Child work and schooling under trade liberalization in Indonesia

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March 2009

Preliminary draft - comments welcome

Abstract

We examine the effects of trade liberalization on child work and schooling in Indonesia. Our estimation strategy identifies geographical differences in the effects of trade policy through district and province level exposure to reduction in import tariff barriers. We use seven rounds (1993 to 2002) of the Indonesian annual national household survey (Susenas), and relate workforce participation and school enrolment of children aged 10-15 to geographic variation in relative tariff exposure. Our main findings show that increased exposure to trade liberalization is associated with a decrease in child work and an increase in enrolment among 10 to 15 year olds. The effects of tariff reductions are strongest for children from low skill backgrounds and in rural areas. However, a dynamic analysis suggests that these effects reflect the long term benefits of trade liberalization, through economic growth and subsequent income effects, while frictions and negative adjustment effects may occur in the short term.

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1 Introduction

The effects of trade liberalization on work and schooling of children are widely debated and public and political interest in the issue is high. From a theoretical perspective the effects of trade liberalization on children's outcomes are a priori unclear (e.g., Ranjan 2001, Jafarey and Lahiri 2002) as trade liberalization acts potentially through several channels, changing relative prices, real income distribution, wages and net returns to education. The arising income and substitution effects can both raise and reduce schooling and workforce participation of children.

Nevertheless, empirical evidence on the issue is scarce. Cross-country studies generally find that trade liberalization did not lead to increases in child labour on average (Cigno, Rosati and Guarcello 2002), and more open economies have less child labour because they are richer (Edmonds and Pavcnik 2006). However, empirical studies based on micro data and direct evidence from liberalization experiences are required to identify the main channels at work. For Vietnam, Edmonds and Pavcnik (2005) find that rice price increases due to a dismantling of export quotas led to an overall decrease in child labour in the 1990s, especially due to the relatively evenly distributed favorable income effects. In contrast, Edmonds, Pavcnik and Topalova (2007) find that in rural India, districts that have been more strongly exposed to trade liberalization have experienced smaller increases in school enrolment on average, which they argue is primarily due to the unfavorable income effects to the poor and the relatively high costs of education in these districts.

Recent studies find empirical evidence that positive transitory income shocks can have negative effects on human capital accumulation of children. Temporary relative price changes, in particular changes in the value of children's time, can bring about substitution effects that may outweigh income effects, at least in

the short term. Kruger (2007) finds that positive coffee production value shocks in Brazil are associated with increased agricultural child labour incidence and decreased school attendance, in particular for the poor.

This study examines the trade liberalization experience of Indonesia in the 1990s, and relates child outcomes to district and province level exposure to reduction in import tariff barriers. In preparation to and following its accession to the WTO, Indonesia went through a major reduction in tariff barriers: average import tariff lines decreased from around 19.4 percent in 1993 to 8.8 percent in 2002. During that same period the workforce participation of children aged 10 and 15 years decreased while school enrolment steadily increased. Due to Indonesia's size and geographic variation in economic structure, the various districts have been very differently affected by trade liberalization, which offers us a valuable identification strategy.

Our identification strategy follows that of Edmonds et al. (2007), as we combine geographic variation in sector composition of the economy and temporal variation in tariff lines by product category, yielding geographic variation in (changes in) average exposure to trade liberalization over time. We define two alternative measures of geographic exposure to trade liberalization, by weighting tariffs on different product categories by the shares these products take in the regional (district level) structure of employment. In addition to this, the data allows us to go beyond the fixed effects approach employed in earlier studies and investigate the dynamic effects of trade liberalization.

The analysis draws on a large variety of data sources. Indonesia's annual national household survey (Susenas) provides information on the main activities of children and their basic socio-economic characteristics. We use four rounds of this repeated cross section data, spaced at 3–year intervals between 1993 and 2002. As the Susenas is representative at the district level, we apply our analysis

both at the individual level using pooled repeated cross section data with district fixed effects, and at the district level with pseudo panel data for 261 districts. The data on economic structure of the districts comes from information on regional GDP (GRDP) of the Central Bureau of Statistics in Indonesia (BPS), while district-level employment shares are based on the national household survey (Susenas). Additional information on district characteristics is derived from different rounds of PODES, the *Village Potential Census*. Finally, information on tariff lines comes from the TRAINS database.

Our main findings show that stronger exposure to trade liberalization has lead to a decrease in child labour among 10 to 15 year olds. The effects are strongest for the poor and children from low skill backgrounds. The effects of tariff reductions diminish for children from high skill households. A matching pattern is observed for schooling, as tariff reductions are associated with higher enrollment rates. However, the dynamic analysis suggests that these effects reflect the long term benefits of trade liberalization, through economic growth and subsequent income effects, while frictions and negative adjustment effects may occur in the short term.

The next section of the paper will elaborate on the context of the tariff reductions in Indonesia, and the developments in child labour and education for our study period. The third section presents the data and sets out the identification strategy. The results are then discussed in section 4 while section 5 concludes.

2 Trade liberalization and children in Indonesia

2.1 Trade liberalization in the 1990s

Trade liberalization in Indonesia took place over more than fifteen years. From the mid-1980s the former import substitution policy has been gradually replaced by a less restrictive trade regime, tariff lines have been reduced while at the same time a slow tarification of non–tariff barriers took place (Basri and Hill 2004). This laid the ground to the next wave of trade liberalization in the mid–1990s, with rising foreign firm ownership and increasing export and import penetration.[1] Tariff reductions were particularly strong in the 1990s, with Indonesian trade liberalization policy in that decade being defined by two major events: the conclusion of the Uruguay round in 1994 and Indonesia's commitment to multilateral agreements on tariff reductions, and the Asian economic crisis in 1998 and the post-crisis recovery process. After the Uruguay round Indonesia committed itself to reduce all of its bound tariffs to less than 40% within ten years. In May 1995 a large package of tariff reductions has been announced which laid down the schedule of major tariff reductions till 2003, and implemented further commitments of Indonesia to the Asia Pacific Economic Cooperation (Fane 1999). While the removal of specific NTBs was accompanied by a temporary rise in tariffs (especially in the food manufacturing sector), this did not affect the overall declining trend in any major way.

Figure 1 shows the reduction in tariff lines over time and the variation between industries. On average, nominal tariffs reduced from 17.2 percent in 1993

[1] Arguably, cronyism and specific protection of a few industries with ties to the Soeharto–family—especially chemicals, motor vehicles and steel—reduced the effect of overall liberalization. However, the largest part of the cronyism occurred in nontraded sectors and did not further affect protection of the traded sectors (Basri and Hill 2004, p.637).

to 6.6 percent in 2002. In this period the strongest reductions occurred from 1993 to 1995 and during the post crisis period after 1999. Tariff dispersion decreased especially in the post–crisis period when reductions have been more universal. While tariffs decreased across the board, we see differences in initial levels and in the extent of decrease (see Figure 2). Manufacturing started with relatively high tariff barriers but also shows the strongest reductions. For example, wood and furniture saw tariffs decline from 27.2 to 7.9 percent, textiles form 24.9 to 8.1 percent and other manufacturing from 18.9 to 6.4 percent. The average tariffs for agriculture were already much lower in 1993, at 11.5, and which reduced to 3.0 percent.[2]

Existing studies on the effects of Indonesian trade liberalization document both an increased firm productivity (Amiti and Konings 2007, Arnold and Smarzynska Javorcik 2005), and a relative improvement of working conditions (Sitalaksmi, Ismalina, Fitrady and Robertson 2007) in manufacturing, while the effects on overall poverty differ in the short and long run (Hertel, Ivanic, Preckel and Cranfield 2004). At the plant–level, Amiti and Konings (2007) find that trade liberalization affected firms' productivity through two main channels: Falling tariffs on imported inputs fostered learning and raised both product quality and variety, while falling output protection increased the competitive pressures. Comparing the two effects they argue that gains from falling input tariffs were considerably higher. Firm productivity has also been strongly affected by FDI flows: firms with increasing foreign ownership experienced restructuring, employment and wage growth as well as stronger linkages to export and import markets (Arnold and Smarzynska Javorcik 2005).

At the same time, working conditions seem to have improved especially in manufacturing: Based on individual employment data, Sitalaksmi et al. (2007)

[2]Figure 3 shows that tariff reductions and tariff levels are reasonably positively related; all outliers showing significant increases in tariffs are related to alcoholic beverages and soft drinks that were subject to a major retarification of non-tariff barriers.

argue that the increase in export–oriented foreign direct investment went along with rising relative wages in the textile and apparel sector. Additionally, working conditions, proxied by workers' own assessment of their income, working facilities, medical benefits, safety considerations and transport opportunities, improved over time in the expanding manufacturing industries as compared to agriculture.

