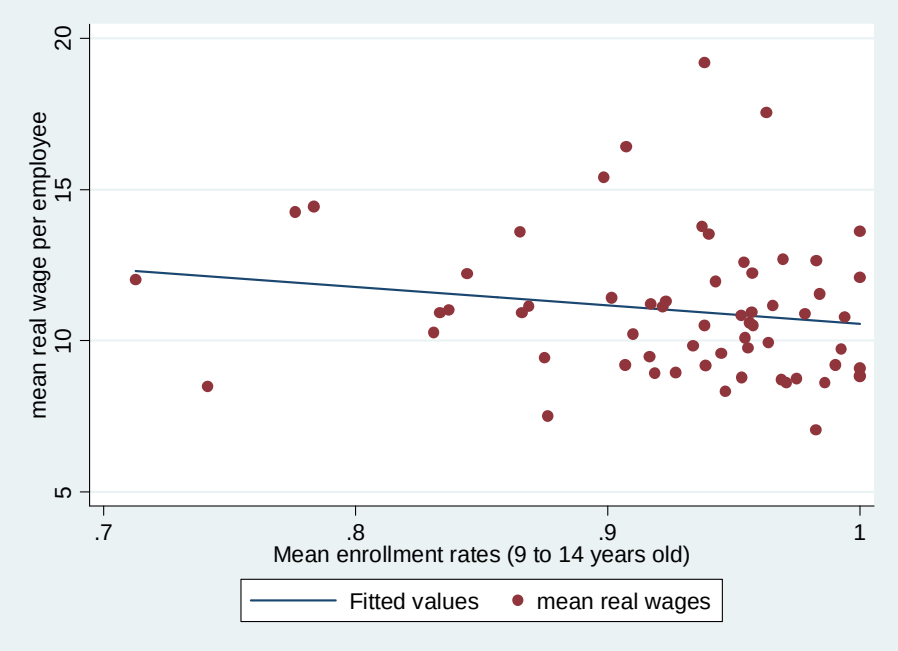
Figure 3b. FDI creation and working status



Note: Red spots indicate vietnamese provinces. The data refer to 2006. Number of new FDI enterprises is the count, for each province, of foreign-owned enterprises created in 2005 and 2006.

Figure 3c shows the raw correlation between the mean wages earned in the census enterprises and the enrollment rates in the provinces. Interestingly, the linear plot shows a negative relation, as if schooling participation of children decreases with increasing wages. The positive income effect of FDI might thus fail to translate in higher enrollments of children.

Figure 3c. Wages and working status



Note: Red spots indicate Vietnamese provinces. The enrollment data refer to the 2006 VHLSS. The variable of the vertical axis are province-averages of wages per employee, as calculated from the 2006 Enterprise survey, at 2000 prices.

In order to move beyond simple correlations that suffer from omitted variable bias, selection and other statistical problems, we follow a straightforward empirical strategy. We correlate change in FDI entries between 2002 and 2006 with changes in child labor. We use the detailed household data available to control for household and child characteristics, but the fundamental variation used to identify the impact of FDI is at the province level. Our basic specification is given by:

$$\ell_{c,h,p,t} = \alpha_p + \alpha_t + \beta FDI_{p,t\&t-1} + \gamma NOTFDI_{p,t\&t-1} + \lambda \mathbf{H_{c,p,t}} + \delta \mathbf{C_{h,p,t}} + \theta M_{m/p,t} + \mu_{c,h,m,p,t} \qquad (1)$$

