

Ninth Tranche of the Development Account Project

Enhancing the Contribution of Preferential Trade Agreements to Inclusive and Equitable Trade

BACKGROUND PAPER NO.2/2017

Preferential Trade Agreements with labour provisions and labour market outcomes: Evidence from Asia and the Pacific

Labour Provisions in Asia-Pacific Free Trade Agreements Part II

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The Development Account is a capacity development programme of the United Nations Secretariat aiming at enhancing capacities of developing countries in the priority areas of the United Nations Development Agenda. The ninth tranche of the Development Account is aimed at supporting Member States in designing and implementing strategies and policies towards sustainable, equitable and inclusive development. Trade is an important part of this process, as expanding trade and investment has driven growth in many developing countries, leading to major reductions in poverty and overall increases in welfare. However, substantial variations in performance among countries persist and, as a consequence, not all countries - and much less all groups and individuals within countries - have been able to benefit equally from trade. In particular, the least developed countries, landlocked developing countries, and other countries with special needs, have not benefited from trade as much as some other developing countries. In order for these countries to foster further economic and social development, they need better access to markets alongside further development of productive and supply capacity.

Towards that end, the project 'Enhancing the Contribution of Preferential Trade Agreements to Inclusive and Equitable trade', led by the Economic and Social Commission for Asia and the Pacific (ESCAP), in partnership with the Economic Commission for Africa (ECA) and the Economic Commission for Latin America and the Caribbean (ECLAC) aims to increase the potential benefits of preferential trade agreements for a set of developing countries identified to be in crucial need for assistance. The project aims to increase the capacity of these countries in identifying the potential benefits and costs of preferential trade agreements, increasing their means to effectively negotiate development-focused preferential trade agreements, and better utilize already negotiated concessions for their benefit. The identified beneficiary countries are: Burkina Faso, Guinea, Mauritius, and Senegal (Africa); Ecuador, Guatemala, Honduras and Jamaica (Latin America); and Bangladesh, the Islamic Republic of Iran, Mongolia, Myanmar, and Viet Nam (Asia-Pacific). The project will involve capacity building national workshops in the pilot countries, followed by a capstone regional dialogue for the different countries to share experiences and learn from another. Furthermore, the training materials, in addition to background documents and other materials derived from the workshops, will be made available online through a public knowledge sharing platform for all interested users as reference material.

The most significant output of the project will be enhanced capacity among government officials and trade negotiators to formulate inclusive development-friendly preferential trade agreements so that trade arising from such policies has inclusive and equitable results: improvements in labour standards and wages; the elimination of child labour; positive impacts on gender equality; and enhanced contribution to general welfare, in particular for marginalized excluded groups.

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Econometric Analysis

1.1. Introduction

In the first part (see Engen, 2017), it was stated that most labour provisions in PTAs are not supported by formal enforcement mechanisms, relying instead on self-compliance. However, this does not preclude these mechanisms from having a real effect on labour market outcomes. The aim of this section is to empirically test the impact of labour provisions in preferential trade agreements on three key labour market outcomes that make up the subject of most labour provision agreements:

- a) Child labour,
- b) Formal employment, and
- c) Inequality.

Child labour has been found to be a function of poverty (Krueger 1997; Basu and Van 1998), and is associated with worsening health outcomes (Roggero et al., 2007), as well as lower educational attainment (Akabayashi and Psacharopoulos 1999; Zabaleta 2011). Formal employment, unpaid family and own-account workers, are the most likely members of the workforce to fall into poverty. They are the least likely to have formal work arrangements, are the least likely to have social protection and safety nets to guard against economic shocks, and often are incapable of generating sufficient savings to offset these shocks. Inequality is of relevance because, as stated above, it is likely that low-skill and low-wage manufacturing industries would be more affected by trade liberalisation than their relatively more skilled counterparts. It is for this reason that the sustainability of trade policy, within a political economy framework, is likely to be a function of inequality (Barro, 2000).

The remainder of the section is structured as follows. The next subsection introduces the empirical model. Subsection 1.3 discusses the data, while Subsection 1.4 presents the empirical results. Subsection 1.5 contributes with policy implications, while the last subsection concludes.

1.2. Model

The econometric approach builds on macroeconomic studies that have looked at the nexus between trade and labour market outcomes.¹ Thus, the study estimates the following model:

$$LO_{i,t} = \alpha + \beta_1 T_{i,t} + \beta_2 PTA_{i,t} + \beta_3 PTA_{LP_{i,t}} + \beta_4 X_{i,t} + \mu_{i,t} \quad (1)$$

where the subscripts denote country i at time t . The term LO is a labour market outcome indicator described above. The term T is a vector of trade exposure variables (such as openness), PTA is the sum of preferential trade agreements signed by country i at time t , while PTA_{LP} is the sum of PTAs with labour provisions signed by each economy at a particular year, X is a vector of other controls, while $\mu_{i,t}$ is the error term. The inclusion of both PTA and PTA_{LP} is to clearly test the role that signing agreements with labour provisions tests after controlling for the number of agreements signed. Equation (1) is estimated using a fixed effects model.

Furthermore, Equation (1) is re-estimated using methods that account for endogeneity. This phenomenon is plausible because countries with, for example, high incidences of formal employment and low rates of child labour or inequality may choose to adopt more stringent labour standards to show political willingness against this problem in the international arena.