The overall effects of trade liberalization on household poverty can be expected to differ in the short and the long run. The microsimulation analysis of Hertel et al. (2004) stratifies Indonesian households according to their earnings specialization in 1993 and shows that self-employed agricultural households are the most likely losers of a multilateral trade liberalization in the short–run, which is especially due to falling relative prices in agriculture. In the longer run some former agricultural workers will be moving into the formal wage labor market and the poverty headcount can be expected to fall for every earnings group. A further decomposition of the poverty changes finds that trade reforms in other countries lead to a reduction in poverty in Indonesia but that liberalization in Indonesia's protected manufacturing industries has an opposite effect.[3]

2.2 Child work

Indonesia experienced a steady decline in child work in the thirty years before the Indonesian economic crisis, but this decline stagnated with the onset of the crisis (e.g., Suryahadi, Priyambada and Sumarto 2005). Nevertheless, child work did not increase considerably in face of to the economic crisis (see e.g., Cameron 2001) which might be partly due to compositional effects: during the crisis children have been moving out of the formal wage employment sector into

[3] Suryahadi (2001) documents a fast increase in the employment of skilled labor force as well as a decline in wage inequality (faster wage growth for the unskilled) during trade liberalization in Indonesia although he does not establish causality.

other small-scaled activities (Manning 2000).

The decline in child work is portrayed in Figure 4, for boys and girls, and by different age groups. Child work is here defined as any work activity that contributes to household income. In 1993 almost 8.0 percent of boys age 10 to 12 had worked for income in the last week, but which had decreased to just under 2.3 percent in 2002. For boys age 13 to 15, work incidence halved over that period, from 28.3 percent in 1993 to 14.8 percent in 2002. Similar patterns are observed for girls, although girls tend to be less involved in income generating activities. Child work decreased from 5.4 to 1.6 percent for girls age 10 to 12, and from 22.1 to 10.0 percent for girls age 13 to 15. For the senior secondary school age group there is also a considerable decline in work activities; from 53.0 to 41.8 percent for boys and from 40.7 to 30.2 percent for girls. There are substantial gender differences in economic and domestic activities. Boys work activities is predominantly related to household income earnings, while girls' work activities consist of a relative large share of domestic work.

We find a slight increase in child work in the post-crisis recovery period, after 2000. This increase occurred in all sectors and could reflect the belated effects of the economic crisis, as Indonesia recovered more slowly from the crisis than its neighbours. While the crisis did not see initial increases in child work, household smoothing strategies may not be sustainable for longer durations, which could have increased pressure on households to draw upon child work as the adverse effects of the crisis prolonged.

Agriculture is the main sector for child work, and developments in this sector are driving the overall trends, as shown in figure 5. In 1993 just over 75 percent of child work in the age group 10 to 12 occurred in agriculture, while two in three child workers aged 13 to 15 worked in agriculture. The dominance of the agricultural sector in child work translates to a 79 and 69 percent share in the

overall reduction in child work. However, the relative changes from 1993 to 2002 are remarkably constant across sectors.

The trends in child work vary greatly by location and education attainment of the head of household (Table 1). Child work incidence is much higher in rural areas compared to urban areas, but rural areas experienced the largest decline, both in absolute and relative terms. Among boys in rural households 24.2 percent worked for income in 1993, among boys in urban areas 6.3 percent. By 2002 rural child work had halved to 12.3 percent, while in urban areas it had reduced by about a third, to 4.3 percent. For girls the decline in child work incidence is even stronger, dropping from 17.2 to 7.3 percent in rural areas, and from 7.0 to 3,9 percent in urban areas. Child work incidence decreases with the level of education of the head of household. Boys living in households where the head of household has not finished primary education, are almost 6 times more likely to work than boys from households where the head of household holds a degree higher than junior secondary school; for girls this ratio is about 3. For all the levels of education we see child work incidence decreasing.

2.3 Schooling

Indonesia has shown strong improvements in education attainment over past decades, reaching almost universal primary school enrolment already in the mid 1980s (e.g., Jones and Hagul 2001, Lanjouw, Pradhan, Saadah, Sayed and Sparrow 2002). Indonesia's current 9 year basic education policy aims at achieving universal enrolment for children up to the age of 15; that is, up to junior secondary school. But while junior secondary school enrolment has certainly improved, the large drop out of around 30 percent in the transition from primary to junior secondary (around 70 percent) remains a thorn in these ambitions. In particular striking are the relatively low transition rates among the poor. Amongst

the poorest 20 percent of the population, almost half of the children that finish primary school drop out at junior secondary level; this in stark contrast to the 12 percent drop out rate for the richest quintile (Paqueo and Sparrow 2006). Other problems that are still cause for concern are delayed enrolment and relatively high repetition rates.

The economic crisis did not lead to a large school dropout, as was initially feared after a similar experience in the late 1980s, although the increase in enrolment did stagnate in 1999. Households appeared to have employed alternative short term smoothing strategies to protect the education of their children, in particular children in secondary school as this is associated with relatively higher sunk costs and future returns (Thomas, Beegle, Frankenberg, Sikoki, Strauss and Teruel 2004). A second explanation can be found with the success of a social safety net scholarship programme in preventing a decrease in primary enrolment (Sparrow 2007).

Figure 6 shows the recent trend in enrolment by age group (irrespective of enrolment level). Enrolment among primary school age children has been near universal throughout the period 1993 to 2002. There is a strong increase in enrolment for the 13 to 15 and the 16 to 18 year old, with a slight decrease in the post crisis years. A striking feature for Indonesia is that, unlike for child work, we see no gender gap.

The differential trends in enrolment by household characteristics and location are shown in Table 2. While school enrolment is higher among children in urban areas, it is the strong increase in the rural areas that has driven the national trend during the 1990s. The enrolment rate in rural areas increased from just below 80 percent in 1993 to just above 85 percent in 2002. In urban areas we see little change in the male enrolment rate, but an increase for girls. Enrolment of boys and girls age 10 to 15 year is universal for children from relatively

high educated households. But for children in households where the head of household did not finish primary schooling, enrolment generally remains below 80 percent. But similar to rural areas, it is the group with the lowest initial level of enrolment where we see the largest relative and absolute gains from 1993 to 2002.

In the remainder of this analysis we focus on primary school age children close to the transition point, age 10 to 12, and junior secondary school age children, age 13 to 15. For children younger than 10 enrolment is universal and information on work is not available.

Public spending on education decreased slightly in early 1990s, to 2.5 percent in the pre-crisis year 1997. After the crisis this trend reversed. From 2000 to 2003 per capita public education spending increased by 49 percent, while education spending as share of GDP increased to 3 percent in 2003 (World Bank 2006). Nevertheless, public spending remains relatively low compared to countries in the region. In South-East Asia only Bangladesh and Cambodia spend a smaller share of GDP on education.

In general, public spending on education is targeted to the poor due to relatively pro-poor enrolment in public primary schools. But there are large differences between school levels. With low transition rates to secondary school among the poor, benefit incidence of public spending shows a neutral distribution for junior secondary school, and is targeted to the non-poor for secondary school (Lanjouw et al. 2002, World Bank 2006).

The main barriers to education concern both demand and supply factors. Paqueo and Sparrow (2006) find that enrolment is sensitive to the level of school fees, in particular for secondary education. However, indirect costs form even a more formidable obstacle to enrolment, in the form of tuition fees, text books and uniforms, and transport costs. Another deterrent for enrolment are opportunity

cost of schooling, as increased wages for children in local labour markets appear to reduce the probability of enrolment. Regarding the supply side factors, quality of education is a major source of concern in Indonesia. In particular teacher quality and absenteeism, and lack of access to secondary schools, especially in remote and rural areas (World Bank 2006).

2.4 Expected effects of trade liberalization

Consider a household consisting of one child and one adult where the adult maximizes a joint utility from consumption and schooling and allocates the child's time between work, and the normal goods schooling and leisure. The child is seen here as a perfect (although potentially less productive) substitute for unskilled adult labor (see e.g., Basu and Van 1998). Child work and schooling will react in this context to changes in household income, in child wages, and relative product prices.

Trade liberalization is generally reflected in changes in relative prices as they come closer to world market prices. A reduction of import tariffs, which is the focus of our analysis, alters relative prices and relative factor rewards in the economy. After reducing import tariffs, imported and import–competing products become relatively less expensive, which will both affect consumption and production patterns. For consumers, these changes in relative prices lead to an increase in real income as well as to an increase of opportunity costs of consumption of the other goods (child schooling and leisure among them).[4] Producers of the import competing good who experience the relative price decrease experience losses and reduce their production. As a consequence, the relative demand for the factors that are used more intensively in production decreases.

[4] This effect through the consumption channel we neglect for the moment, and plan to come back to it in our subsequent work. As long as districts show relatively similar consumption patterns, not controlling for the consumption channel will not bias our estimates.

