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The Impact of Exports on Income Inequality in Developing Countries

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Abstract Trade exhibits two contrasting effects on income inequality in developing countries (DCs). On the one hand, trade openness benefits unskilled labor in preference to skilled labor and capital (the Stolper–Samuelson effect). On the other hand, trade openness increases the demand for skilled (rather than unskilled) labor inputs (the skill premium effect). Recent studies that provide stronger support for the skill premium model have focused on wage inequality or have chosen higher-income DCs. We test the effect of export growth on income inequality for 70 lower income DCs and 36 higher-income DCs, using an unbalanced panel dataset for the 1971–2012 period. The results show that the export/GDP ratio has a negative effect on income inequality for lower-income DCs, but no significant effect was found for higher-income DCs.

Keywords: exports, income inequality, skill premium, Stolper–Samuelson theorem
JEL classification: F16, J46, O15

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Introduction

Trade exhibits two contrasting effects on income inequality in developing countries. On the one hand, trade openness benefits unskilled labor in preference to unskilled labor and capital because developing countries specialize in unskilled labor-intensive goods, which leads to less inequality (the Stolper–Samuelson effect). On the other hand, trade openness increases the demand for skilled labor inputs in preference to unskilled inputs, which promotes inequality (the so-called skill premium effect). Although more recent studies seem to favor the skill premium model over the Stolper–Samuelson model, the evidence for the skill premium model depends strongly on several factors. First, in studies of the effect, the dependent variable is typically wage inequality, rather than income inequality. Second, even when income inequality is the dependent variable, the model fits only developing countries (DCs) with relatively higher incomes.

We argue that the Stolper–Samuelson model is well suited to lower-income DCs for two reasons. First, export growth results in additional income by creating jobs that are filled by previously unemployed or underemployed workers. Since the proportion of the labor force that is unemployed or underemployed is larger in lower-income DCs relative to higher-income DCs, the effect of export growth on unskilled job creation is expected to be enhanced in lower-income DCs. Second, the skill premium effect on wage inequality is weaker in lower-income DCs because there is little scope for skill intensification. The high rate of unemployment/underemployment in lower-income DCs also prevents increased demand for skilled labor from driving wages up. Thus, the strong effect of exports on creating unskilled jobs and the weak skill premium effect together contribute to a reduction in income inequality in lower-income DCs.

We test the effect of the export/GDP ratio (as a marker of trade openness) on income inequality for lower-income DCs (n = 70) and higher-income DCs (n = 36), using an unbalanced panel dataset for the

1971–2012 period. Data for this analysis were compiled from the Standardized World Income Inequality Database (SWIID) and the World Development Indicators Database. The next section discusses the conceptual and empirical bases of our argument. The third section elaborates on the dataset and panel design. The fourth section presents the major findings of the panel analysis. The final section interprets the findings and discusses their implications.

Export and Income Inequality in Lower Income Developing Countries

Previous research on trade openness and income inequality has presented competing theories and provided mixed evidence (Reuveny and Li 2003, Lee, Nielsen, and Alderson 2007, Meschi and Vivarelli 2009, Ha 2012, Franco and Gerussi 2013, Goldberg and Pavcnik 2007, Milanovic 2005). On the one hand, the Stolper–Samuelson model predicts that trade openness will benefit unskilled labor, which is abundant in DCs, more than it will benefit unskilled labor and capital. If so, this will result in lower inequality. The Stolper–Samuelson model has been criticized for adopting narrow assumptions and because evidence of labor reallocations across sectors that benefit or suffer from trade liberalization has been scarce (Goldberg and Pavcnik 2007, 58-61). On the other hand, the skill premium model claims that trade openness bolsters demand for skilled labor, which is used to produce exports, and thus widens wage inequality between skilled and unskilled labor (Feenstra and Hanson 1996, Wood 1997). While more recent studies offer evidence for the skill premium model (Meschi and Vivarelli 2009, Ha 2012, Franco and Gerussi 2013, Goldberg and Pavcnik 2007), most evidence is for wage inequality (Harrison, McLaren, and McMillan 2011), which fails to fully account for unemployed/underemployed workers, rather than overall income inequality.

