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The Impact of Trade and Labor Market Regulations on Employment and Wages: Evidence from Developing Countries

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on Employment and Wages: Evidence from Developing Countries[*]

by

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Abstract: This paper examines the effects of openness and labor market rigidity on labor market outcomes in the manufacturing sector using panel data from 48 developing countries.   Results from reduced form equations for employment and wages suggest that on average trade liberalization has had a weak impact on employment and wages. At the same time, however, the effects of trade liberalization in any given country are conditional on the nature of labor market regulations: trade liberalization is more likely to have a positive impact on employment and wages in countries with flexible labor markets and vice versa. Additionally, more regulated labor markets tend to have higher average wages but these appear to come at the expense of sector wide employment.

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1. Introduction

Over the last two decades a number of developing countries have moved to liberalize their trade regimes. Proponents of these liberalizations typically argue that one of the chief beneficiaries of greater openness to trade are the workers in these countries. In particular, given abundant supplies of labor trade liberalization encourages producers to reallocate output toward labor-intensive goods. Depending on conditions in labor markets, the resulting increase in the demand for labor translates into some combination of an increase in employment and/or wages.

While the logic of this argument is fairly compelling and is generally supported by the experience of the "early" liberalizers – the Newly Industrialized Economies of East Asia (Hong Kong, Korea, Singapore and Taiwan) – more recent episodes of trade liberalization appear not to have been associated with large improvements in prospects for the typical worker (Robbins, 1996; Wood 1997).

There are various factors that may explain the apparent divergence between the expectations of liberalization advocates and the recent evidence.   For instance, suppose that trade liberalization leads to an inflow of new technologies from abroad. To the extent that new technologies are increasingly skill-biased – as growing evidence suggests is the case – the recent episodes of trade liberalization may lead to an increased demand for workers, but essentially the small minority with relatively high skills (Wood, 1997).

Alternatively, the available evidence may be incomplete in important ways. For example, it is widely acknowledged even among proponents of trade liberalization that the short-run effects of liberalization are likely to be adverse for labor in the aggregate. Reallocation of resources to new firms and industries takes time and it is possible that the available time series are simply not long enough to capture the effects of trade fully. Similarly, the sample of

countries that have been examined may not be the most appropriate. Many of the recent studies which find limited benefits from trade liberalization for the typical worker have focused on the experience of Latin American countries. Evidence from other parts of the developing world may point in a different direction. For example, Suryahadi's (1999) analysis of trends in employment and wages for labor abundant Indonesia leads him to conclude that these are consistent with the patterns one would expect from standard trade theory. Similarly, Kambhampati, Krishna, and Mitra (1997) utilize firm level data from India and find support for the notion that import competing firms may respond to trade liberalization by *increasing* employment in an imperfectly competitive setting.

Still others argue that trade does have the potential to benefit workers at large, but that the nature of labor market regulations plays an important role in realizing this potential (Edwards and Edwards, 1994). Thus where labor market regulations impinge on the ability of employment and wages to adjust to changes in demand and supply conditions, through minimum wage laws or restrictions on worker retrenchment, for example, the potential for trade liberalization to benefit workers is likely to be unrealized.

This paper uses panel data from 48 developing countries to shed some light on these issues focusing, in particular, on the relationship between trade liberalization and labor market regulations and labor market outcomes. More specifically, reduced form equations for manufacturing sector employment and average real wages are estimated to examine how indicators of openness and labor market rigidity are related to labor market outcomes.

The results are interesting and suggestive – though subject to the usual caveats that apply to cross-country analysis of the type used here. They indicate that on average employment and wages are adversely affected in the aftermath of trade liberalization but tend to recover fairly

soon afterwards.   The recovery is more robust for wages which can end up higher than before.

Employment may end up mildly below its original level but the effect is generally not

statistically significant.

As for labor market rigidity, the estimates of this paper indicate that more regulated (and

thus by assumption more rigid) labor markets tend to be associated with higher real wages. But

the higher wages come at the expense of lower employment suggesting that collective bargaining

is organized to defend the wages of those currently employed rather than expanding employment

per se. Interestingly, the results also suggest that trade liberalization is more likely to have a

beneficial impact when labor markets are flexible and vice versa.

The remainder of this paper is organized as follows.   Section 2 describes the channels

through which trade is believed to effect workers, Section 3 describes the data used in this paper,

and Section 4 details the empirical results. Section 5 concludes.

2. Trade and Labor Market Linkages

The most commonly used analytical framework for understanding the links between trade

and labor markets is provided by the Heckscher-Ohlin model of international trade. Under the

assumptions of the standard two country, two factor (capital and labor), and two goods version of

the model the movement from autarky to trade is associated in both countries with an increase in

the relative price of the good which makes intensive use of the relatively abundant factor.