The net effects of these changes on household income depend on the initial consumption pattern and factor ownership of the household. Changing relative factor rewards affect not only household income but also the opportunity costs of child schooling and leisure. In a dynamic context, they might also change the expected net returns to skill acquisition. If relative wages of unskilled increase (as documented for Indonesia by Suryahadi (2001)), this raises the net value of the child's time which might cet.par. raise child work and reduce schooling. Thus, income and substitution effects might act into opposite directions, and the net effect on child outcomes is an empirical question.

3 Data and empirical approach

3.1 Data

Indonesia's national socio-economic household survey, Susenas, provides information on the outcome variables and socio-economic characteristics for individuals and households. The Susenas is conducted annually around January-February and typically consists of a nationally representative sample of approximately 200,000 households. Districts are defined as municipalities (*Kota*) or predominantly rural areas (*Kabupaten*). Each district (both the *Kota* and *Kabupaten*) can be further divided into urban precincts (*Kelurahan*) and rural villages (*Desa*). The exception are the five districts comprising the capital Jakarta, which are defined as completely urban. It is at this district-urban/rural divide at which the Susenas sample is stratified. Hence, the Susenas is representative at the district level. In the analysis we will use the *Desa*/*Kelurahan* definition to identify households as either urban or rural.

The outcome variables record whether a child has worked in the last week and whether a child is enrolled in school. As mentioned earlier, *market work* is

defined as activities that directly generate household income, irrespectively of whether it was perforemd at the formal labor market or within the family. We distinguish it from *domestic work* which consists of household chores only. The Susenas also provides us information on education attainment of other household members, household composition and monthly household expenditure.

Information on tariff lines comes from the TRAINS database. These reflect the simple average of all applied tariff rates, which tend to be substantially lower than the bound tarrifs during the 1990s (WTO 1998, WTO 2003). As data on tariff lines is not available for some years (1994, 1997, and 1998), we use information from four three–year intervals (1993, 1996, 1999, and 2002) both in the pooled cross section and in the district panel. We can consistently match the relevant product categories to sectoral employment data derived from Susenas at the 1 digit level, of which the tradable sectors are agriculture, manufacturing and mining/quarrying.

The number of districts in the sample is not constant over time. First, we lose a number of districts due to missing data for some years. Districts in Aceh, Maluku and Irian Jaya have not been included in the Susenas in some years due to violent conflict situations at the time of the survey. In addition, the 13 districts in East Timor were no longer covered by Susenas after the 1999 for referendum on independence. We therefore drop these regions from the analysis. Another problem is that over the period 1993 to 2002 some districts have split up over time. To keep time consistency in the district definitions, we redefine the districts to the 1993 parent district definitions.

Since the Susenas rounds are representative for the district population in each year, we construct a district panel by pooling the four annually repeated cross sections. In addition to the pooled data, we collapse the data to the district level creating a district pseudo-panel. The advantage of pooling the

cross-section data is that we can account for individual heterogeneity, both in terms of characteristics and the impact of trade liberalization. For example, we are interested in the differential impact for high and low skilled labour, urban and rural areas, and gender. On the other hand, the pseudo-panel allows us to investigate dynamic effects.

Some descriptive statistics are given in Table 3. Pooling the four years of Susenas data yields a sample of 458,406 observations for children age 10 to 15. The top panel of the table shows the outcome variables and the individual and household characteristics that we will use in the regressions. The bottom panel shows the descriptive statistics for the different tariff measures after they have been merged to the individual data. The variable *Tariff* reflects a district's exposure to tariff protection based on employment shares.

3.2 Regional tariff exposure

Following Edmonds et al. (2007), tariff exposure measures are constructed by combining information on geographic variation in sector composition of the economy and temporal variation in tariff lines by product category. This yields a measure indicating how changes in exposure to tariff reductions varies by geographic area over the period 1993 to 2002.

We define two alternative measures of economic structure at district level: (i) sector share of GDP[5] (ii) sector share of employment. These measures reflect different dimensions of households' exposure to trade liberalization: the former through the distributional effects of local economic growth, the latter through labour market dynamics.

For each sector (h) the annual national tariff lines T_{ht} for the relevant product

[5]To be added in the next version.

categories are weighted by the 1993 sector shares in the district (k) economy:

$$T_{kt}^{GDP} = \sum_{h=1}^{H} \left(\frac{GRDP_{hk,1993}}{GRDP_{k,1993}} \times T_{ht} \right) \quad (1)$$

$$T_{kt}^{L} = \sum_{h=1}^{H} \left(\frac{L_{hk,1993}}{L_{k,1993}} \times T_{ht} \right) \quad (2)$$

The evolution of tariff protection, weighted by the GRDP and employment shares, is shown in figure 7. Exposure is higher when the tariff lines are weighted by employment shares as compared to GRDP. This emphasizes the role of agriculture in terms of employment as compared to economic production.[6]

Figure 8 clearly shows a large degree of geographic variation in tariff exposure over time and location. The lines reflect the changes in tariff exposure for each province, grouped by main geographic area.

3.3 Identification

3.3.1 Static analysis: pooled district panel

Identification of the impact of tariff reductions relies on the geographic panel nature of the combined data, and in particular on the variation in tariff exposure over regions and over time. We include district fixed effects, δ_k, while time-region fixed effects control for aggregate time trends, λ_{rt}, allowing these to differ by the five main geographic areas of the archipelago: the Islands of Java, Sumatra, Kalimantan and Sulawesi, and a cluster of smaller Islands consisting of Bali and the Nusa Tenggara group. We also include a set of household and

[6]During the analyzed time–span, rice prices were administered, and the national trading company (BULOG) had an import monopoly on rice. Export bans on rice were also effective. Hence, we exempt rice production from tradable agricultural good production, and reduce the labor and GDP shares in tradable agriculture by the share of rice fields in agricultural plantations within each district. We compute this latter information from the 1993 village agricultural census (PODES).

individual control variables, $\mathbf{X}_{ikt}$: age, gender and education of the household head, household size, and whether a household resides in an urban or rural area.

The main specification for the pooled district panel is

$$\Pr(l_{ikt} = 1) = \Pr(\alpha + \beta T_{kt} + \mathbf{X}'_{ikt}\boldsymbol{\gamma} + \lambda_{rt} + \delta_k + \epsilon_{ikt} > 0) \tag{3}$$

We estimate the model separately for boys and girls, by age group. The differential impact of trade liberalization is further explored by interacting the tariff exposure measure with the education of the head of household, as proxy for high or low skill labour, and a rural dummy variable.

3.3.2 Potential sources of bias

The main identifying assumption is that time variant shocks ϵ_{ikt} are orthogonal to T_{kt}. This would seem a reasonable assumption, given that T_{kt} consists of the baseline economic structure and national changes in tariff regime. Thus, any temporal or regional variation endogenous to child work activities would be controlled for by time and geographic fixed effects. The identifying assumption would be violated if changes in district tariff exposure is endogenous to different local growth trajectories. Within the Indonesian context, regional variation in growth trajectories may be partly determined by initial conditions regarding sectoral composition, in particular agriculture.

A first trend to note is that districts with a higher initial incidence of child labour experience larger changes in child labour over time. This is reflected by figure 9a, which depicts a strong correlation between child work incidence in districts in 1993 and the decrease in child labour from 1993 to 2002. With the bulk of child work located in agriculture, we would expect child work to decrease faster in districts with a relatively large share of of the population active in

agriculture and living in rural areas in 1993. These patterns are confirmed by figure 9b for the initial rural population share, 9c for the initial agricultural labour force share and 9d for the the GRDP agriculture share.

Regional diversity in structural change and economic outcomes is a prominent feature of Indonesia's economic geography. In particular, a rapid shift out of agriculture and increase in manufacturing and services. **?** show evidence of strong regional variation in economic growth and structural change since the 1970s. Structural change has been relatively slow in poor regions and provinces with a relatively strong comparative advantage in agriculture. However, they find only weak positive correlation between economic growth and structural change in districts. This is consistent with the patterns in our data, as we find a slight negative correlation between the 1993 share of agriculture in GRDP and the change in real per capita GRDP from 1993 to 2002 (figure 10a).

A related initial conditions problem, discussed at length by Edmonds et al. (2007), lies with the non-tradable sector, which is also an element in T_{kt}. Districts may experience different growth paths, depending on the size of the non-tradable sector. Figure 10b shows weak negative correlation between changes real GRDP per capita and the initial share of the non-tradable sector in GRDP. However, we see contrasting patterns for initial labour and GRDP share of the non-tradable sector. Figure 11 shows that child work decreased faster in districts with relatively small share of the labour force engaged in the non-tradable sector (figure 11b), but at the same time a large initial fraction of GRDP (figure 11b).

Since the initial sectoral composition of district economies are at the heart of T_{kt}, such differential trends in child labour could confound our estimates.