Developing countries with relatively stronger existing labour market outcomes, for example, may sign a PTA with labour provisions to attract more international investment to the manufacturing sector. Multinational firms may then see this as a relatively safer option to do business in a world where production practices are increasingly under scrutiny. Alternatively, richer economies may sign

¹ Another strand of the literature focuses on the opposite relationship (see Kucera and Sarna (2006)).

PTAs with labour provisions to ensure a more competitive labour market environment or to pressure poorer nations into improving their conditions. In both cases, better labour market outcomes incentivise economies to sign PTAs with labour provisions.

In these cases, the fixed effects regression technique produces biased and inconsistent estimates. Therefore, three different techniques are used to deal with endogeneity. First, the study adopts an instrumental variable (IV) approach. The second technique used to account for endogeneity is to employ lagged explanatory variables. The third technique is general method of moments (GMM) regression techniques.

The econometric techniques are discussed in more detail in Appendix 1.

1.3. Data

There are 49 economies in the ESCAP region. The list of countries in the study is in Appendix 2. The principal data requirement is some degree of time-variation in order to apply panel data techniques that control for unobserved, time-invariant characteristics, which could potentially explain labour market outcomes.² With variability, depending on the indicator, data is available over the period 1973 – 2016. Overall, the regression analysis uses data from 12-29 nations, depending on the indicator.

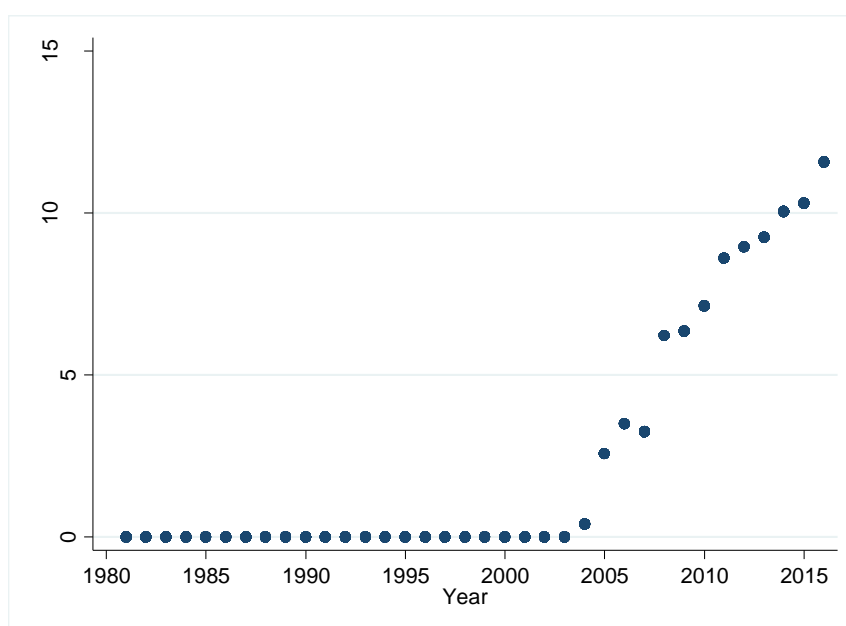
All data is obtained from internationally recognised data sources. The dependent variable in this study, *LO*, captures key components that are universally addressed in labour provisions – namely, formal employment, child labour, and inequality. Total formal employment as a per cent of total employment is available from the World Bank's World Development Indicators (WDI). These data are available across countries from 2008. Child labour, also available from WDI, is measured by children in employment (male and female), as a proportion of children aged 7-14. These data are generally available from 1997 for most developing countries. Inequality is measured using two indices. The first one is a standard Gini index from WDI. This index measures the extent to which the distribution of income among individuals or households within an economy deviates from perfectly equal. The Gini index ranges from 0 (perfect equality) to 100 (perfect inequality). The analysis also employs a UTIP-UNIDO Theil Index of manufacturing wage inequality, as a proxy for low-high skill wage differentials. This is available from the University of Texas Inequality project. These data are available from 1963 for most countries. As with the Gini, a Theil value equal to zero implies perfect equality, although this measure has no theoretical upper limit.

Due to data availability, child labour and the Gini index are linearly interpolated. This instance, interpolation treats child labour and the Gini index as a function of time. Therefore, it is assumed that changes in labour markets are slow.

Data on PTAs and PTAs with labour provisions is described in the previous section. Figure 1 shows that out of the agreements entered into force starting in 2004 (when the first agreement in the region with labour provisions was enacted), the share of those having provisions is 33 per cent. Figure 2 highlights that agreements with labour provisions are clustered around a number of countries, with South Korea and New Zealand exhibiting the most within the Asia Pacific region. The remaining explanatory variables used in the benchmark regressions build upon studies focusing on the determinants of labour market outcomes (Rodrik 1999; Palley 2004; Posso 2013). These variables discussed in Appendix 3.