Assuming each country produces both good, the relative price of the more labor intensive of the

two goods will increase in the labor abundant country leading profit seeking firms there to switch

production toward the labor intensive good while the opposite will happen in the capital

abundant country. These changes entail an increase in the demand for labor in the labor

abundant country. In view of the model's assumption of full employment the increase in demand

for labor in turn leads to higher wages; relaxing this assumption should, however, allow the

increase in demand for labor to translate into some combination of increases in employment and

wages with the precise magnitudes depending on conditions in labor markets. [1]

While the H-O model may be built on some rather restrictive assumptions, the basic

insight of the model that trade should benefit a country's abundant factor is quite compelling.

Nevertheless, the actual effects of trade on labor markets are likely to be influenced by real

world features which the model in its standard form abstracts away from. [2] Focusing on labor

market issues consider, for instance, that while the H-O model assumes an inelastic supply of

labor, conditions in some developing countries may be better characterized by an effectively

unlimited supply of workers at prevailing wages in the tradeables sector. Rightward shifts of the

demand for labor in response to trade liberalization would then result in higher employment but

not increased wages.

More critically, realizing the gains from trade requires that factors reallocate from import

competing sectors to exporting sectors. If factors are immobile, however, trade liberalization can

have counter productive effects. While treatments of factor specificity typically tend to focus on

capital as immobile in the short run (which by itself would cause wages to decline in the

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[1] Rodrik (1999) has raised the possibility that trade liberalization may also affect labor
by making the demand for labor more elastic. The empirical basis for this possibility is
weak, however (see Krishna, Mitra, and Chinoy, forthcoming).

[2] For example, trade liberalization may have important implications for technical
efficiency and the set of technologies available for producers in developing countries.
Thus technology could be skill-biased and benefit primarily skilled workers as argued by
Robbins (1996) and Wood (1997). However, trade liberalization may also spur economic
activity, and thus overall employment and wage prospects. While the former possibility
cannot be examined here given the available data (see Section 3 on data issues), there is
some indirect support for the latter possibility (see Section 4 on results).

immediate aftermath of a trade liberalization), even labor is unlikely to be anywhere as mobile as the standard H-O model suggests.

To begin with the process of finding a new job even in a growing sector is not trivial. Job searches take time and workers typically possess firm and sector specific skills which are difficult to replace/obtain. Put another way, job destruction may lead job creation by a significant length of time.

At another level, labor markets in the formal sector of many developing economies operate under government regulations covering job security, minimum wages, collective bargaining, and mandated contributions to social funds. Although intended to protect workers from the vagaries of markets a number of economists believe that these regulations can introduce distortions in the efficient functioning of markets and impede reform induced adjustments.

Legislations which make it difficult for firms to lay off workers, as is the case in large-scale Indian manufacturing, are likely to impinge on firms' ability to reallocate resources to new lines of production; they may also cause firms to hire fewer workers than otherwise and not enter particularly labor intensive product lines in the first place.[3] To the extent that outright disregard for these regulations is not widespread, such regulations are likely to impede adjustment and dilute the benefits of trade reform for workers as a whole.

Similarly, minimum wage legislations are often blamed for encouraging unemployment. This effect can be exacerbated by trade liberalization, especially since minimum wage legislations typically apply to import competing (and capital intensive) sectors. Minimum wage

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[3] See Basu, Fields, and Debgupta 2000; Fallon and Lucas 1993; Datta Chaudhuri 1995, etc. for such views regarding the Indian case.

6

legislations could even lead to lower wages in uncovered sectors even if these are the export oriented labor intensive sectors (Edwards and Edwards, 1994).[4]

Finally, unionization and the nature of collective bargaining is likely to influence not only labor markets themselves, but also how trade liberalization affects labor market outcomes. Thus as Rama (1994) points out trade protection is likely to increase market power and create rents for domestic firms, thereby providing an incentive for workers to unionize and attempt to capture part of these rents in the form of higher wages. A decline in trade protection could then be associated with reduced rents, diminished incentives and abilities to bargain for higher wages on the part of labor, and thus downward pressure on wages. Alternatively, a union may choose to bargain for maintaining its wages at the expense of employment. Either way, collective bargaining can work against the standard H-O type effects whereby trade liberalization would increase wages in labor abundant countries.

It must be pointed out, however, that there is considerable disagreement among analysts on whether the types of labor market interventions discussed above have such negative consequences on labor market outcomes and adjustment (Freeman 1993). For example, while some regulations may not be binding (minimum wages may be set below market clearing rates) others which are may be evaded or avoided without too much effort (Squire and Suthiwart-

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[4] Let trade liberalization lead to a downward shift in the demand for labor in the import competing sector (the capital intensive sector in developing economies), thereby reducing employment in that sector. Since wage rigidity inducing regulations typically apply to this sector, the employment reduction effect will be larger than otherwise. Now although labor intensive export sector will be able to absorb some of the displaced labor, this will only be at the expense of offering initially lower wages to workers. As capital begins to reallocate from the import competing to the export sector wages in the exporting sector will increase. However, whether wages in the export sector and total unemployment will ultimately be higher or lower than the pre-liberalization period cannot be determined a priori. See Edwards and Edwards (1994) for details.