3.3.3 Dynamic analysis: district pseudo-panel

Collapsing the pooled district panel to a district pseudo-panel provides more options to further address the potential source of bias and allow a dynamic analysis, at the cost of losing the individual variation in the data. The district pseudo-panel analogue to (3) is

$$\bar{l}_{kt} = \alpha + \beta T_{kt} + \bar{\mathbf{X}}'_{ikt}\boldsymbol{\gamma} + \lambda_{rt} + \delta_k + \bar{\epsilon}_{kt} \tag{4}$$

where $\bar{l}_{kt}$ is the fraction of children in district k that work in a given year t.

This specification is still prone to the potential source of bias through time variant unobservables. However, it provides a first indicative test of strict exogeneity of tariff exposure, $E\{T_{kt}\bar{\epsilon}_{ks}\} = 0$ for all s and t. With the fixed effects removed after a first-difference transformation of (4), T_{kt} should add no extra explanatory information under the assumption of strict exogeneity

$$\Delta\bar{l}_{kt} = \beta\Delta T_{kt} + \varphi T_{kt} + \Delta\bar{\mathbf{X}}'_{ikt}\boldsymbol{\gamma} + \lambda_{rt} + \Delta\bar{\epsilon}_{kt} \tag{5}$$

which implies the testable hypothesis that $\varphi = 0$.

As suggested in Edmonds et al. (2007), the scope of bias related to initial conditions can be investigated further by introducing initial sector shares as control variables. We therefore add to equation (5) the 1993 labour and GDP shares (for specifications with T^L and T^{GDP}, respectively) of the agriculture, mining, manufacturing, construction, trade, and transport sectors (with utilities as reference group), in addition to adult literacy rate in districts.

Finally, we exploit the pseudo-panel fully by taking a dynamic specifcation, where we include a lagged dependent variable and lagged tariff measure.

$$\bar{l}_{kt} = \beta T_{kt} + \phi T_{kt-1} + \theta\bar{l}_{kt-1} + \bar{\mathbf{X}}'_{ikt}\boldsymbol{\gamma} + \lambda_{rt} + \delta_k + \bar{\epsilon}_{kt} \tag{6}$$

By including a lagged dependent variable we account for state dependence, and potential confounding differential trends in child labour between relatively high and low child labour districts. By investigating lagged effects of tariff changes we can identify short and long term effects. The immediate effect of a percentage point change in tariff exposure is reflected by β. The total long term change in $\bar{l}$ as a result of a percentage point change in tariff exposure, taking into account lagged effects of tariff changes and its dynamic multiplier effect trough $\bar{l}_{kt-1}$, is approximated by $(\beta + \phi)/(1 - \theta)$.

Adding a lagged dependent variable to the model introduces a new source of bias. We therefore adopt a GMM approach to resolve any bias from the lagged dependent variable and potential endogeneity of tariff exposure. We apply an Arrelano-Bond difference GMM estimator, with a two-step Windmeijer correction. System estimation is not suitable as this requires the identifying assumption that the instruments are not correlated with the fixed effects. This is a problematic assumption for our study as a main cause of concern lies with the correlation of changes in child labour and tariffs with the initial characteristics of districts. This is also reflected in the Sagan-Hansen overidentifying restrictions tests results, which strongly reject the validity of the instruments in case of system GMM, but not for difference GMM. We treat tariff exposure and lagged child work as endogenous, and adult literacy as pre-determined. First differences of these variables are then instrumented with their lagged levels.

4 Results

The estimated effects of tariff reductions on work are given in Table 4. The basic specification (model A) indicates that a decrease in tariff exposure is associated with a decrease in child work for 10 to 15 year old children, but the size of the effect varies by gender and also depends on the nature of the exposure measure.

A percentage point decrease in tariff exposure leads to a 1.7 percentage point decrease in work incidence of boys and 1.2 percentage point for girls. For our period of analysis, the around 4.5 percentage point decrease in tariff exposure (c.f. Figure 7) is connected with about 7.7 percentage point decrease in boys' work (out of the total decrease of 9.6 percentage points (Table 1)) and with about 5.4 percentage point decrease in girls' work (out of the total decrease of 8 percentage points (Table 1)).

Model B investigates differential effects by skill level. The tariff exposure measure is interacted with the level of education of the head of household, defined as (i) not completed primary school, (ii) completed primary school, (iii) completed secondary school and (iv) completed higher education. The benefits of tariff reductions are relatively higher for low skill households.

Model C suggests that the bulk the effect of trade liberalization lies with rural areas. For tariff-rural interaction term is close to the overall effect, while the baseline tariff coefficient (reflecting urban impact) is small and statistically not significant.

The effects are presented separately for age groups age 10 to 12 and age 13 to 15. As expected, the effects are larger for junior secondary school age children compared to primary school age children. This reflects the transition gap after primary education and differences in opportunity costs to schooling. A percentage point decrease in tariff exposure leads to a decrease in child work of 1.1 (0.8) percentage points for boys (girls) age 10 to 12 and 2.5 (1.8) for boys (girls) age 13 to 15. But the overall patterns are similar for both age groups: both show that the marginal effects of tariff reductions diminish as the skill level of households increases, and that the effects are relatively stronger in rural areas.

The effects of tariff reductions on school enrolment are presented in Table 5

for the full sample and by age group. A percentage point decrease in exposure to tariff protection results to a 0.5 percentage point increase in enrolment for boys, and 0.3 percentage point for girls aged 10 to 15.

We see differences by age group, as the marginal effects are statistically significant only for the older children. For the 13 to 15 year age group, a percentage point decrease in tariff exposure is associated with an 1.0 percentage point increase in enrolment for boys and 0.7 percentage point for girls. A 4.5 percentage point decrease in tariff exposure over the period of analysis would then be responsible for a 4.3 percentage point increase in enrolment for boys and 2.9 for girls of junior secondary school age. The pattern of effects on enrolment mirror those of child work, but in terms of size of coefficients the effects seem small. But this is due to the relatively high enrolment rates in Indonesia. Compared to non-enrolment, the effects are sizable. For example, between 1993 and 2002, non-enrolment among the 13 to 15 year age group decreased by 28 percent for boys and 35 percent for girls (translating to 0.8 and 1.1 percentage points, respectively). About half of this effect for boys and one quarter of the effect for girls can be attributed to tariff changes.

The benefits of trade liberalization for human capital accumulation are relatively higher for 13 to 15 year old children from low skill households and, similar to the child work results, mainly concentrated in rural areas. For 10 to 12 year olds the marginal benefits are more evenly distributed.

Tables **??** and 7 present the estimates for the district level pseudo–panel where the dependent variables are the share of children (aged 10–15) working or being enrolled in school in a given district/year cell. The results are consistent with the pooled cross section results. The tables report results for both random and fixed effects specifications. As expected, a fixed effects specification diminishes the size of the coefficients. The size of the impact estimates are further

reduced as control variables are included. Nevertheless, they remain precise and within range of the pooled cross section results. Tables **??** and 7 also report estimates for sub-samples, by level of schooling of the head of household. These estimates also show patterns similar to the pooled cross section.

The fixed effect approach is vulnerable to time-invariant unobservables. One potential confounding factor in the Indonesian context could be the development in rural areas, in particular households moving out of agriculture. We therefore include a variable indicating the changes in the share of district population living in rural areas. If our estimates indeed confound the effects of trade liberalization and reduction of the agricultural population, then the results should be sensitive to including the rural population share variable. However, we find that the tariff coefficient is robust to including this variable, even though the rural population share coefficient is relatively large and statistically significant. This suggest that the move out of agriculture observed in the 1990s is an important factor driving changes in schooling and child work, but is not confounding the impact estimates of tariff changes.

Simple inclusion of the lagged tariff variable in column (4) indicates that immediate and longer–term effects of trade liberalization might differ, in particular for schooling. Including a lagged tarrif term eliminates the immediate effect on schooling, suggesting that all the effect comes from lagged changes. In fact, the coefficients suggest that the model without lags seems to pick up the net result of an initial negative effect on schooling, which is outweighed in the long term by a positive effect. However, the standard error for the initial effect is too large to confirm this. For child work the results are not sensitive to including lagged tariffs.

5 Conclusion

This paper examined the effects of trade liberalization on child work and schooling in Indonesia. In the 1990s, Indonesia went through a major reduction in tariff barriers, with average import tariff lines decreased from around 19.4 percent in 1993 to 8.8 percent in 2002. A period which also saw reductions in child work increased school enrolment.

We identify the effects of trade liberalization by combining geographic variation in sector composition of the economy with temporal variation in tariff lines by product category. This yields geographic variation in changes in average exposure to trade liberalization over time, hence identifying geographical differences in the effects of trade policy.