where $\ell_{c,h,m,t}$ is either an indicator of the participation in the labor market by child *c* of household h living in commune *m* of province *p* at time *t*. We use a dichotomous variable to capture the child's participation in the labor market. The variable takes the value 1 if he or she works, and 0 otherwise. *FDI* captures the number of entries by foreign firms in the province at year *t* and at *t-1*. We are mainly interested in the effect of new FDI investments in the service sector, but we test separately the impact of FDI in the service sector and in the manufacturing sector. *NOTFDI* indicates the number of Vietnamese-owned firms created at year *t* and at *t-1*, and is a proxy for the process of domestic industrialization, advancing at different speeds in the different provinces. *H* is a matrix of household characteristics such as income and household head education. The *H* matrix also includes variables on the number of hours worked by household members older than the children, to capture possible substitution and complementarities in labor supply within the family. *C* is a matrix of child's characteristic such as gender and age. *M* is a matrix of province and community characteristics, i.e. the rural or urban status of the commune and the share of households employed in agriculture in the commune, the proportion of firms in service sectors in the province, the average real wage of workers in the province's enterprises.μ is an error term. Because the left-hand-side variable is dichotomous, we use a logit estimator.

A positive β will indicate that the higher is the entry of FDI firms in the province the largest is child labor participation, which would confirm the view of globalization critics. A negative coefficient will suggest that FDI help to reduce child labor. We are particularly interested in comparing the sign of β and γ, to explore whether the demand for labor by foreign owned firms have a different effect than the demand from domestic firms on the way children employ their time.

We also explore whether different types of FDI may lead to different outcomes. Is FDI in manufacturing different from FDI in services when it comes to their impact on child labor? The impact of FDI on child labor may also depend on whether domestic firms are in the manufacturing or

services sectors, as this may affect the scope for displacement, in particular if manufacturing firms are exporting to OECD countries where consumer activism may hurt them if they employ child labor. [14] Results are displayed in table 7 and in table 8.

In the first column of table 7, we pool the individual data from 2002, 2004 and 2006 and we regress the binary variable on child labor ("*Working*") on the number of new FDI firms in service in the province, and the individual, family and community characteristics explained above. In this pooled regression without province fixed effects, child labor and the number of service FDI firms in the province are positively correlated. As expected, child labor is more prevalent in communities with a larger share of household engaged in agricultural activities. Richer and more educated families have a significantly lower participation of children in the labor market. There is a significant gender bias, with female children supplying more labor. Interestingly, while larger families tend to have more children working, the propensity of children to work decreases with the number of teenagers (15-19) in the household. This might indicate that child labor is a last-resort for families experiencing increases in the demand for labor. Families first expand the supply of labor of the young and only if further labor-constrained decide to engage children below the legal working age. Controlling for real expenditures per-capita, child labor decreases with higher labor participation of adult household members (hours worked by 21-65 years old individuals), but increases with hours worked of the teenagers. The latter result might reinforce the intuition of complex within-household interactions in labor supply, with families recurring to child labor when they have exhausted the availability of labor supply of older kids.

The positive correlation between FDI in service and child labor in (1) might be spurious, due to excluded province characteristics, most notably the degree of industrialization of the province. As already said, rapid industrialization might move a high number of family members from farms and home workshops into factory work, possibly increasing the demand for child labor for family farming and other household activities. In column 2, we add a variable proxying the intensity of industrialization in the province, i.e. the number of new enterprises created at *t and t-1*. We can see that our proxy for the entry of service FDI firms changes sign, becoming negatively correlated with child labor, even if the variable is statistically significant only at the 15% level. Interestingly, the entry of non-fdi firms is positively correlated with child labor and strongly statistically significant.

Other observed and unobserved province characteristics might affect the correlation between FDI and child labor. The estimation in (2) will thus be biased if there is selection into provinces by FDI firms which may select locations with characteristics correlated with child labor, e.g. good quality

[14] For example, the United States Trade and Development Act of 2000 restricts eligibility of GSP benefits to countries that the Secretary of Labor certifies as showing progress to eliminate the worst forms of child labor.

infrastructure or population density. Another source of selection bias might be regional development policies which may drive location of foreign firms in particular regions.

The availability of data over multiple years allows us to add province fixed-effects that capture observed and unobserved heterogeneity among provinces. As long as these unobservable determinants of firm location, correlated with child labor, are invariant during the 2002-2006 period, the inclusion of province fixed effects reduces the possible bias due the endogenous sorting of enterprises. In column (3), we can see that in a model with province fixed effects the entry of FDI firms in the service sector reduces the likelihood of child labor. The coefficient is greater in size and statistically significant at the 1% level, suggesting that unobservable province characteristics were biasing the effect downwards in specifications (1) and (2). In column (3) we also include the number of FDI entries in non-service sectors (mostly manufacturing and mining), and we find that also this type of foreign investment tends to reduce the likelihood of child labor. While the coefficient on manufacturing FDI is less than half the size of the coefficient of service FDI, there are 5 times less foreign-owned firms in the service sector.