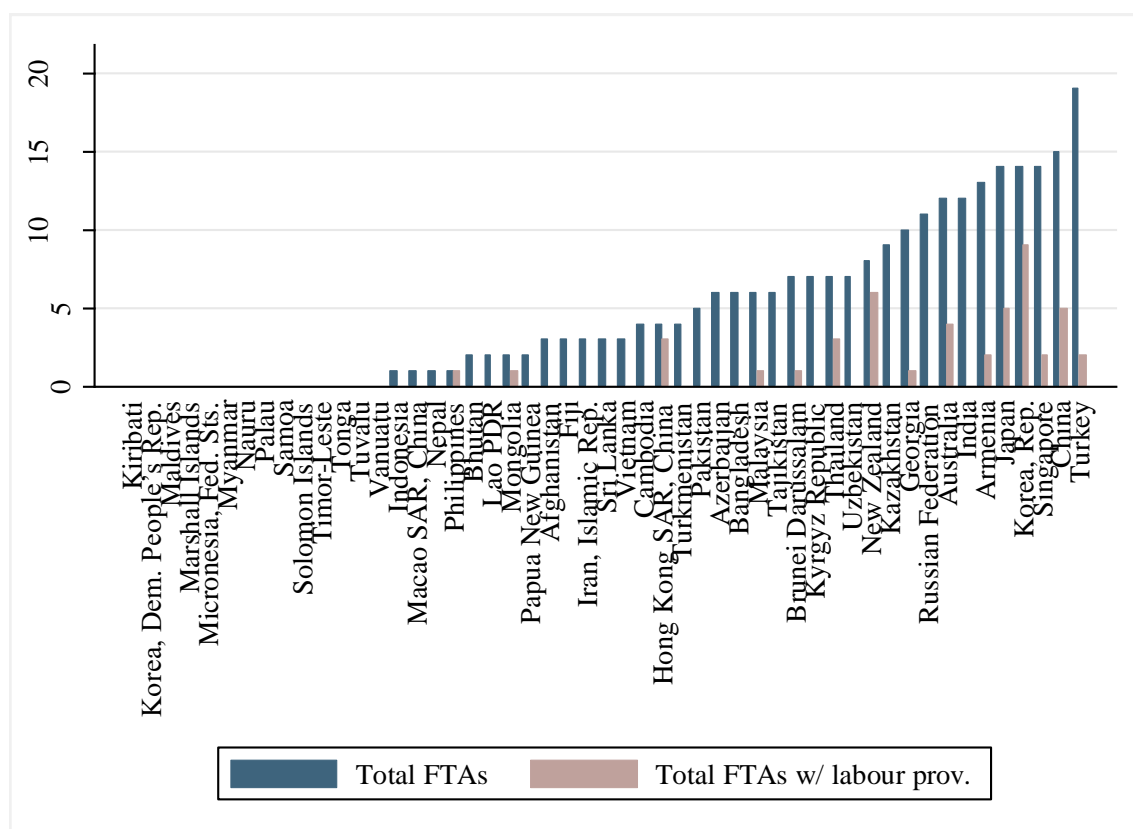
² Panel data is defined by multiple cases (countries) being observed at two or more time periods. The cross-sectional information (countries) is used to capture differences between economies, while the time-series or within-subject information reflects changes within countries over time. Panel data regression techniques allow the model to take advantage of these different types of information.

Figure 1: Percentage of PTAs with labour provisions, 1980-2015



Source: The author, based on Engen (2017).

Figure 2: Asia pacific nations with PTAs and PTAs with labour provisions, 2016.



Source: The author, based on Engen (2017).

1.4. Results

This section comprehensively examines the relationship between PTAs and PTAs with labour provisions with the key labour market indicators described in the previous section. Each subsection estimates macroeconomic models building on existing analytical work. To set the stage for the ensuing analysis, Table 1 provides a series of pairwise correlations.

Table 1 provides a series of encouraging results – the more PTAs that an economy has, the better its labour market outcomes. The total number of PTAs and PTAs with labour provisions are associated with lower male and female child labour and higher rates of formal employment for both men and women. However, economies with more PTAs also have higher manufacturing wage inequality, while those with labour provisions are associated with a higher Gini index.

Table 1: Pairwise correlations between key variables

	Child labour		Formal employment		Inequality	
	Male	Female	Male	Female	Gini index	Theil index [^]
Total PTAs	-0.26	-0.32	0.17	0.13	-0.13	0.17
Total PTAs with labour provisions	-0.04	-0.03	0.23	0.25	0.08	-0.03

Source: WDI; UTIP-UNIDO; the Authors.

Notes: [^] The Theil index refers to the UTIP-UNIDO index of manufacturing wage inequality.

Table 2 presents a summary of the regression results from the estimation of Equation (1) for the set of explanatory variables employed. Regression analysis allows us to look at the correlations in Table 1 after controlling for other influential factors. The table highlights that with the absence of child labour, PTAs and PTAs with labour provisions do not exhibit a statistically significant relationship with the labour market outcomes. Columns 1 and 2 highlight that PTAs with labour provisions are negatively and significantly associated with lower child labour. This gives impetus to the notion that these policy initiatives are having a positive effect on this important component.