Even in studies that explain income inequality (in contrast with wage inequality) in terms of the skill-premium model, the results depend strongly on the specific circumstances. In some studies, initial research did not find any significant effect of trade openness (or export ratio) on income

inequality; significance was obtained only after trade was decomposed into exports and imports and by destination or origin. Moreover, those results applied to only middle-income countries, and the effects were not found for lower-income countries (Meschi and Vivarelli 2009, Franco and Gerussi 2013). In a similar vein, Lin and Fu (2016) demonstrated that the Stolper–Samuelson model (resp., the skill premium model) could be applied to autocracies (resp., democracies) because of the intensiveness of primary (resp., intermediate) goods in export.

Prior research has thus demonstrated that export growth increases wage inequality in middle-income countries (and higher-income DCs) through an intensification of the skill premium. The finding that the skill premium model is better suited to higher-income DCs than to lower-income DCs is consistent with the model's logic. However, this research has left unanswered the question of whether the Stolper–Samuelson model better explains income inequality in lower-income DCs. There are two reasons to suspect that trade openness (in general) and export share of GDP (in particular) contribute to income equality in lower-income DCs.

First, export growth results in previously unemployed or underemployed workers newly receiving income. Trade openness has been found to contribute to job creation (Winters, McCulloch, and McKay 2004, Hasan et al. 2012), albeit mildly (Winters, McCulloch, and McKay 2004, 98-99).[1] In DCs, the job market is characterized by the existence of a huge informal sector in which people are underemployed, i.e., not formally employed but working on an irregular basis for low wages. The surplus unskilled labor that is found in the informal sector stems from a large labor force in agriculture in lower-income rather than higher-income DCs. The effect of export growth on unskilled job creation is thus expected to be more pronounced in lower-income DCs. Second, the skill premium effect on wage inequality is weaker in lower-income DCs; the results of the previous studies imply this. This occurs because when the unemployment/underemployment rate is high, as is the case in lower-income DCs, an increase in demand for skilled labor is less prone to pushing up wages. Thus,

for lower-income DCs, a stronger effect of export on unskilled job creation and a weaker effect of the skill premium on wage inequality together contribute to a reduction in income inequality. As Figure 1 indicates, export growth creates jobs for previously unemployed/underemployed workers and thereby reduces income inequality; the magnitude of this effect is the size of Area A. A higher skill premium increases income inequality by the size of Area B, but its size relative to that of Area A is smaller for lower-income DCs than for higher-income DCs.

[Insert Figure 1 here]

Although there is scant evidence on the effect of import growth on income inequality, the relevant literature indicates that increasing import levels widens inequality. The import sector in DCs is mainly intermediate and capital goods. An increase in imports may therefore favor skilled labor, which can make use of such goods, over unskilled labor (Griliches 1969, Krusell et al. 2000, Duffy, Papageorgiou, and Perez-Sebastian 2004). At the same time, however, import growth in DCs is often driven by export growth because the latter requires more intermediate and capital goods to be imported from developed countries. It is therefore necessary to properly attribute some of the import growth to export growth. The overall negative effect of the import ratio on income inequality can be delineated by including both exports and imports in the estimation model.

Research Design

Data and samples

This study separately tests the effect of the export/GDP ratio on income inequality for higher- and lower -income DCs using an unbalanced panel dataset for the 1971–2012 period compiled from the

Standardized World Income Inequality Database (SWIID) and the World Development Indicators Database. DCs were defined as countries whose nominal GDP per capita as of 2010 was below $25,000 ($N$ = 106).[2] The DCs were then divided into (1) higher-income DCs, whose nominal GDP per capita was $5,000 ($n$ = 36) or above, and (2) lower-income DCs whose, nominal GDP per capita was below $5,000 ($n$ = 70). See Table 1 for the sample of countries.