This means that the effect of FDI in manufacturing on child labor is greater than the impact of FDI in services. This finding might be explained by the fact that provinces with higher incidence of child labor were less succesful in attracting the relatively skill-intensive service sector investments. As we saw before, more traditional FDI (textile, mining, food processing) had instead been spreading more equally over the Vietnamese territory, touching also those provinces with larger and more rapidly decreasing rates of child labor. However, the province and the year fixed effects should, at least partly, control for these province-specific trends in child labor. Other explanations thus deserve mention. One is the higher capital intensity of the current FDI investments in the service sector. A more intruiguing story is that an higher share of FDI firms in manufacturing might serve international markets, and thus be more exposed to consumer boycotts sanctioning child labor in developed countries.

In the regression with province fixed effects, we generally find that increases in the overall proportion of firms (both FDI and domestic) in the service sector lead to a lower incidence of child labor. This finding can be explained by the relative skill intensity of service industries with respect to the mining, agricultural processing and manufacturing industries in Vietnam. In column (4) we add as an additional regressor the average wage in the provinces' enterprise surveyed in the census. The idea is to check whether the main channel driving the negative correlation between FDI and child labor is the "earning effect", described in the previous section. Interestingly, the wage variable is not significant when included together with the FDI variable. This suggests that other channels might be more important in explaining the main finding, most likely the fact that FDI industries increase the demand for skilled labor and provide more secure, high-quality jobs. The positive link between a rapid domestic industrialization process (proxied by the increase in non-FDI firm creation) and child labor

deserves further reflections. Given that child labor is concentrated in agriculture and household activities, a-priori one would expect that a rapid diversification out of agriculture into wage labor would decrease the frequency of labor market participation of the children. Things might work differently if labor market imperfections generate a positive association between industry creation and unemployment. As the expected earnings in industry are much greater than the earnings in agriculture, labor market incumbents (and young in particular) might be ready to leave agricultural work even at a high risk of transitory unemployment. These transitions of the young out of agriculture are highly relevant in our data (10 % decrease in agricultural partecipation of the 14-19 years old between 2004 and 2006), probably much higher than the absorption capacity of the new firms. Shocks associated to transitory unemployment, and the parallel higher demand for child work due to young leaving the household farm, might be particularly relevant for poor households. In fact, after more than 15 years of sustained growth, child labor seems mainly to persist in poor households exposed to negative income fluctuations. To explore this hypothesis, in column (5) we interact the number of new, non-fdi enterprises with the logarithm of real per capita expenditure of the household. The interaction term is negative and strongly statistically significant, indicating that the industrial transition is more likely to induce higher child labor in poorer households. Interestingly, the interaction between expenditures and FDI entries is not statistically significant (result not shown). Succesful attraction of FDI seems to partially compensates possible adjustment effects of rapid industrialization on child labor.

Table 7. Entry of FDI firms in the service sector and working status of the children