Our main findings suggest that Indonesia's trade liberalization experience in the 1990s has lead to an increase in human capital investments, mainly through increased economic growth and reduced poverty. Increased exposure to trade liberalization is associated with a decrease in child work and an increase in enrolment among 10 to 15 year old children. The effects of tariff reductions increase with the age of children, and are strongest for children from low skill backgrounds and in rural areas. Through these human capital investments, trade liberalization will have long term welfare implications, in particular for low skill, and presumably poorer, households.

Extensions to this paper will (i) introduce alternative measures of tariff expossure, based on district GDP by sector, (ii) probe deeper into the endogenous relationship between district tariff exposure and human capital investments, by fully exploiting the posibility of the district pseudo-panel, (iii) investigate the main transmission channels of the effects of trade liberalization, both in the short and long term, and (iv) elaborate on the distributional effects of Indone-

sia's trade policy.

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A Tables

Table 1: **Evolution of market work of children over time**

Share of boys aged 10–15 doing market work

	By head's educational attainment				By location			
Year	None	Primary	Low sec.	Higher	Urban	Rural	Total	N
1993	0.264	0.172	0.097	0.045	0.063	0.242	0.187	63,009
1994	0.254	0.157	0.090	0.046	0.060	0.224	0.172	63,556
1995	0.256	0.156	0.089	0.043	0.066	0.227	0.175	59,992
1996	0.221	0.142	0.087	0.042	0.059	0.195	0.153	61,234
1997	0.197	0.120	0.066	0.035	0.045	0.169	0.128	58,487
1998	0.217	0.137	0.093	0.039	0.059	0.187	0.144	56,783
1999	0.206	0.131	0.083	0.042	0.054	0.175	0.139	54,907
2000	0.174	0.110	0.065	0.031	0.039	0.154	0.112	51,003
2001	0.196	0.123	0.088	0.042	0.055	0.169	0.127	54,156
2002	0.155	0.091	0.060	0.027	0.043	0.123	0.091	53,694
N	222,837	191,241	67,801	99,714	193,511	388,082	581,593	

Share of girls aged 10–15 doing market work

	By head's educational attainment				By location			
Year	None	Primary	Low sec.	Higher	Urban	Rural	Total	N
1993	0.190	0.121	0.085	0.066	0.070	0.172	0.139	59,895
1994	0.182	0.116	0.068	0.057	0.063	0.158	0.128	59,582
1995	0.167	0.112	0.077	0.061	0.066	0.152	0.124	57,102
1996	0.152	0.093	0.066	0.055	0.057	0.131	0.107	58,430
1997	0.121	0.076	0.053	0.044	0.042	0.106	0.084	55,427
1998	0.137	0.092	0.069	0.050	0.058	0.120	0.098	53,814
1999	0.132	0.080	0.059	0.048	0.049	0.109	0.091	51,936
2000	0.106	0.070	0.047	0.032	0.035	0.095	0.072	47,832
2001	0.121	0.075	0.068	0.045	0.049	0.104	0.083	50,926
2002	0.098	0.053	0.037	0.030	0.039	0.073	0.059	50,423
N	207,841	180,188	64,162	97,517	188,091	361,617	549,708	

Table 2: **Evolution of school enrolment of children over time**

Share of boys aged 10–15 enroled in school

	By head's educational attainment				By location			
Year	None	Primary	Low sec.	Higher	Urban	Rural	Total	N
1993	0.738	0.865	0.941	0.977	0.927	0.791	0.833	63,009
1994	0.750	0.872	0.951	0.976	0.935	0.806	0.847	63,556
1995	0.757	0.871	0.944	0.976	0.926	0.807	0.845	59,992
1996	0.768	0.876	0.944	0.977	0.928	0.822	0.855	61,234
1997	0.780	0.881	0.952	0.979	0.934	0.836	0.868	58,487
1998	0.773	0.873	0.940	0.980	0.930	0.829	0.863	56,783
1999	0.784	0.884	0.951	0.978	0.932	0.844	0.870	54,907
2000	0.789	0.886	0.957	0.977	0.929	0.848	0.878	51,003
2001	0.793	0.890	0.949	0.978	0.935	0.851	0.879	54,156
2002	0.785	0.882	0.946	0.978	0.933	0.851	0.881	53,694
N	222,837	191,241	67,801	99,714	193,511	388,082	518,593	

Share of girls aged 10–15 enroled in school

	By head's educational attainment				By location			
Year	None	Primary	Low sec.	Higher	Urban	Rural	Total	N
1993	0.737	0.857	0.938	0.947	0.908	0.787	0.827	59,895
1994	0.747	0.866	0.949	0.948	0.914	0.805	0.841	59,582
1995	0.758	0.867	0.942	0.951	0.915	0.806	0.841	57,102
1996	0.765	0.877	0.947	0.956	0.921	0.821	0.853	58,430
1997	0.774	0.883	0.945	0.958	0.926	0.831	0.863	55,427
1998	0.779	0.879	0.940	0.958	0.925	0.849	0.864	53,814
1999	0.793	0.888	0.954	0.964	0.933	0.849	0.875	51,936
2000	0.804	0.892	0.958	0.969	0.933	0.855	0.884	47,832
2001	0.819	0.903	0.961	0.969	0.935	0.871	0.892	50,926
2002	0.797	0.888	0.953	0.969	0.935	0.857	0.887	50,423
N	207,841	180,188	64,162	97,517	188,091	361,617	549,708	

Table 3: **Descriptive statistics**

Variables	No. obs.	Mean	St.dev.	Min.	Max.
Market work	458406	0.123	0.328	0	1
School enrolment	458406	0.859	0.348	0	1
Household work	458406	0.028	0.166	0	1
Staying idle	458406	0.048	0.215	0	1
Female	458406	0.486	0.500	0	1
Age	458406	12.455	1.706	10	15
Female head	458406	0.081	0.272	0	1
Household size	458406	5.727	1.815	1	22
Rural	458406	0.668	0.471	0	1
Head's ed.: none	458406	0.381	0.486	0	1
Head's ed.: primary	458406	0.328	0.470	0	1
Head's ed.: secondary	458406	0.117	0.321	0	1
Head's ed.: higher	458406	0.174	0.379	0	1
Year	1997.3	3.365	1993	2002	
Tariff measures:					
Tariff	458406	5.416	3.086	0.176	14.900
Tariff in agriculture	458406	4.309	3.235	0.000	13.668
Tariff in mining	458406	0.055	0.078	0.000	1.090
Tariff in manufacturing	458406	1.052	0.932	0.023	6.744

Table 4: **Pooled results on child work and tariff protection**

	Market work of children					
	(1)	(2)	(3)	(4)	(5)	(6)
Sample	Aged 10–15		Aged 10–12		Aged 13–15	
	Boys	Girls	Boys	Girls	Boys	Girls
MODEL A						
Tariff	0.0170**	0.0122**	0.0112**	0.0078**	0.0247**	0.0179**
	(0.0019)	(0.0014)	(0.0017)	(0.0011)	(0.0027)	(0.0024)
Adj. R2	0.156	0.108	0.067	0.053	0.152	0.095
MODEL B						
Tariff ×	0.0179**	0.0131**	0.0120**	0.0087**	0.0257**	0.0188**
Head's ed.: none	(0.0020)	(0.0015)	(0.0017)	(0.0012)	(0.0027)	(0.0026)
Tariff ×	0.0155**	0.0107**	0.0098**	0.0063**	0.0229**	0.0166**
Head's ed.: primary	(0.0019)	(0.0015)	(0.0017)	(0.0011)	(0.0027)	(0.0025)
Tariff ×	0.0103**	0.0082**	0.0062**	0.0057**	0.0157**	0.0115**
Head's ed.: secondary	(0.0019)	(0.0015)	(0.0017)	(0.0012)	(0.0026)	(0.0026)
Tariff ×	0.0041*	0.0031*	0.0027†	0.0039**	0.0067**	0.0031
Head's ed.: higher	(0.0018)	(0.0015)	(0.0016)	(0.0012)	(0.0025)	(0.0027)
Adj. R2	0.157	0.108	0.069	0.054	0.154	0.097
MODEL C						
Tariff	0.0010	0.0020	0.0005	0.0021†	0.0016	0.0021
	(0.0019)	(0.0015)	(0.0016)	(0.0011)	(0.0028)	(0.0027)
Tariff ×	0.0137**	0.0087**	0.0091**	0.0048**	0.0197**	0.0137**
Rural	(0.0011)	(0.0010)	(0.0008)	(0.0007)	(0.0018)	(0.0017)
Adj. R2	0.157	0.108	0.069	0.054	0.154	0.096
In all models:						
District fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Region×year interactions	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Nr. obs.	235,393	223,013	122,834	114,731	112,559	108,282
Nr. districts	261	261	261	261	261	261

Notes: All models were estimated by OLS, weighted by sampling weights. Further controls include age dummies, household size, and dummies on heads' education, female head, and rural. Robust standard errors (clustered at district level) are reported in parentheses. *,**,† denote significance at the 1, 5, and 10% level.