[Insert Table 1 here]

Panel design

The panel analysis adopted a fixed effects (FE) model with a lagged dependent variable (LDV) due to its better match with the current dataset relative to other models.[3] Alternatives to the FE model, such as a random effects (RE) model or panel-corrected standard errors (PCSE) estimation, were unsuitable due to the dataset's properties. Specifically, an RE model was not chosen because the Hausman test rejected the null hypothesis that the coefficients estimated by the efficient RE estimator are the same as those estimated by the consistent FE estimator. PCSE estimation was not chosen because, although it is appropriate for a panel with a limited number of cross-sections over a long time period, it is unsuitable for a panel having more cross-sections than time points (Beck and Katz 1995), which is the case here.

The FE model mitigates the potential problem of selection bias arising from unbalanced panels such as this dataset (here, observations per country differ in number) because the country-specific intercept, which represents unobserved effects, captures the idiosyncratic likelihood of missing observations (Wooldridge 2013, 473-4). Furthermore, the FE model can accommodate using an LDV, which has three appealing properties in the context of the current research. First, a model with an LDV is

appropriate for situations where the effect of a change in an independent variable is distributed over time. Second, although the inclusion of an LDV makes the FE (and the ordinary least squares) estimator inconsistent, the FE (but not the ordinary least squares) estimator becomes consistent when *T* becomes large. An appropriate value for *T* is 20 or more, according to Beck and Katz (2011, 342), while Baltagi (2008, 148) cites an example of relatively consistent estimators when *T* reaches 30.[4] The mean number of observations per country in the dataset is 14.7 for the lower-income DCs and 22.2 for the higher-income DCs, and so potential estimator inconsistency should be at an acceptable level.[5] Third, misspecification in the LDV model would lead to underestimation, rather than overestimation, of regression coefficients (Beck and Katz 2011, 336).[6] This tendency for underestimation reduces the chance of erroneously asserting significant impacts for the variables of interest.

In sum, the FE model with an LDV has three major advantages over other models. First, it enables addressing the question of whether socioeconomic and political changes account for incremental change in each country's income distribution. Second, it controls for country-specific conditions, such as colonial experiences, and path dependence more generally; it also reduces the selection bias inherent in unbalanced panels. These features of the model well serve the major interest of this study, which is to determine the impact of political and economic reform on income equality in emerging democracies and not to undertake a comparison of income equality among countries at different levels of democracy. Third, taking conservative estimates of variable coefficients diminishes the chance of a false claim of new evidence.

The FE model with a LDV used here takes the following form:

$$DV_{i,t} = \alpha + \beta_1 (DV_{i,t-1}) + \beta_2 (IV1_{i,t-1}) + \beta_3 (IV2_{i,t-1}) + \ldots + \beta_k (IVh_{i,t-1}) + \upsilon_i + \gamma_t + \varepsilon_{i,t}$$

where $DV_{i,t}$ is a measure of the dependent variable in country i in year t, $DV_{i,t-1}$ is an LDV, $IV1_{i,t-1}$, $IV2_{i,t-1}$, ... $IVh_{i,t-1}$ are h independent variables in country i in year t-1, α is the intercept, β_k are k coefficients to be estimated, υ_i are fixed group effects, γ_t are fixed time effects, and $\varepsilon_{i,t}$ is a white-noise error term.

Variables

Table 2 presents the variables and their data sources. All independent variables were lagged by one year. The dependent variable, the after-tax Gini coefficient, is derived from the SWIID compiled by Solt (2009), who estimated before-tax ("market") and after-tax ("net") Gini coefficients as well as changes in the Gini coefficient after taxation ("redistribution") using the World Income Inequality Database (UNU-WIDER 2008), the Luxemburg Income Study Database (LIS 2008), and more recent country-specific databases. In this study, the estimated before-tax Gini coefficient and the estimated redistribution were also used as alternative dependent variables; however, the estimated after-tax Gini coefficient produced the most substantive results. The data source for the independent variables is the World Development Indicator Dataset.

[Insert Table 2 here]

The variable of interest is the export/GDP ratio. Although trade openness can be used instead, the export ratio is more relevant to the core argument of both the Stolper–Samuelson and skill premium models discussed above. In addition to the export ratio, the following variables were used as correlates of income inequality (expected direction of effect shown in parentheses, + indicates widening):

import/GDP ratio (+), the logarithm of the real GDP per capita (+) and its square (−), secondary school enrollment (−), the young population (−), the elderly population (+), urban population (−), and net inflow of FDI (+). Year dummies control for concurrent shocks (e.g., a world economic crisis) and long-term trends (e.g., growth of neo-liberalism).