	Working (1) *Logit*	Working (2) *Logit*	Working (3) *Logit*	Working (4) *Logit*	Working (5) *Logit*
FDI service	0.0072***	-0.0062	-0.0259***	-0.0176***	-0.0155**
	(-0.002)	(-0.004)	(-0.006)	(-0.006)	(-0.006)
Domestics firms		0.0002***	0.0007***	0.0006***	0.0019***
		(0.00004)	(0.0001)	(0.0001)	(-0.001)
FDI manufacturing			-0.0116***		
			(-0.003)		
Wage per worker				-0.002	-0.0012
				(-0.026)	(-0.026)
Domestic*Log Expenditures					-0.0002***
					(0.00001)
Proportion in agriculture	5.2732***	5.2857***	4.7769***	4.7866***	4.7914***
	(-0.121)	(-0.124)	(-0.147)	(-0.147)	(-0.147)
Urban	0.1681***	0.1590***	0.0741	0.0842	0.0877
	(-0.055)	(-0.055)	(-0.06)	(-0.06)	(-0.059)
Male	-0.1406***	-0.1488***	-0.1440***	-0.1414***	-0.1416***
	(-0.033)	(-0.033)	(-0.034)	(-0.034)	(-0.034)
Hours worked by teens	0.0214***	0.0213***	0.0218***	0.0218***	0.0218***
	(-0.001)	(-0.001)	(-0.001)	(-0.001)	(-0.001)
Hours worked by adult	-0.0028***	-0.0029***	-0.0024***	-0.0024***	-0.0025***
	(-0.001)	(-0.001)	(-0.001)	(-0.001)	(-0.001)

	Working (1) *Logit*	Working (2) *Logit*	Working (3) *Logit*	Working (4) *Logit*	Working (5) *Logit*
Number of children	0.1812***	0.1634***	0.1375***	0.1378***	0.1364***
	(-0.025)	(-0.026)	(-0.027)	(-0.027)	(-0.027)
Number of teens	-0.5239***	-0.5178***	-0.5275***	-0.5260***	-0.5265***
	(-0.036)	(-0.036)	(-0.037)	(-0.037)	(-0.037)
Age	0.5197***	0.5213***	0.5484***	0.5477***	0.5475***
	(-0.013)	(-0.013)	(-0.013)	(-0.013)	(-0.013)
Household size	0.0415***	0.0443***	0.0455***	0.0447***	0.0464***
	(-0.015)	(-0.015)	(-0.016)	(-0.016)	(-0.016)
Education of the head	-0.0527***	-0.0543***	-0.0862***	-0.0861***	-0.0866***
	(-0.005)	(-0.005)	(-0.006)	(-0.006)	(-0.006)
Proportion of firms in service	0.1508	-0.045	-1.6223**	-1.6272**	-1.4489*
	(-0.271)	(-0.279)	(-0.821)	(-0.819)	(-0.821)
Log Expenditure	-0.3613***	-0.3549***	-0.4162***	-0.4178***	-0.3613***
	(-0.041)	(-0.042)	(-0.048)	(-0.048)	(-0.051)
2004	0.5989***	0.5968***	0.6084***	0.5879***	0.5817***
	(-0.041)	(-0.042)	(-0.045)	(-0.057)	(-0.056)
2006	0.2661***	0.2641***	0.1564***	0.1333	0.1101
	(-0.046)	(-0.045)	(-0.056)	(-0.095)	(-0.095)
Constant	-7.9947***	-8.0509***	-8.8021***	-9.1830***	-10.0083***
	(-0.389)	(-0.393)	(-1.005)	(-1.035)	(-1.064)
Province Fixed effects	No	No	Yes	Yes	Yes
Observations	36295	35923	35923	35923	35923
Pseudo R-squared	0.22	0.21	0.25	0.25	0.25

Note: *** p<0.01, ** p<0.05, * p<0.1 Robust standard errors in parentheses. The sample is made of pooled data for 2002, 2004, 2006 on all the children aged 9-14. *FDI service*, *Domestic Firms and FDI manufacturing* are counts of enterprises starting operation in the province at *t* and *t-1*.

In table 7a we test the robustness of our results using different measures of child labor. In column 1, we estimate a tobit model on the number of hours worked per week by the children, finding again a significant negative correlation with the entry of foreign firms in the service sector. In column 2, 3 and 4, we regress binary variables equal to 1 if the child is respectively engaged in agricultural work, domestic work, and work for a household enterprise, 0 otherwise. The results discussed above are confirmed.