Table 5: **Pooled results on child schooling and tariff protection**

	School enrolment of children					
Sample	Aged 10–15		Aged 10–12		Aged 13–15	
	Boys	Girls	Boys	Girls	Boys	Girls
MODEL A						
Tariff	-0.0047**	-0.0032*	-0.0010	-0.0012	-0.0095**	-0.0065**
	(0.0015)	(0.0015)	(0.0011)	(0.0012)	(0.0025)	(0.0027)
Adj. R2	0.184	0.191	0.049	0.048	0.185	0.179
MODEL B						
Tariff ×	-0.0055**	-0.0040**	-0.0018	-0.0025†	-0.0104**	-0.0072**
Head's ed.: none	(0.0016)	(0.0016)	(0.0012)	(0.0013)	(0.0027)	(0.0028)
Tariff ×	-0.0034**	-0.0019	0.0002	0.0007	-0.0081**	-0.0056*
Head's ed.: primary	(0.0015)	(0.0014)	(0.0011)	(0.0012)	(0.0026)	(0.0026)
Tariff ×	-0.0006	0.0020	0.0012	0.0013	-0.0026	0.0029
Head's ed.: secondary	(0.0014)	(0.0014)	(0.0012)	(0.0012)	(0.0025)	(0.0025)
Tariff ×	0.0030*	0.0066**	0.0019	0.0014	0.0039	0.0117
Head's ed.: higher	(0.0015)	(0.0017)	(0.0012)	(0.0013)	(0.0026)	(0.0029)
Adj. R2	0.185	0.192	0.050	0.048	0.186	0.180
MODEL C						
Tariff	0.0022	0.0018	0.0015	0.0010	0.0030	0.0022
	(0.0017)	(0.0017)	(0.0013)	(0.0013)	(0.0029)	(0.0031)
Tariff ×	-0.0059**	-0.0043**	-0.0021**	-0.0019**	-0.0107**	-0.0075**
Rural	(0.0009)	(0.0010)	(0.0007)	(0.0006)	(0.0017)	(0.0019)
Adj. R2	0.185	0.191	0.050	0.048	0.186	0.179
In all models:						
District fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Region×year interactions	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Nr. obs.	235,393	223,013	122,834	114,731	112,559	108,282
Nr. districts	261	261	261	261	261	261

Notes: All models were estimated by OLS, weighted by sampling weights. Further controls include age dummies, household size, and dummies on heads' education, female head, and rural. Robust standard errors (clustered at district level) are reported in parentheses. *,**,† denote significance at the 1, 5, and 10% level.

Table 6: **Child market work and tariff protection in the district panel (10–15 year olds)**

	Labour shares weighted tariffs				GRDP shares weighted tariffs			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	RE	FE	FE	FE	RE	FE	FE	FE
Tariffs	0.0151**	0.0128**	0.0113**	0.0108**	0.0111**	0.0111**	0.0062**	0.0155**
	(0.0010)	(0.0013)	(0.0014)	(0.0024)	(0.0016)	(0.0020)	(0.0020)	(0.0040)
Lagged tariffs				0.0030				-0.0056+
				(0.0023)				(0.0030)
Average age			0.0352*	0.0364*			0.0273+	0.0406*
			(0.0143)	(0.0152)			(0.0156)	(0.0165)
Share of girls			-0.0964*	-0.0735			-0.0638	-0.0407
			(0.0463)	(0.0479)			(0.0490)	(0.0513)
Share of hh-heads w/o education			0.1288**	0.1250**			0.1486**	0.1763**
			(0.0290)	(0.0319)			(0.0330)	(0.0345)
Adult literacy			-0.1589**	-0.1762*			-0.1916**	-0.0493
			(0.0585)	(0.0698)			(0.0723)	(0.0807)
Rural share			0.0503*	0.0614**			0.0435*	0.0614**
			(0.0207)	(0.0214)			(0.0219)	(0.0229)
District fixed effects	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*
Region×year interactions	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*
Observations	1044	1044	1044	783	976	976	976	732
Nr. districts	261	261	261	261	244	244	244	244
R-squared (within)	0.55	0.55	0.61	0.55	0.50	0.50	0.57	0.52

Notes: All models include time dummy variables. Standard errors are reported in parentheses. *,**,† denote significance at the 1, 5, and 10% level.

Table 7: **Difference estimates and test for exogeneity, child market work (10–15 year olds)**

	Labour shares weighted tariffs				GRDP shares weighted tariffs			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔTariffs	0.0094**	0.0078**	0.0048+	0.0096	0.0073**	0.0102**	0.0069	0.0184*
	(0.0018)	(0.0024)	(0.0026)	(0.0059)	(0.0026)	(0.0037)	(0.0044)	(0.0087)
Tariffs		-0.0013	0.0020	0.0046		0.0021	0.0020	0.0074
		(0.0013)	(0.0019)	(0.0032)		(0.0019)	(0.0031)	(0.0047)
ΔAverage age	0.0531**	0.0532**	0.0562**	0.0562**	0.0528**	0.0526**	0.0566**	0.0619**
	(0.0135)	(0.0135)	(0.0134)	(0.0137)	(0.0141)	[0.0141)	(0.0148)	(0.0152)
ΔShare of girls	-0.0797+	-0.0792+	-0.0839*	-0.0894*	-0.0880*	-0.0873*	-0.0845+	-0.0806+
	(0.0427)	(0.0427)	(0.0425)	(0.0437)	(0.0443)	[0.0443)	(0.0467)	(0.0472)
ΔShare of hh-heads w/o education	0.1378**	0.1363**	0.1399**	0.1368**	0.1497**	0.1515**	0.1600**	0.1625**
	(0.0286)	(0.0286)	(0.0287)	(0.0291)	(0.0298)	(0.0299)	(0.0313)	(0.0318)
ΔAdult literacy	-0.2026**	-0.1966**	-0.1692*	-0.1801**	-0.1874**	-0.1928**	-0.1490*	-0.1645*
	(0.0620)	(0.0623)	(0.0660)	(0.0672)	(0.0654)	(0.0656)	(0.0725)	(0.0736)
ΔRural share	0.0576**	0.0565**	0.0601**	0.0670**	0.0481*	0.0489*	0.0572*	0.0607**
	(0.0206)	(0.0206)	(0.0207)	(0.0214)	(0.0213)	(0.0213)	(0.0222)	(0.0229)
Region×year interactions	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Initial conditions	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*
Initial conditions×year interactions	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*
Observations	783	783	783	783	732	732	684	684
Nr. districts	261	261	261	261	244	244	228	228
R-squared (within)	0.20	0.20	0.22	0.24	0.18	0.19	0.20	0.23

Notes: Initial conditions are 1993 labour/GRDP shares (for T^L/T^{GDP}) of agriculture, mining, manufacturing, construction, trade, and transport (with utilities as reference group) and adult literacy rate in districts. Standard errors are reported in parentheses. *,**,† denote significance at the 1, 5, and 10% level.