Table 2: Labour market outcomes and provisions

	(1)	(2)	(3)	(3)	(4)	(5)
Indicator:	Child labour		Formality		Inequality	
	Girls	Boys	Women	Men	Gini	Theil
Total PTAs	-0.22	-0.45	-0.079	0.4	-0.069	-0.0009
	[-0.50]	[-0.81]	[-0.25]	[1.50]	[-0.31]	[-0.26]
Total PTAs w/ labour provisions	-5.74*	-8.34**	0.47	0.1	-0.78	-0.0078
	[-1.83]	[-2.26]	[0.68]	[0.31]	[-1.52]	[-0.53]
Country & year FE?	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	127	127	50	50	216	254
R-squared	0.58	0.53	0.81	0.76	0.38	0.32
Number of countries	18	18	17	17	19	13

Notes: *, **, and *** denote statistical significance at the 10, 5 and 1 per cent levels, respectively. Robust t-statistics in brackets. Child labour is defined as the per cent of girls or boys aged between 7 and 14 in employment. Child labour variables are linearly interpolated. Formal employment is defined as waged and salaried workers (male or female) as a percent of total employed workers (male or female). Gini Coefficients variables are linearly interpolated.

As mentioned above, it remains possible that economies with lower incidences of child labour are signing PTAs with labour provisions to highlight to competitors that they are actively engaged in fixing this problem. To begin to test whether this is the case, a Durbin-Wu-Hausman test for endogeneity is performed. The test marginally accepts the null hypothesis (p-value of 0.1068) that PTAs with labour provisions can be treated as exogenous. Given the relatively low p-value, endogeneity remains potentially problematic.

Therefore, as discussed above, this study adopts three techniques to address this potential problem. The first approach uses lags of potentially endogenous variables. Given that labour market outcomes move slowly, five-year lags of all potentially endogenous variables are used. It is difficult to justify using lags when the dependent variable has been linearly interpolated. Therefore, the lagged equations employ a five-year moving average of the child labour variables. The second approach is to use instrumental variables. PTAs with labour provisions is, in this case, instrumented using openness and total agreements. The third approach is to use internally generated instruments through a GMM process.

The results are in Table 3, below. The table shows that PTAs with labour provisions have, by and large, a statistically insignificant effect on child labour. The IV regressions in Columns 2 and 5 exhibit results that are consistent with those found above. Nevertheless, the two tests for the validity of using these instruments suggests that these results must be interpreted with caution. As a result, it is possible to only conclude that there is weak evidence in favour of the notion that PTAs with labour provisions can lower child labour in these developing nations.

Table 3: Child labour regressions, accounting for endogeneity

	(1)	(2)	(3)	(4)	(5)	(6)
Child labour indicator:	Girls	Girls	Girls	Boys	Boys	Boys
Model:	Lags (-5)	IV	GMM	Lags (-5)	IV	GMM
Total PTAs	0.65 [1.70]		-1.06 [-0.76]	0.46 [0.87]		-1.36 [-0.81]
Total PTAs w/ labour provisions	-1.29 [-1.47]	-27.4* [-1.93]	-22.5 [-0.57]	-1.68 [-1.60]	-31.5* [-1.89]	-20.3 [-0.46]
Country & year FE?	Yes	Yes	No	Yes	Yes	No
Other controls?	Yes	Yes	Yes	Yes	Yes	Yes
Observations	221	125	127	221	125	127
R-squared	0.45			0.38		
Number of countries	21	16	18	21	16	18
Kleibergen-Paap rk LM p-value		0.16			0.16	
Kleibergen-Paap rk Wald F stat		1.58			1.58	
AR(1) p-value			0.53			0.89
AR(2) p-value			0.44			0.53
Hansen test p-value			0.88			0.89

Notes: *, **, and *** denote statistical significance at the 10, 5 and 1 per cent levels, respectively. Robust t-statistics in brackets. Child labour is defined as the per cent of girls or boys aged between 7 and 14 in employment. Child labour variables in Columns 1, 3, 4 and 6 are linearly interpolated. Child labour variables in Columns 2 and 5 are five-year moving averages.

1.5. Policy implications

The regression analysis above suggests that labour provisions in PTAs are unlikely to improve formality and inequality, while only exhibiting weak evidence of a negative relationship with child labour. Therefore, the correlations exhibited in Table 1 are probably due to governments signing PTAs with labour provisions after their labour market outcomes have improved. There are two possible reasons why countries may want to do this.

The first one is to signal to other countries that their labour markets function well or are 'fair'. This may be a good strategy for developing nations competing in a world where labour standards are both internationally visible and increasingly important, particularly to consumers. Indeed, empirical evidence shows that countries that adopt labour standards attract greater foreign direct investment (Aggarwal, 1995; Kucera, 2002; Brown et al., 2004; Brown et al., 2011).

The second reason why nations may want to adopt labour standards in PTAs after their conditions have improved is to pressure other nations to improve their own labour markets. This may be an important strategy for governments worried about the state of affairs in other nations or worried about unfair competition or a 'race to the bottom' of labour standards in globalised environments. Indeed, many observers have proposed suggested that the latter is a prominent strategy employed by developed economies in order to deny developing countries the use of their comparative advantage (Bhagwati, 1995, Arestoff-Izzo et al., 2008).

1.6. Concluding remarks

This section undertakes an empirical analysis to investigate the relationship between PTAs with labour provisions and labour market outcomes in a selection of Asia Pacific economies. The basic analysis reveals that better labour market outcomes are positively correlated with PTAs and PTAs with labour provisions. However, a closer look at the data shows that PTAs and PTAs with labour provisions are unlikely to cause better labour market outcomes.