Table 7a. Entry of FDI firms in the service sector and type of working activity of the children

	Hours worked (1) Tobit	Work in family agriculture (2) Logit	Work for wage (3) logit	Work for family business (4) logit
Service FDI	-0.2155**	-0.0161*	-0.0076**	-0.0238*
	(-0.089)	(-0.0083)	(-0.0032)	(-0.014)
Domestic Firms	0.0072***	0.0006***	0.0003***	0.0010**
	(-0.002)	(-0.0002)	(-0.0001)	(-0.0004)
Wage per worker	0.1294	-0.0487*	-0.0428**	0.1049
	(-0.374)	(-0.0276)	(-0.0178)	(-0.0903)

	Hours worked	Work in family agriculture	Work for wage	Work for family business
	(1)	(2)	(3)	(4)
	Tobit	Logit	logit	logit
Proportion in agriculture	57.3150***	5.9448***	0.5872***	-1.7990***
	(-1.934)	(-0.1593)	(-0.0913)	(-0.3376)
Urban	0.831	0.0947	-0.1392***	-0.2122
	(-0.84)	(-0.0662)	(-0.0354)	(-0.1511)
Male	-1.8745***	-0.0662*	-0.5502***	-0.5793***
	(-0.482)	(-0.0368)	(-0.0234)	(-0.0962)
Hours worked by teens	0.3864***	0.0174***	0.0024***	0.0181***
	(-0.017)	(-0.0011)	(-0.0008)	(-0.0024)
Hours worked by adult	-0.0015	-0.0042***	-0.0013***	0.0043***
	(-0.008)	(-0.0006)	(-0.0004)	(-0.0016)
Number of children	2.0847***	0.1019***	0.0788***	0.2960***
	(-0.383)	(-0.0287)	(-0.0192)	(-0.082)
Number of teens	-8.9568***	-0.4666***	-0.2111***	-0.0928
	(-0.549)	(-0.0387)	(-0.024)	(-0.0998)
Age	8.2376***	0.5130***	0.3790***	0.4754***
	(-0.194)	(-0.0143)	(-0.0086)	(-0.0362)
Household size	0.2379	0.0881***	-0.0928***	-0.2080***
	(-0.225)	(-0.0175)	(-0.0113)	(-0.0539)
Education of the head	-1.3432***	-0.0803***	-0.0138***	-0.0723***
	(-0.085)	(-0.0066)	(-0.0041)	(-0.0148)
Proportion of firms in service	-23.1078*	0.1771	-1.9300***	-4.8302**
	(-11.818)	(-0.9064)	(-0.5323)	(-2.4407)
Log Expenditure	-7.0218***	-0.3599***	-0.3100***	-0.0975
	(-0.695)	(-0.0519)	(-0.0306)	(-0.126)
2004	6.4840***	0.7171***	0.3996***	-0.0508
	(-0.817)	(-0.0611)	(-0.0402)	(-0.1575)
2006	-0.2292	0.4420***	0.3531***	-1.3767***
	(-1.384)	(-0.1022)	(-0.065)	(-0.3079)
Constant	-120.2514***	-9.8100***	-1.4915***	-14.2584***
	(-14.225)	(-1.2106)	(-0.5722)	(-3.0974)
Province fixed effects	Yes	Yes	Yes	Yes
Observations	35923	35923	35923	32131
Pseudo R-squared	0.0996	0.278	0.125	0.142

Note: *** p<0.01, ** p<0.05, * p<0.1 Robust standard errors in parentheses. The sample is made of pooled data for 2002, 2004, 2006 on all the children aged 9-14. *FDI service*, *Domestic Firms* are counts of enterprises starting operation in the province at *t* and *t-1*.

A relevant objection to the results above is that they show that child labor tends to decrease with higher FDI entries, but they do not imply that children substitute working with higher schooling. In fact, children might simply stop working, and spend more time in the playground. Table 8 inspects whether FDI entry in the service sector is also accompanied with higher schooling, and thus life-time improvements in capabilities of the young. We adopt the same specification of the model in equation (1) with, as a dependent variable, a dummy taking the value if those in schooling age (6 to 19 years old) are currently attending

school, 0 otherwise. Column (1) replicates our specification with province fixed effects, showing that schooling rates increase with the entry of FDI firms in the service sector, and decrease with the entry of Vietnamese enterprises. In column (2), we find that the positive effect of FDI in service is decreasing with the age of the young, most likely because some older teenagers are likely to search for employment in FDI enterprises. In column (3), the interaction between service FDI entry and log expenditure is not statistically significant. In column (4), we can see that the positive effect of FDI entry is greater on the schooling enrollment of girls. In column (5), we interact the entry of Vietnamese firms with the log of real expenditures per capita, finding again that the negative effect is concentrated on low-income households.