Among these variables, the logarithm of the real GDP per capita (+) and its square (−) deserve elaboration. Kuznets (1955) argued that economic development has an inverted-U curve effect on income inequality, but there have been few panel studies to support his theory; most of the supporting evidence is derived from cross-sectional studies prone to unobserved country-specific effects [see the review by Tam (2008)][7]. The net inflow of FDI, accompanied by technological transfer, is expected to increase demand for skilled labor and thereby to widen wage disparity, according to the skill premium model (Goldberg and Pavcnik 2007, Ha 2012).

Before testing the main hypothesis, we examine the assumption that an increase in export/GDP ratio enhances employment opportunities in DCs. Drawing on the previous argument, employment opportunities were separately measured by unemployment and underemployment. Unemployment is conventionally defined as the share of the labor force that is without work but available for and seeking employment. Unemployment thus defined, however, does not fully represent employment opportunities across DCs at different levels of development. In some DCs that have unemployment benefits and other types of social safety nets, people can afford to remain unemployed. In other DCs that lack such social protection mechanisms, people without jobs prefer to work even informally on an irregular basis for low wages.[8] Such situations encourage underemployment as disguised unemployment in the informal economy. The subsample mean of the panel mean unemployment calculated from the dataset is almost the same for the higher-income DC subsample (10.0) and the lower-income subsample (10.6). This suggests that unemployment statistics undervalue the gravity of job situations in lower-income DCs.

Underemployment was captured by sector dualism, an indicator of economic informality which is calculated as the absolute difference between the percentage of the labor force in agriculture and agriculture as a share of GDP (Huber et al. 2006, Lee, Nielsen, and Alderson 2007, Nielsen et al. 1995). In essence, it reflects the level of labor redundancy, i.e., how much labor is used to produce value added in the agricultural sector, relative to that in the nonagricultural sector.[9] The absolute value is used to ensure that the value would be positive even if the agricultural sector was more productive than the nonagricultural sector (Nielsen et al. 1995, 680). The labor force in the agriculture is the major source of underemployed unskilled labor in the nonagricultural sector. The mean income difference between the nonagricultural and agricultural sectors, mirrored by sector dualism, pulls the surplus unskilled labor in agriculture into the nonagricultural informal sector; the greater the sector dualism, the larger the underemployment. The subsample mean of the panel mean sector dualism is much higher in the lower-income DCs (26.3) than in the higher-income DCs (9.7).

Results

Exports and job creation

The FE model with an LDV estimated the impact of exports on unemployment and underemployment. Because the dependent variables are direct observation (unlike income inequality, which is estimated), multiple imputations were not used. Table 3 shows the results of estimation of unemployment. The export/GDP ratio has a negative effect on unemployment for higher-income but not for lower-income DCs. One might attribute the difference to the smaller size of the lower-income DC subsample due to a significant lack of unemployment data; the coefficient signs of the export/GDP ratio are the same for the higher- and lower-income DC subsamples. It is more likely, however, that unemployment statistics do not sufficiently represent job opportunities in lower-income DCs. Even in higher-income DCs, other independent variables show that the

unemployment variable partly reflects the level of social welfare. The higher the GDP per capita logged, the higher the unemployment. The school enrollment ratio also positively affects unemployment indicating that skilled workers may voluntarily remain unemployed while seeking better jobs.

The results for underemployment, as captured by sector dualism, are presented in Table 4. The export/GDP ratio and import/GDP ratio variables have negative and positive effects, respectively, on sector dualism at significant levels for lower-income DCs; for higher-income DCs, they do not have any significant effects. The secondary school enrollment ratio and urban population also improve informal sector employment opportunities by reducing sector dualism in accordance with the theoretical expectations. These findings imply that an increase in export reduces labor redundancy in the informal sector and enhances its employment conditions (job regularity and wage levels). Overall, the results support the assumption that export growth contributes to greater employment opportunities for (mostly unskilled) irregular workers in lower-income DCs and (more skilled than unskilled) regular workers in higher-income DCs.