It is argued, therefore, that governments sign PTAs with labour provisions after labour market outcomes have improved. On the one hand, developing economies may use this approach to signal to other nations that they care about labour standards, which has been found to increase FDI. Developed economies, on the other hand, may choose to undertake these strategies in order to protect their own labour markets from a race to the bottom. This point has been made extensively in the political economy literature.

This highlights the complexity of the political economy of international trade and PTAs. PTAs with labour provisions are not necessarily tools to improve labour market outcomes. However, governments cannot ignore labour market issues, and signing provisions is a good way to highlight to civil society and consumers that they care about these factors.

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Appendix 1: Econometric approach

This study estimates the following model:

$$LO_{i,t} = \alpha + \beta_1 T_{i,t} + \beta_2 PTA_{i,t} + \beta_3 PTA_{LP_{i,t}} + \beta_4 X_{i,t} + \mu_{i,t} \quad (1.1)$$

where the subscripts denote country i at time t . The term LO is a labour market outcome indicator described above. The term T is a vector of trade exposure variables (such as openness), PTA is the number of preferential trade agreements signed by a country in a particular point in time, while PTA_{LP} is its PTAs with labour provisions counterpart. The vector X represents other controls, while $\mu_{i,t}$ is the error term. The error term in Equation (1.1) is decomposed into:

$$\mu_{i,t} = \delta_i + \lambda_t + \varepsilon_{i,t} \quad (1.2)$$

where δ_i is a country-specific dummy variable used to control for unobserved, time-invariant characteristics. For example, δ_i controls for the legal origin in country i , which could potentially determine key labour market outcomes. The term λ_t controls for omitted time-variant characteristics that affect all nations in a particular year. For example, λ_t controls for unobserved labour market effects of the Global Financial Crisis of 2007-8. Finally, the term $\varepsilon_{i,t}$ is an idiosyncratic error term.

In other words, Equation (1.1) is estimated using fixed effects regression techniques. The regressions will be run in STATA using the *xtreg* with the *fe* option. Formal econometric Hausman tests were used to ensure that this methodology provides the best linear unbiased estimator.

For robustness, the study also re-estimates Equation (1.1) using methods that account for endogeneity. Three different techniques are used to deal with this potential problem. First, the study adopts an instrumental variable (IV) approach. In this case, a variable is deemed to be a valid instrument if it is found to be correlated with $FTA_{LP_{i,t}}$, but not with the dependent variable. This is estimated in STATA using the *xtivreg2* command, with *fe*.

The second technique used to account for endogeneity is to employ lagged explanatory variables. In this instance, the following model can be estimated

$$LO_{i,t} = \alpha + \beta_1 LS_{i,t-n} + \beta_2 T_{i,t-n} + \beta_3 PTA_{i,t-n} + \beta_4 PTA_{LP_{i,t-n}} + \beta_5 X_{i,t-n} + \mu_{i,t} \quad (1.3)$$

In this case, it is assumed that all explanatory variables have been found to be endogenous and are, therefore, lagged by n years. The number of lagged years can be determined by a number of criteria, however, in this situation a lag of 1-5 years is employed.

Finally, endogeneity is also accounted with general method of moments (GMM) regression techniques. As with the transformations in Equations (1.1) and (1.2), this technique relies on lags of the endogenous variables as instruments (Arellano and Bond, 1991). This makes the endogenous variables pre-determined and, therefore, not correlated with the error term in Equation (1.1). GMM uses first-differences to transform Equation (1.1) into

$$\Delta LO_{i,t} = \beta_1 \Delta LS_{i,t} + \beta_2 \Delta T_{i,t} + \beta_3 \Delta PTA_{i,t} + \beta_4 \Delta PTA_{LP_{i,t}} + \beta_5 \Delta X_{i,t} + \Delta \mu_{i,t} \quad (1.3)$$

In this case, transforming the regressors by first differencing removes the fixed country-specific effect as it does not vary with time, as shown in Equation (4).

$$\Delta \mu_{i,t} = \Delta \delta_i + \Delta \lambda_t + \Delta \varepsilon_{i,t} = \Delta \lambda_t + \Delta \varepsilon_{i,t} \quad (1.4)$$

These regressions are run in STATA using the *xtabond2* command.

Appendix 2: Country list

Table 2.1: Country list (varies by indicator based on data availability)

Afghanistan	Kiribati	Papua New Guinea
Armenia	Democratic People's Republic of Korea	Philippines
Australia	the Republic of Korea	Russian Federation
Azerbaijan	Kyrgyzstan	Samoa
Bangladesh	Lao People's Democratic Republic	Singapore
Bhutan	Macao, China	Solomon Islands
Brunei Darussalam	Malaysia	Sri Lanka
Cambodia	Maldives	Tajikistan
China	Marshall Islands	Thailand
Fiji	Micronesia (Federated States of)	Timor-Leste
Georgia	Mongolia	Tonga
Hong Kong, China	Myanmar	Turkey
India	Nauru	Turkmenistan
Indonesia	Nepal	Tuvalu
Islamic Republic of Iran	New Zealand	Uzbekistan
Japan	Pakistan	Vanuatu
Kazakhstan	Palau	Viet Nam

Appendix 3: Data and full econometric analysis

This section shows tests of whether the relationship in Table 1 is robust to the inclusion of other explanatory variables as well as panel data regression techniques. The section treats each labour market outcomes separately for ease of exposition.