Table 8. Entry of FDI firms in the service sector and schooling enrollments

	Attending school (1) *Logit*	Attending school (2) *Logit*	Attending school (3) *Logit*	Attending school (4) *Logit*	Attending school (5) *Logit*
FDI in service	0.0084***	0.0238***	0.0257*	0.0108***	0.0091***
	(-0.003)	(-0.009)	(-0.014)	(-0.003)	(-0.003)
Domestic firms	-0.0003***	-0.0003***	-0.0003***	-0.0003***	0.00008
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
FDI service*age		-0.0010*			
		(-0.001)			
FDI service*expenditures			-0.0019		
			(-0.002)		
FD serviceI* male				-0.0043**	
				(-0.002)	
Domestic firms*expend.					-0.00001**
					(0.000006)
Wages	-0.0972***	-0.0971***	-0.0973***	-0.0973***	-0.0973***
	(-0.016)	(-0.016)	(-0.016)	(-0.016)	(-0.016)
Proportion agriculture	-1.1532***	-1.1517***	-1.1506***	-1.1527***	-1.1496***
	(-0.082)	(-0.082)	(-0.082)	(-0.082)	(-0.082)
Urban	-0.0423	-0.0421	-0.0409	-0.0424	-0.04
	(-0.033)	(-0.033)	(-0.033)	(-0.033)	(-0.033)
Male	0.1563***	0.1561***	0.1563***	0.1632***	0.1564***
	(-0.021)	(-0.021)	(-0.021)	(-0.021)	(-0.021)
Hours worked by adults	-0.0029***	-0.0030***	-0.0030***	-0.0030***	-0.0030***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Number of children	-0.1298***	-0.1300***	-0.1297***	-0.1298***	-0.1298***
	(-0.016)	(-0.016)	(-0.016)	(-0.016)	(-0.016)
Number of teens	-0.1217***	-0.1224***	-0.1219***	-0.1218***	-0.1222***
	(-0.017)	(-0.017)	(-0.017)	(-0.017)	(-0.017)
Age	-0.5658***	-0.5644***	-0.5658***	-0.5659***	-0.5659***
	(-0.006)	(-0.006)	(-0.006)	(-0.006)	(-0.006)
Household size	0.0662***	0.0664***	0.0664***	0.0665***	0.0668***
	(-0.01)	(-0.01)	(-0.01)	(-0.01)	(-0.01)
Education of the head	0.1352***	0.1353***	0.1352***	0.1352***	0.1351***

	Attending school (1) *Logit*	Attending school (2) *Logit*	Attending school (3) *Logit*	Attending school (4) *Logit*	Attending school (5) *Logit*
	(-0.004)	(-0.004)	(-0.004)	(-0.004)	(-0.004)
Proportion of service	0.4013	0.4046	0.4121	0.4004	0.4387
	(-0.477)	(-0.477)	(-0.477)	(-0.477)	(-0.477)
Expenditures	1.2337***	1.2338***	1.2386***	1.2345***	1.2520***
	(-0.03)	(-0.03)	(-0.03)	(-0.03)	(-0.032)
2004	-0.0671*	-0.0671*	-0.0679*	-0.0672*	-0.0692*
	(-0.036)	(-0.036)	(-0.036)	(-0.036)	(-0.036)
2006	-0.1783***	-0.1783***	-0.1810***	-0.1786***	-0.1852***
	(-0.057)	(-0.057)	(-0.057)	(-0.057)	(-0.057)
Constant	1.5634***	1.5613***	1.4717***	1.5404***	1.3394**
	(-0.519)	(-0.522)	(-0.525)	(-0.519)	(-0.531)
Province fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	79459	79459	79459	79459	79459
Pseudo R-squared	0.342	0.342	0.342	0.342	0.342

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. The sample is made of pooled data for 2002, 2004, 2006 on all the individuals aged 6 to 19 years old. *FDI service*, *Domestic Firms* are counts of enterprises starting operation in the province at *t* and *t-1*.