[Insert Table 3 here]

[Insert Table 4 here]

Exports and inequality reduction

With regard to the hypothesis, the results of multiple imputations using the FE model with an LDV are presented in Table 5. Three models were run for each of three samples: all DCs (Models 1 through 3), higher-income DCs (Models 4 through 6), and lower-income DCs (Models 7 through 9). Among the independent variables, estimation was inconsistent for the young population, the elderly population, and inflation for different models within the same sample. The square of the logarithm of per capita GDP, although consistently of the expected sign, was not statistically significant for any model. Therefore, these four variables were dropped from the final models and are not reflected in the results section.

[Insert Table 5 here]

The export/GDP ratio had no significant effect on income inequality for higher-income DCs (Models 4 and 6) but a significantly negative effect for lower-income DCs (Models 7 and 9). For lower-income DCs, the effect of exports was weaker when the net inflow of FDI was included in the model (Model 9), but it was still significant at the 0.1 level. These results are consistent with our hypothesis that an increase in the export share of GDP reduces income inequality in lower-income DCs but not higher-income DCs. It is possible that the content of the exports matters. An increase in mineral exports, for example, may shift income distribution toward more inequality because it is likely to concentrate export revenues within a capital-intensive industry rather than generate jobs for unskilled workers.[10] To check this possibility, first, exports were divided into mineral and non-mineral exports, which were tested separately in the above models. Second, the impact of exports was tested using subsamples with high and low mineral export ratios. These alternative specifications, however, did not yield statistically significant results.

Regarding other findings, FDI displayed the expected effect for lower-income DCs but no significant effect for higher-income DCs. Since FDI flight, which has often happened in higher-income DCs, affects the lower-income earners and unskilled workers more severely than it does higher-income and skilled workers (Dong 2014, 253-258), both highly positive and highly negative levels of net inward FDI might increase income inequality in higher-income DCs. Imports had the expected negative sign for five of the six models, but was not statistically significant for any model.

Sociodemographic variables also present interesting contrasts between higher- and lower-income DCs, although only one (urban population) was statistically significant for one model. The coefficient for the secondary school enrollment ratio, for example, was positive for higher-income DCs and negative for lower-income DCs, suggesting that when the level of education is already high, further advances in education benefit the rich rather than the poor. Since secondary education helps to provide skilled labor, this finding gives support to the skill premium model for higher-income DCs. The coefficient for the urban population rate was negative for higher-income DCs and positive for lower-income DCs. In predominantly rural lower-income DCs, internal migration apparently aggravates the urban‑rural disparity; in urbanized higher-income DCs, the absorption of the rural population into cities helps to deplete the sources of surplus labor.

Conclusion

Analysis revealed that an increase in the export/GDP ratio enhances employment opportunities for (mostly unskilled) irregular workers in lower-income DCs and (more skilled than unskilled) regular workers in higher-income DCs. Because of these divergent impacts of export growth on job creation, a greater export/GDP ratio reduces income inequality for lower-income DCs but has no significant effect for higher-income DCs. This is because expanded job opportunities for mostly unskilled

workers in lower-income DCs raise the income level of the poorer group of the population whereas improved employment conditions for substantially skilled workers in higher-income DCs drive up the skill premium and increase inequality. In other words, the Stolper–Samuelson effect is more congruous with lower-income than higher-income DCs. Also, there was a strong finding that net inflow of FDI widens income inequality in lower-income DCs but not in higher-income DCs. This discrepancy might be attributed to the suggested U-curve effect of FDI on income inequality in higher-income DCs that have repeatedly suffered from economic crises. This implies that both high-level capital inflows and massive capital outflows following economic crises can exacerbate income inequality.

Endnotes

[1] Winters, McCulloch, and McKay (2004) also point out that Asian countries that liberalized trade when unskilled labor was still abundant reduced income inequality whereas in Latin America trade liberalization after labor skill intensification did not promote equality.

[2] The year 2010 was used because it has the largest set of cross-country observations in the dataset. The level of 25,000 US dollars was chosen for the sample so as to exclude the 15 original member countries of the European Union.