Child labour

Most previous work on the determinants of child labour rely on microeconomic data, such as household surveys. This study complements existing work with macroeconomic data in order to better understand the relationship between macroeconomic policies and child labour. The variables entering the regressions are informed by studies on the determinants of this phenomenon in developing economies (Chernichovsky 1985; Patrinos and Psacharopoulos 1997; Basu and Van 1998; Ray 2000a; Ray 2000b; Amin et al 2004; Emonds 2005; Edmonds and Pavcnik 2005; Beegle et al. 2006; Edmonds and Schady 2009; Steffen and Tobias 2015). Child labour is modelled as a function of income, proxied by GDP per capita, as well as enrolment rates in order to capture the opportunity cost of child work. Both variables are sourced from WDI. Rule of law is also included because in most instances child labour is illegal, therefore it is assumed that this problem is more likely to be observed in the absence of rule of law. This variable is sourced from the World Governance Indicators. The results of the regression analysis are presented in Table 3.1. Columns 1 and 2 model male child labour, while columns 3 and 4 use data for female child workers. The odd even columns present a base-line model, while the even numbered columns presented an augmented model that includes the trade variables – openness, total number of PTAs, and total PTAs with labour provisions.

Table 3.1: Child labour regressions, fixed effects models

	(1)	(2)	(3)	(4)
Child labour indicator:	Girls	Girls	Boys	Boys
Model:	Base-line	Augmented	Base-line	Augmented
GDP per capita	-4.09** [-2.87]	-4.13** [-2.88]	-4.63*** [-3.28]	-4.43*** [-3.01]
Primary enrolment rate	-0.31 [-1.56]	-0.34 [-1.70]	-0.39 [-1.53]	-0.43 [-1.69]
Secondary enrolment rate	-0.80*** [-3.36]	-0.76*** [-4.28]	-0.85** [-2.63]	-0.80*** [-3.44]
Rule of law	-4.21 [-0.84]	-2.16 [-0.55]	-6.34 [-1.08]	-4.13 [-0.79]
Openness		0.050 [0.85]		0.051 [0.76]
Total PTAs		-0.22 [-0.50]		-0.45 [-0.81]
Total PTAs w/ labour provisions		-5.74* [-1.83]		-8.34** [-2.26]
Country & year FE?	Yes	Yes	Yes	Yes
Observations	127	127	127	127
R-squared	0.54	0.58	0.50	0.53
Number of countries	18	18	18	18

Notes: *, **, and *** denote statistical significance at the 10, 5 and 1 per cent levels, respectively. Robust t-statistics in brackets. Child labour variables are linearly interpolated to maximise the number of available observations. Child labour is defined as the per cent of girls or boys aged between 7 and 14 in employment. Source: Authors' calculations on data from WDI and Worldwide Governance Indicators.

The findings in Table 3.1 confirm a number of *a priori* expectations. In particular, higher income is associated with lower child labour. This is consistent with most previous empirical work that find child labour to be a function of poverty. Additionally, higher rates of secondary enrolment rates are found to be associated with lower incidences of child labour. Child labour is, unsurprisingly, most

prominent amongst older children. As a result, if children are attending secondary school, they are probably less likely to be working.

Turning to the trade related variables, PTAs with labour provisions are found to be negatively and significantly associated with lower child labour. However, it remains possible that economies with lower incidences of child labour are signing PTAs with labour provisions to highlight to competitors that they are actively engaged in fixing this problem. The rest of this section adopts the three techniques discussed above to address this potential problem.

The first approach uses lags of potentially endogenous variables. Given that labour market outcomes move slowly, five-year lags of all potentially endogenous variables are used. It is difficult to justify using lags when the dependent variable has been linearly interpolated. Therefore, the lagged equations employ a five-year moving average of the child labour variables. The second approach is to use instrumental variables. PTAs with labour provisions is, in this case, instrumented using openness and total agreements, which are found to be statistically insignificant in Table 3.1 and are therefore acceptable instruments. The third approach is to use internally generated instruments through a GMM process. The results are in Table 3.2, below.

Table 3.2: Child labour regressions, accounting for endogeneity

	(1)	(2)	(3)	(4)	(5)	(6)
Child labour indicator:	Girls	Girls	Girls	Boys	Boys	Boys
Model:	Lags (-5)	IV	GMM	Lags (-5)	IV	GMM
GDP per capita	-3.02*	-3.97***	7.99	-2.35	-4.49***	7.61
	[-1.75]	[-3.48]	[1.43]	[-1.19]	[-3.59]	[0.87]
Primary enrolment rate	-0.29**	-0.37***	0.58***	-0.29**	-0.46***	0.54***
	[-2.44]	[-4.13]	[4.73]	[-2.10]	[-3.88]	[4.59]
Secondary enrolment rate	0.11	-0.89***	-0.73***	0.13	-0.95***	-0.66*
	[1.26]	[-9.03]	[-3.72]	[1.30]	[-7.14]	[-1.94]
Rule of law	-9.64*	-5.18	-13.2	-12.5**	-7.46*	-16.9
	[-1.96]	[-1.55]	[-0.66]	[-2.35]	[-1.90]	[-0.63]
Openness	0.054**		-0.19	0.066**		-0.20
	[2.58]		[-1.53]	[2.24]		[-1.14]
Total PTAs	0.65		-1.06	0.46		-1.36
	[1.70]		[-0.76]	[0.87]		[-0.81]
Total PTAs w/ labour provisions	-1.29	-27.4*	-22.5	-1.68	-31.5*	-20.3
	[-1.47]	[-1.93]	[-0.57]	[-1.60]	[-1.89]	[-0.46]
Country & year FE?	Yes	Yes	No	Yes	Yes	No
Observations	221	125	127	221	125	127
R-squared	0.45			0.38		
Number of countries	21	16	18	21	16	18
Kleibergen-Paap rk LM p-value		0.16			0.16	
Kleibergen-Paap rk Wald F stat		1.58			1.58	
AR(1) p-value			0.53			0.89
AR(2) p-value			0.44			0.53
Hansen test p-value			0.88			0.89