A subsample of the families is followed over the three waves of the surveys. We can thus test whether our main result on child labor holds when controlling for household fixed effects. The advantage of including the fixed-effect at the household level is that we can control for some crucial unobservable characteristics, such as family-specific degree of aversion to child labor or exposure to risk. However, there are notable problems with the household fixed effect model. The main one is that there is much less variation in child labor participation within the household, as many families might not have children in the relevant age range (10-14) in the three waves. One consequence is that the overall fit of the model is much worse and few variables are significant. Another important problem of the household-fixed effect specification is that attrition is likely to be non-random, those households disappearing from the panel being more likely to have moved to provinces with better living or earning conditions. Keeping in mind these limitations, we display the results in table 9. As can be seen in column (1), the signs on Service FDI and Non-FDI firms confirm the results previously discussed, but are not statistically significant as most of the other variables. In column (2), we restrict the sample to girls. The statistical significance increases, suggesting again that changes in demand for labor are more likely to affect the participation of female.

Table 9. Entry of FDI and child labor. Household fixed-effect estimation

	Working (1) OLS fixed effects	Working (Girls Only) (2) OLS fixed effects
Service FDI	-0.0009	-0.0033*
	(-0.001)	(-0.002)
Domestic firms	0.00001	0.0001*
	(0.00001)	(0.00007)
Proportion in agriculture	0.6572***	0.6946***
	(-0.078)	(-0.122)
Male	-0.0187	
	(-0.013)	
Hours worked by teens	0.0009*	0.0020***
	(-0.001)	(-0.001)
Hours worked by adults	-0.0003	-0.0004
	(0.0002)	(0.0003)
Number of children	0.0239*	0.0057
	(-0.013)	(-0.019)
Number of teens	0.0125	-0.0192
	(-0.017)	(-0.026)
Age	0.0600***	0.0599***
	(-0.004)	(-0.006)
Household size	-0.0073	-0.0066
	(-0.012)	(-0.017)
Proportion of service	0.004	0.1499
	(-0.279)	(-0.454)
Expenditures	0.0322	0.0587
	(-0.027)	(-0.04)
2004	0.0413***	0.0242
	(-0.016)	(-0.024)
2006	-0.0483*	-0.0701
	(-0.026)	(-0.043)
Constant	-1.1012***	-1.3097***
	(-0.244)	(-0.348)
Household fixed effects	Yes	Yes
Observations	15875	7749
R-squared	0.1211	0.1172
Number of household fixed effects	4438	2659

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. *FDI service*, *Domestic Firms* are counts of enterprises starting operation in the province at *t* and *t-1*.

V. Conclusions

This paper studies whether Vietnamese openness to foreign direct investment in the service sector has affected the labor supply of children. We find reassuring evidence that the entry of foreign owned firms is associated to a lower propensity of children to work, and to higher rates of enrollment in school. Contrary to the view of globalization critics, FDI seems to improve

working conditions in a rapidly industrializing economy like Vietnam, with general welfare improvements that translate into greater investments in the human capital of the younger. FDI in services seems to have a lower impact on the reduction of child labor than FDI in other sectors. This is probably due to the fact that, until 2006, the last year covered by our data, the entry of foreign enterprises in the service sector was limited and characterized by a high degree of capital intensity. The fact that manufacturing firms may be more easily targeted by trade policy in the rest of the world or consumer boycotts associated with child labor might also explain the larger effect of FDI in manufacturing.

Our finding is particularly relevant given that the very domestic industrialization process is leading to dramatic adjustments in labor market participation and activities of Vietnamese households. While the persistence of child labor in the industrializing Vietnam deserves further monitoring, the current acceleration of trade liberalization in services is unlikely to represent a severe threat to the livelihoods of the youngest in poor families.

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