[3] The research design section draws on Kawanaka and Hazama (2016, 79-82).

[4] Baltagi (2008) also shows that a RE model may be erroneously rejected by the Hausman test when endogeneity is present and that a two-stage least-squares RE model is a better alternative in such circumstances.

[5] The robustness check for endogeneity using the Blundell and Bond System generalized method of moments (GMM) estimator was initially considered. It is a superior extension of the Arellano and Bond GMM estimator, especially when the number of time points is low (Baltagi 2008, 160–162). However, using the SWIID for model estimation requires multiple imputations to incorporate into an analysis the standard errors for SWIID estimates. In STATA, multiple imputations are possible only for FE or RE models, not for GMM estimators.

[6] Similarly, Angrist and Pischke (2009, 243-6) recommends adopting the FE and LDV models, respectively, to obtain the upper and lower bounds of the estimates (Angrist and Pischke 2009).

[7] Kuznets (1955) suggested that economic growth initially increases inequality much more in

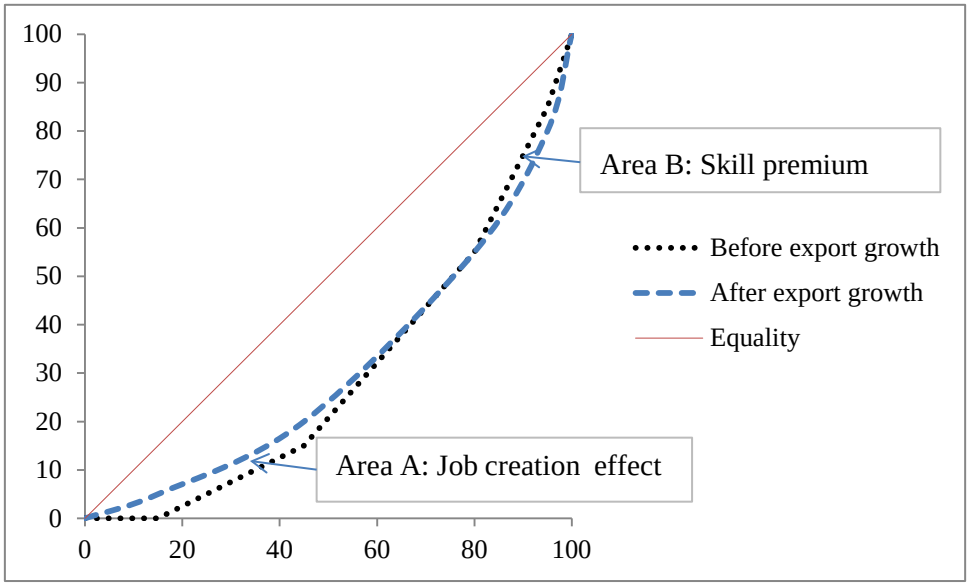
developing than developed countries because the dearth of the middle class in the former results in wealth concentrating in the hands of the rich.

[8] See the detail for unemployment statistics in http://data.worldbank.org/indicator/SL.UEM.TOTL.ZS.

[9] It is the inverse of the mean income difference between the agricultural and nonagricultural sectors.

[10] The author owes this insight to Shin-ichi Takeuchi.

Figure 1. Lorenz Curves: Before and after Export Growth



Note: Hypothetical Lorenz curves before and after an increase in exports' share of the GDP. Area A represents the reduction in income inequality caused by job creation, and Area B represents the increase in income inequality caused by higher wages for skilled labor

Table 1 Sample of Countries (*N*=106)

Lower-income countries (n = 70)	Higher-income countries (n = 36)
Albania	Argentina
Algeria	Azerbaijan
Angola	Belarus
Armenia	Botswana
Bangladesh	Brazil
Benin	Bulgaria
Bolivia	Chile
Burkina Faso	Colombia
Burundi	Costa Rica
Cambodia	Croatia
Cameroon	Czech Republic
Cape Verde	Dominican Republic
Central African Republic	Estonia
Chad	Gabon
China	Hungary
Comoros	Kazakhstan
Cote d'Ivoire	Korea, South
Ecuador	Latvia
Egypt	Lebanon
El Salvador	Lithuania
Ethiopia	Malaysia
Gambia	Mauritius
Georgia	Mexico
Ghana	Panama
Guatemala	Peru
Guinea	Poland
Guinea-Bissau	Portugal
Guyana	Romania
Honduras	Russia
India	Slovenia
Indonesia	South Africa