Notes: *, **, and *** denote statistical significance at the 10, 5 and 1 per cent levels, respectively. Robust t-statistics in brackets. Child labour is defined as the per cent of girls or boys aged between 7 and 14 in employment. Child labour variables in Columns 1,3, 4 and 6 are linearly interpolated. Child labour variables in Columns 2 and 5 are five-year moving averages. Rule of law is never lagged.

Source: Authors' calculations on data from WDI and Worldwide Governance Indicators.

Table 3.2 shows that PTAs with labour provisions have, by and large, a statistically insignificant effect on child labour. Table 3.3 employs lags of 1-4 years, confirming the findings in Table 3.2. The IV regressions in Columns 2 and 5 of Table 3.2, however, exhibit results that are consistent with those found above. Nevertheless, the Kleibergen-Paap rk LM p-value, suggests that the equation is underidentified. Moreover, the low Kleibergen-Paap rk Wald F-statistic confirms that these results

must be interpreted with caution. As a result, it is possible to only conclude that there is weak evidence in favour of the notion that PTAs with labour provisions can lower child labour in developing nations.

Table 3.3: Child labour regressions, lags of 1-4 years

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Child labour indicator	Girls	Girls	Girls	Girls	Boys	Boys	Boys	Boys
Number of lags:	1	2	3	4	1	2	3	4
GDP per capita	-	-	-	-	-	-	-	-2.95
	3.47***	3.36***	3.53**	3.45**	3.46***	3.21**	3.24**	
	[-3.50]	[-2.96]	[-2.71]	[-2.17]	[-3.40]	[-2.69]	[-2.15]	[-1.59]
Primary enrolment rate	-0.045	-0.11	-0.21*	-	-0.0084	-0.097	-0.20	-
				0.29**				0.30**
	[-0.49]	[-1.19]	[-1.99]	[-2.52]	[-0.082]	[-0.91]	[-1.69]	[-2.23]
Secondary enrolment rate	-0.15	-0.088	0.012	0.10	-0.14	-0.075	0.030	0.13
	[-1.11]	[-0.70]	[0.12]	[1.19]	[-0.98]	[-0.52]	[0.25]	[1.21]
Rule of law	-7.39	-7.63	-9.68	-11.1*	-9.77	-10.4	-12.5*	-
								14.3**
	[-1.26]	[-1.33]	[-1.69]	[-2.03]	[-1.56]	[-1.68]	[-2.04]	[-2.47]
Openness	-0.028	-0.021	0.010	0.045*	-0.038	-0.026	0.011	0.053
	[-0.54]	[-0.42]	[0.26]	[2.02]	[-0.63]	[-0.42]	[0.23]	[1.72]
Total PTAs	0.59**	0.68***	0.74**	0.69**	0.64**	0.68**	0.68*	0.58
			*					
	[2.68]	[3.32]	[2.98]	[2.36]	[2.62]	[2.66]	[2.05]	[1.48]
Total PTAs w/ labour provisions	0.63	-0.29	-0.25	-1.08	-0.088	-0.97	-0.83	-1.67
	[0.45]	[-0.25]	[-0.18]	[-1.06]	[-0.057]	[-0.73]	[-0.55]	[-1.46]
Country & year FE?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	214	217	220	221	214	217	220	221
R-squared	0.42	0.41	0.43	0.47	0.36	0.36	0.38	0.42
Number of countries	21	21	21	21	21	21	21	21

Notes: *, **, and *** denote statistical significance at the 10, 5 and 1 per cent levels, respectively. Robust t-statistics in brackets. Child labour is defined as the per cent of girls or boys aged between 7 and 14 in employment. Child labour variables are linearly interpolated. Rule of law is never lagged.

Source: Authors' calculations on data from WDI and Worldwide Governance Indicators.

Formal employment

In the absence of micro-level data, it is difficult to properly identify why individuals may choose informal labour opportunities over formal ones. As with child labour, most studies on informality are, consequently, based on microeconomic data. Most of these studies find that income may not necessarily matter because some informal workers are wealthier than salaried workers (Kucera and Roncolato, 2008). On the macroeconomic level, more developed economies generally have stronger unemployment insurance systems, and thus open unemployment can more readily provide an alternative to involuntary informal employment (Kucera and Roncolato, 2008). Similarly, less-educated workers have more limited formal employment prospects, therefore, the level of educational attainment should be positively associated with formality (Kucera and Roncolato, 2008). As a result, formality is modelled using GDP per capita (from WDI), the Kucera-Sari index of freedom of association and collective bargaining (FACB) rights, and educational attainment (from WDI).