B Figures

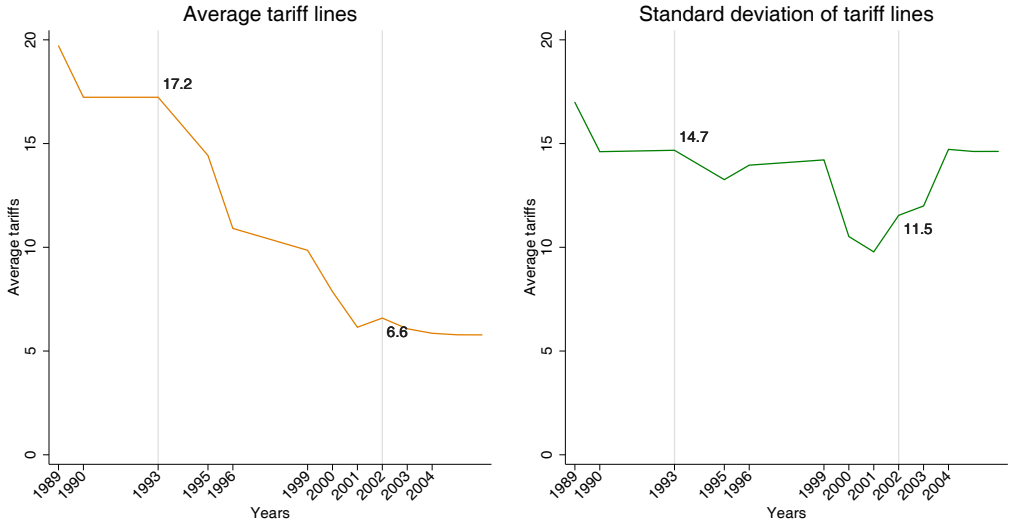

Figure 1: Tariff reductions in Indonesia

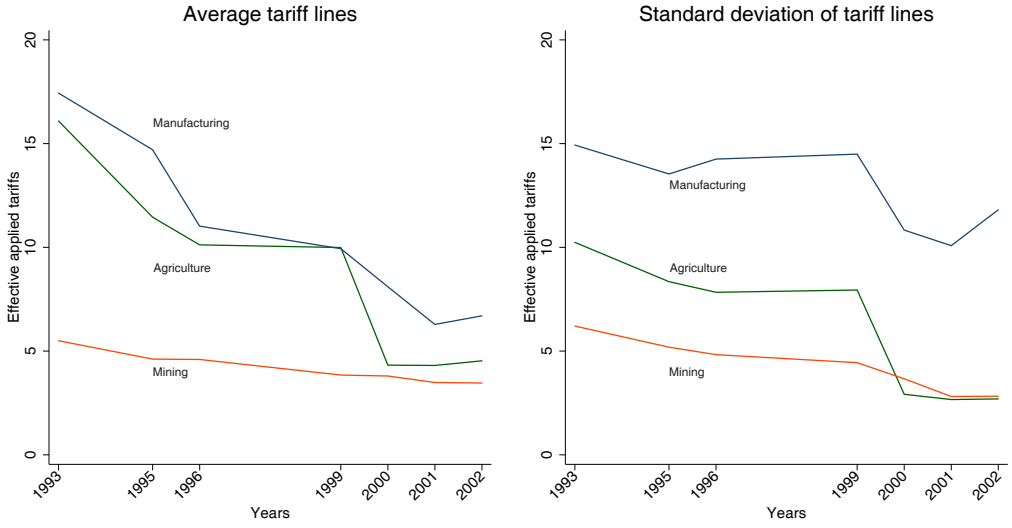

Figure 2: Tariff reductions by sectors

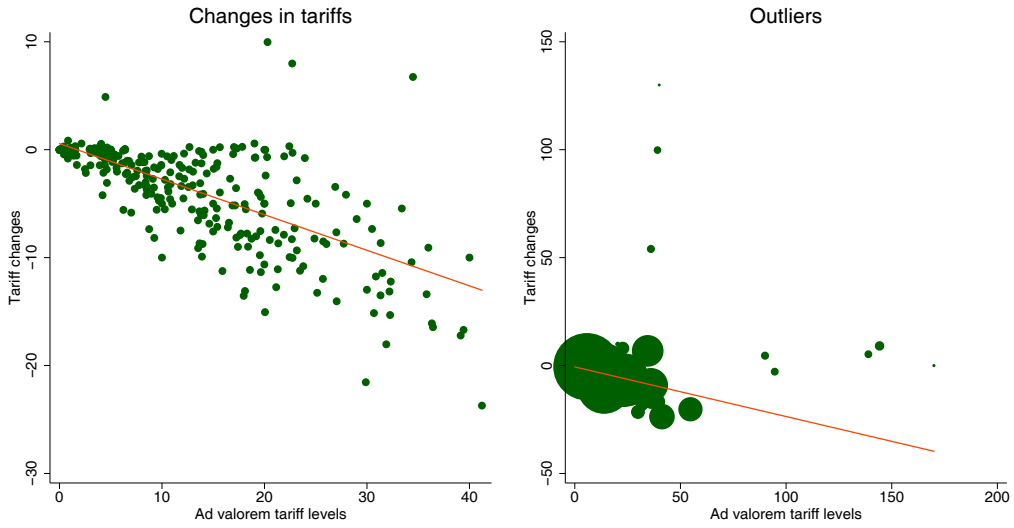

Figure 3: Tariff levels and reductions

Figure 4: Work of children, by gender and age group

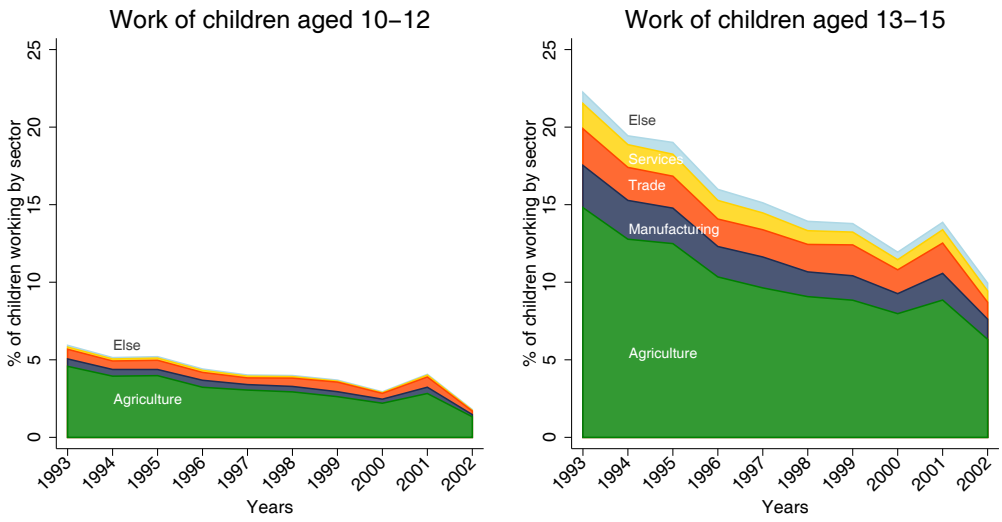

Figure 5: Sectoral distribution of child work

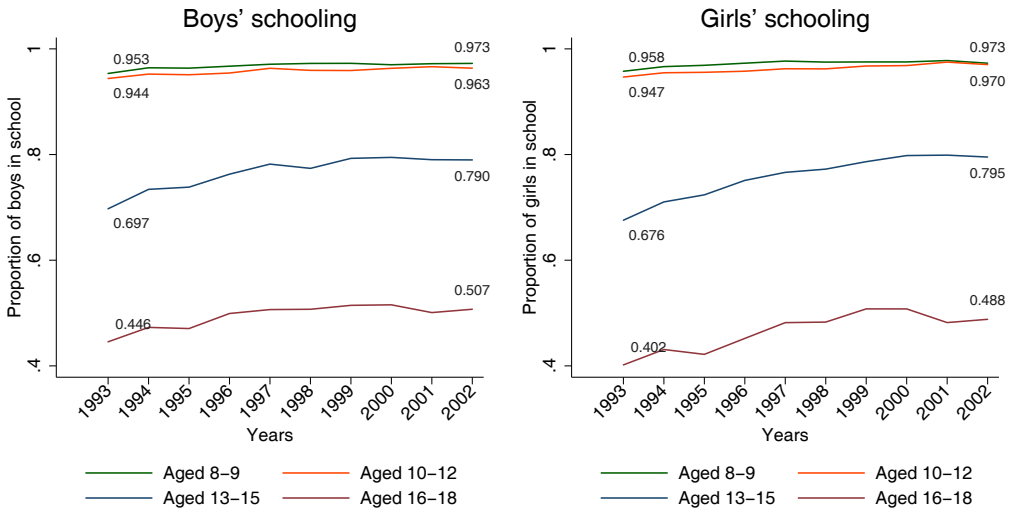

Figure 6: School enrolment of children, by gender and age group

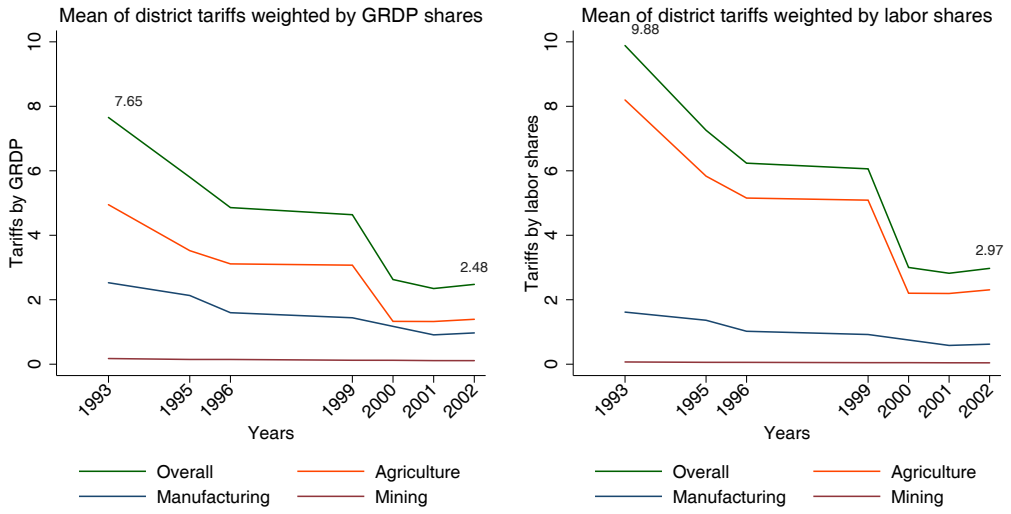