Jamaica
Jordan
Kenya
Kyrgyzstan
Lesotho
Macedonia
Madagascar
Malawi
Mali
Mauritania
Mongolia
Morocco
Mozambique
Namibia
Nepal
Nicaragua
Niger
Nigeria
Pakistan
Papua New Guinea
Paraguay
Philippines
Rwanda
Senegal
Sierra Leone
Sri Lanka
Sudan
Swaziland
Syria
Thailand
Togo
Tunisia
Uganda
Ukraine
Uzbekistan
Vietnam
Suriname
Trinidad and Tobago
Turkey
Uruguay
Venezuela

Yemen

Zambia

Zimbabwe

Table 2. Variables and Data Sources

Variable name	Source
Gini net (Gini after tax)	Solt 2009
GDP per capita logged, constant USD	World Bank
GDP per capita logged, current USD	World Bank
Inflation (%)	World Bank
Secondary school enrollment ratio (%)	World Bank
Urban population (% of total)	World Bank
Ratio of exports to GDP	World Bank
Ratio of imports to GDP	World Bank
Foreign direct investment, net inflows (% of GDP)	World Bank
Unemployment (% of total labor force)	World Bank
Labor force in agriculture (% of total labor force)	World Bank
Agriculture as a share of GDP	World Bank

Table 3. Testing the Effect of Exports on Unemployment

	Income groups defined by GDP per capita $ in 2010					
	5000 ≦ Higher income < 25000			Lower income < 5000		
	(1)	(2)	(3)	(4)	(5)	(6)
L.Unemployment total (% of total labor force)	0.840***	0.827***	0.838***	0.717***	0.699***	0.697***
	(0.0274)	(0.0277)	(0.0273)	(0.0381)	(0.0361)	(0.0378)
L.GDP per capita logged, constant US$	1.005*	0.948*	0.994*	0.872	0.652	0.689
	(0.567)	(0.575)	(0.565)	(0.556)	(0.567)	(0.575)
L.School enrollment_secondary	0.0257**	0.0320***	0.0235**	0.00359	0.0105	0.00690
	(0.0104)	(0.0105)	(0.0104)	(0.0172)	(0.0168)	(0.0172)
L.Urban popuration (% of total)	0.00520	-0.0228	-0.00806	-0.0411	-0.0141	-0.0207
	(0.0291)	(0.0299)	(0.0295)	(0.0420)	(0.0415)	(0.0422)
L.Exports (% of GDP)	-0.0658***		-0.0692***	-0.0151		-0.0104
	(0.0146)		(0.0146)	(0.0198)		(0.0197)
L.Imports (% of GDP)	0.0412**		0.0442***	0.0267		0.0262
	(0.0170)		(0.0170)	(0.0181)		(0.0180)

L.Foreign direct investment		-0.161*	-0.202**		-0.131	-0.145*
		(0.0870)	(0.0856)		(0.0822)	(0.0836)
Constant	-7.383	-6.430	-6.634	-2.293	-1.556	-2.079
	(4.911)	(5.008)	(4.900)	(3.721)	(3.868)	(3.966)
Observations	599	599	599	388	391	384
R-squared	0.731	0.721	0.734	0.596	0.605	0.600

Notes: Standard errors in parentheses. *: $p < 0.10$; **: $p < 0.05$; and ***: $p < 0.01$.