The results are presented in Table 3.4. There are a number of counter-intuitive findings in this table. The first one is that formality is found to be negatively associated with economic development within these economies. This may be due to the limited available data on formality. In this sense, formality tends to be monitored more often and more comprehensively in richer than poorer

economies, as such the values in the table are only reflecting that nuance. Turning to PTAs and PTAs with labour provisions, they are found to have a statistically insignificant relationship with formality. Given the very limited number of observations, it was decided not to show robustness exercises using lags. Suffice to say that the results are consistent with those in Table 3.4.

Table 3.4: Determinants of formal employment, fixed effects regressions

	(1)	(2)	(3)	(4)
Model:	Base-line	Augmented	Base-line	Augmented
Formal employment indicator:	Women	Women	Men	Men
GDP per capita	-0.58*** [-4.86]	-0.50** [-2.63]	-0.27* [-1.92]	-0.32** [-2.75]
Educational attainment	-0.30* [-1.78]	-0.28* [-1.85]	0.081 [0.91]	0.15 [1.31]
Kucera-Sari Indicator	0.26** [2.34]	0.27* [2.04]	-0.018 [-0.22]	-0.020 [-0.18]
Openness		0.0100 [0.65]		0.028* [1.99]
PTAs		-0.079 [-0.25]		0.40 [1.50]
PTAs w/ labour provisions		0.47 [0.68]		0.10 [0.31]
Country & year FE?	Yes	Yes	Yes	Yes
Observations	50	50	50	50
R-squared	0.81	0.81	0.68	0.76
Number of countries	17	17	17	17

Notes: *, **, and *** denote statistical significance at the 10, 5 and 1 per cent levels, respectively. Robust t-statistics in brackets. Formal employment is defined as waged and salaried workers (male or female) as a percent of total employed workers (male or female). Educational attainment is measured separately for women and men in female and male regressions, respectively. Educational attainment variables are linearly interpolated.

Inequality

Posso (2013b) and Posso and Soans (2014) present a set of intuitively appealing regressors to explain movements in inequality within countries. The benchmark regression includes: (a) a labour productivity indicator— higher productivity is expected to lead to higher real skilled and unskilled wages; (b) log per capita GDP, as a proxy for structural determinants correlated with levels of income— countries with higher income are expected to have higher real wages; (c) log consumer price index (price), to indicate cost-of-living differences not captured by exchange-rate conversions— countries with a higher cost of living are expected to exhibit higher real wages measured in US dollars; (d) schooling— higher levels of schooling of the average worker are expected to result in higher average real wages, (e) the proportion of the population living in urban areas— higher urbanization is expected to result in higher real wages due to congestion costs; (f) openness— more open economies create more jobs, which increases demand for labour and raises average wages, and (g) a country's level of democracy, measured using the revised combined polity score— Rodrik (1999) argues that more democratic economies exhibit higher wages. Aside from Polity, all data is sourced from WDI. Polity is sourced from the Polity Project - Systemic Peace.

The results are presented in Table 3.4. Columns 1 and 2 present the results using the Gini index, while Columns 3 and 4 use the Theil index. As above, the odd and even numbered columns present the base-line and augmented models, respectively.

Columns 1 and 2 indicate that richer economies are less unequal, a finding that is consistent with a large body of empirical evidence. Columns 3 and 4, instead, highlight that inequality decreases with educational attainment and democracy. In all cases, the trade related variables are found to be statistically insignificant. Furthermore, exercises using IV, GMM and lags find similar results.

Table 3.4: Determinants of inequality, fixed effects regressions

	(1)	(2)	(3)	(4)
Model:	Base-line	Augmented	Base-line	Augmented
Inequality indicator:	Gini	Gini	Theil	Theil
GDP per capita	-0.98** [-2.14]	-1.01** [-2.19]	-0.00069 [-1.15]	-0.00040 [-0.63]
CPI	0.024 [0.55]	0.0093 [0.19]	0.00013 [0.44]	0.000031 [0.12]
Educational attainment	0.011 [0.13]	0.044 [0.52]	-0.0018*** [-4.05]	-0.0016*** [-3.33]
Urbanisation	-0.018 [-0.15]	0.019 [0.17]	0.00097 [1.40]	0.00090 [1.14]
Democracy	-0.013 [-0.21]	-0.023 [-0.31]	-0.00091** [-2.46]	-0.00088*** [-3.08]
Openness	0.011 [0.57]		0.00012 [1.18]	
PTAs		-0.069 [-0.31]		-0.00086 [-0.26]
PTAs w/ labour provisions		-0.78 [-1.52]		-0.0078 [-0.53]
Country & year FE?	Yes	Yes	Yes	Yes
Observations	216	216	254	254
R-squared	0.37	0.38	0.33	0.32
Number of countries	19	19	13	13

Notes: *, **, and *** denote statistical significance at the 10, 5 and 1 per cent levels, respectively. Robust t-statistics in brackets. Educational attainment and Gini Coefficients variables are linearly interpolated.

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