Figure 7: Evolution of tariff protection

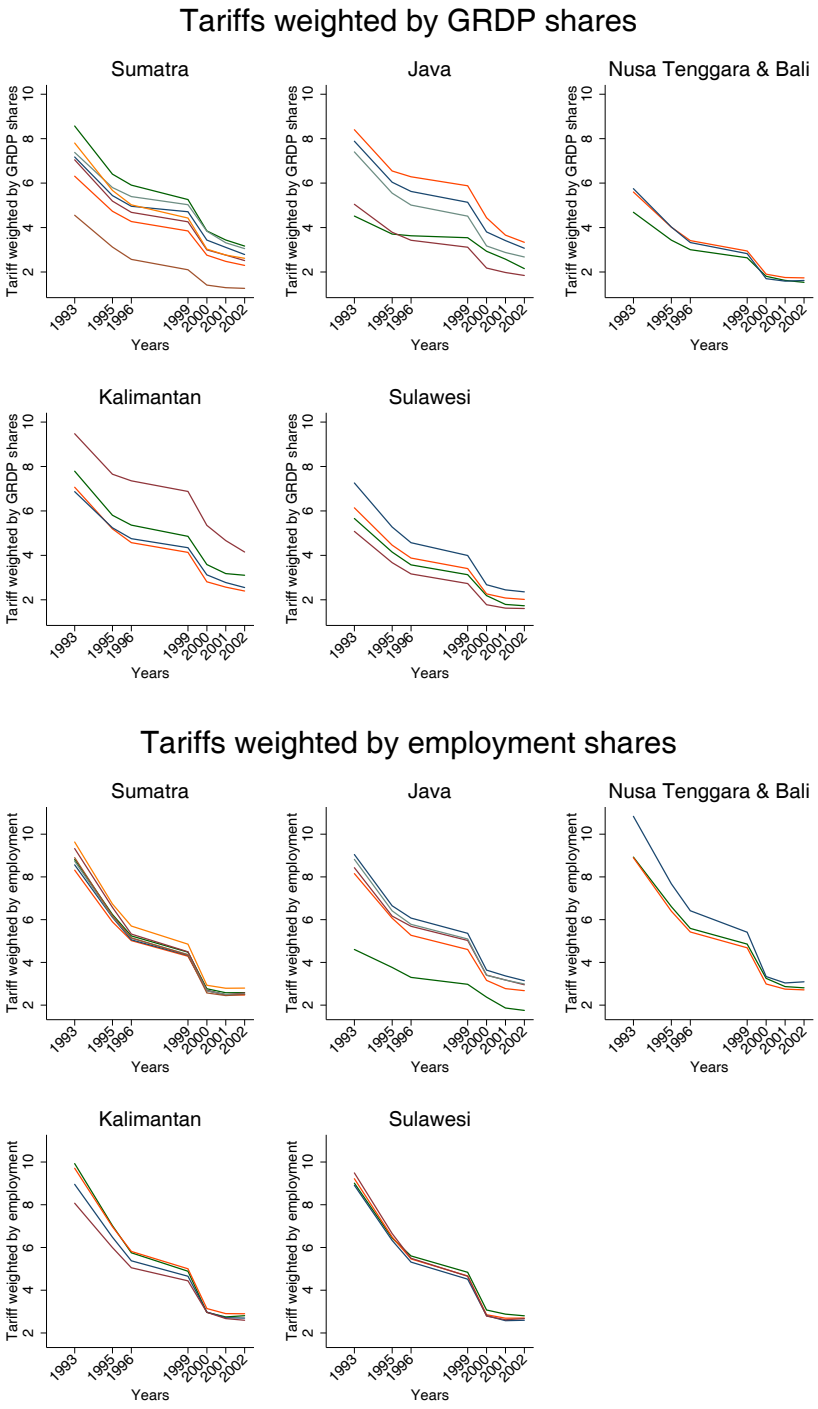

Figure 8: Geographic variation in tariff reduction, by region and province

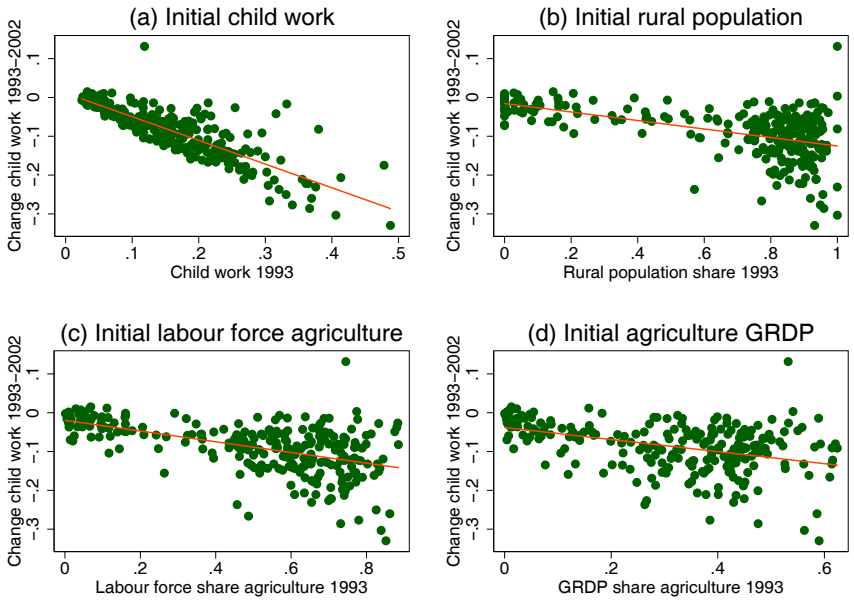

Figure 9: Initial district conditions and change in child work 1993-2002

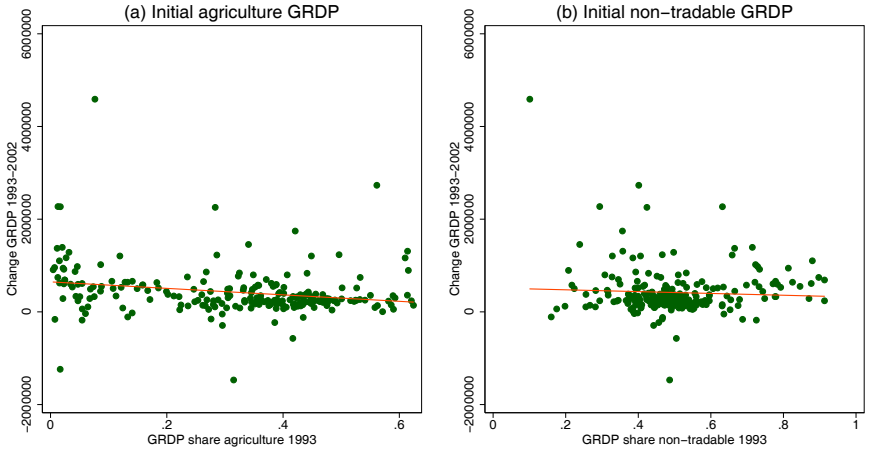

Figure 10: Initial district sector composition and change in district GDP 1993-2000

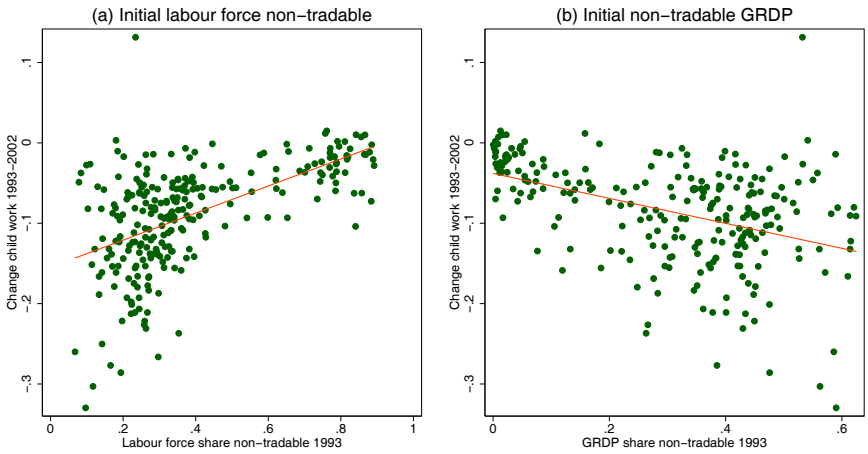

Figure 11: Initial district sector composition and change in child work 1993-2002