Table 4. Testing the Effect of Exports on Underemployment

	Income groups defined by GDP per capita $ in 2010					
	5000 ≦ Higher income < 25000			Lower income < 5000		
	(1)	(2)	(3)	(4)	(5)	(6)
L.Sector dualism (|emp_agr - gdp_agr|)	0.786***	0.745***	0.730***	0.679***	0.681***	0.670***
	(0.0265)	(0.0247)	(0.0273)	(0.0384)	(0.0394)	(0.0398)
L.GDP per capita logged, constant US$	-0.705	-0.577	-0.674	1.737*	1.594	1.805*
	(0.552)	(0.536)	(0.545)	(0.918)	(0.973)	(0.983)
L.School enrollment_secondary	-0.00295	0.0126	0.0125	-0.0640**	-0.0751**	-0.0687**
	(0.0107)	(0.0109)	(0.0110)	(0.0292)	(0.0308)	(0.0309)
L.Urban population (% of total)	-0.0275	-0.00144	-0.00821	-0.118*	-0.116*	-0.120*
	(0.0329)	(0.0336)	(0.0340)	(0.0690)	(0.0703)	(0.0702)
L.Exports (% of GDP)	0.00347		0.0179	-0.100***		-0.0944**
	(0.0151)		(0.0156)	(0.0385)		(0.0392)
L.Imports (% of GDP)	-0.0230		-0.0216	0.0554*		0.0439
	(0.0162)		(0.0167)	(0.0322)		(0.0345)

L.Foreign direct investement		0.0481	0.0653		0.227	0.205
		(0.0830)	(0.0842)		(0.194)	(0.210)
Constant	10.29**	6.878	8.575*	4.924	5.087	5.131
	(4.738)	(4.676)	(4.862)	(6.531)	(6.812)	(7.030)
Observations	593	570	570	358	358	355
R-squared	0.760	0.751	0.752	0.719	0.712	0.719

Notes: Standard errors in parentheses. *: $p < 0.10$; ** p: < 0.05; and *** p: < 0.01.

Table 5. Estimation of Effects of Exports on Income Inequality

	Income groups defined by GDP per capita $ in 2010								
	All < 25000			5000 ≦ Higher income < 25000			Lower income < 5000		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
L.Gini_net	0.896***	0.903***	0.901***	0.879***	0.881***	0.876***	0.891***	0.902***	0.900***
	(0.0149)	(0.0143)	(0.0146)	(0.0251)	(0.0234)	(0.0245)	(0.0207)	(0.0196)	(0.0203)
L.GDP per capita logged	1.263***	1.180***	1.258***	0.371	0.494	0.469	1.980***	1.915***	2.123***
	(0.319)	(0.324)	(0.330)	(0.366)	(0.365)	(0.362)	(0.531)	(0.601)	(0.616)
L.School enrollment_secondary	-0.00237	0.00362	0.00294	0.00530	0.0113	0.0124	-0.0162	-0.0191	-0.0182
	(0.00855)	(0.00901)	(0.00906)	(0.00866)	(0.00883)	(0.00873)	(0.0153)	(0.0171)	(0.0172)
L.Urban population	-0.0258	-0.0211	-0.0166	-0.0413*	-0.0382	-0.0371	0.0137	0.00910	0.0194
	(0.0215)	(0.0219)	(0.0222)	(0.0234)	(0.0237)	(0.0240)	(0.0401)	(0.0420)	(0.0422)
L.Exports	-0.0232**		-0.0137	-0.0119		-0.00722	-0.0367**		-0.0282*
	(0.00992)		(0.0102)	(0.0127)		(0.0129)	(0.0155)		(0.0158)
L.Imports	0.0115		0.000986	0.0119		0.0122	0.0119		-0.00406
	(0.00991)		(0.0104)	(0.0148)		(0.0162)	(0.0135)		(0.0140)

L.Foreign direct investment		0.0331**	0.0320**		-0.00433	-0.00797		0.0462***	0.0463**
		(0.0129)	(0.0136)		(0.0151)	(0.0157)		(0.0169)	(0.0180)
Constant	-3.476	-3.777	-4.104	1.792	0.337	0.418	-8.438**	-9.145**	-10.16**
	(2.742)	(3.052)	(3.083)	(3.903)	(3.777)	(3.810)	(3.986)	(3.946)	(4.011)
Observations	1823	1770	1756	790	761	755	1033	1009	1001

Notes: Standard errors in parentheses. *: $p < 0.10$; **: $p < 0.05$; and ***: $p < 0.01$.

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