Narueput 1997). Indeed, some analysts go further and argue that labor market interventions can even facilitate adjustments by protecting the well-being of workers (Standing and Tokman, 1991 cited in Freeman, 1993).

The resolution of these debates is essentially an empirical issue. The analysis of cross-country data carried out below may be viewed then as an attempt at asking whether there are some empirical regularities relating to openness to trade, labor market regulations, and labor market outcomes that can shed light on these debates.

3. Empirical Framework and Data Issues

Estimation Strategy

The strategy adopted here to examine the linkages between trade and labor market regulations and labor market outcomes is to estimate reduced form equations for employment and average wages using an unbalanced panel of 48 developing countries. The employment and wage equations take the following form:

$$\log L_{it} = a_i + a_{i1} \ln(T_{it}) + a_{i2} \ln(LR_{it}) + a_{i3} \ln(Z_{it}) + \sum a_t YR_t + \varepsilon_{it}, \quad (1)$$

and

$$\log W_{it} = b_i + b_{i1} \ln(T_{it}) + b_{i2} \ln(LR_{it}) + b_{i3} \ln(Z_{it}) + \sum a_t YR_t + \eta_{it}. \quad (2)$$

Due to data availability employment (L) and wages (W) are not economy-wide and instead pertain to the manufacturing sector for countries, i, and over time, t.[5] T and LR are measures of

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[5] The data also do not distinguish between workers (for example, between skilled/unskilled workers). Thus it is not possible to examine how trade liberalization has effected skilled versus unskilled workers.

openness to trade and labor market regulations, respectively while Z represents a vector of other variables which are likely to effect employment and wages through their impact on demand for and supply of labor. These include real GDP, an index of the real exchange rate vis-à-vis the US dollar, and the size of the labor force.

The estimating equations also include country and time dummies. These are included in order to control for omitted, time-invariant country characteristics and common period specific shocks. Finally, ε_{it} and η_{it} represent error terms which picks up random measurement errors in employment and wages, respectively, and the effects of labor demand and supply shocks on employment and wages which are not picked up by the included independent variables.

Data and Variables

The use of country fixed effects to control for time-invariant country specific unobservables necessitates that the variables used in estimation vary in the within country dimension. Although this creates obvious problems – many commonly used indicators of trade policy and labor market regulations are at best country specific rather than country and year specific – there does exist enough of the relevant type of information to allow us to go ahead with the analysis.

Unfortunately, there are significant gaps in the data. Not only are the years for which data are available different across countries, missing information for even one variable requires that the corresponding observation be dropped from the econometric analysis. The panel data is thus an unbalanced one. [6] For the vast majority of countries (39 out of 48) there are at least 10

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[6] While an unbalanced panel is not really a problem as along as data availability is not systematically related to the values of the relevant variables, it does put practical limitations on the type of econometric procedures that can be implemented. In particular, dealing with endogeneity issues by using potentially lagged variables as

years of valid observations; a few have only 5 years of data. The earliest valid observation is for

1970 while the latest one is 1997.[7]

Employment and Real Average Wages:

Annual data on employment and average wages are obtained from the UNIDO Industrial

Statistics Database.[8] While employment is measured by the number of employees or persons

engaged in total manufacturing (ISIC 300), wage rates are derived by dividing the annual wages

and salaries paid to employees by the total number of employees in manufacturing. The wage

and salary data, expressed originally in current local currency terms, are converted into constant

dollar terms by first deflating them by country specific CPI (base year = 1995) and then

converting the resulting series into constant dollar values by further deflating it by average

nominal exchange rate values for 1995.[9]

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instruments – since external instruments are difficult to find – becomes cumbersome and
is not attempted here.

[7] The appendix provides a list of the sample countries plus the number of years for which
key data are available.

[8]   The sources used by the UNIDO Industrial Statistics Database are: (i) data provided by
national statistical offices through questionnaires; (ii) data added/adjusted by UNIDO based on
national publications; (iii) data added/adjusted by UNIDO based on international publications,
and UNIDO estimates that adjust data to the 3-digit ISIC classification; (iv) UNIDO estimates to
fill gaps in the time series; and (v) UNIDO provisional estimates to bring the time series to a
more current year.

[9] The source for CPI and nominal exchange rates is the Global Development Network
Growth Database, Macro Time Series (World Bank).
<www.worldbank.org/research/growth/GDNdata.htm>

To capture openness this paper uses the two measures of openness which are available for the broad range of developing countries and over the fairly extensive time period used here. The first is based on the share of trade (exports plus imports) in GDP while the second is an average tariff rate computed by dividing total import duties by the volume of imports.

As measures of openness to trade these two variables suffer from some well known problems and it is important to be aware of these. Trade shares in particular are likely to reflect not only the stance of trade policy but other determinants of trade as well. For example, it is widely acknowledged that trade volumes reflect country specific factors such as size and geography. In addition, high trade volumes relative to GDP may also result from high growth if countries with superior economic performance integrate more closely with the world economy. A positive correlation between employment and wage growth and trade shares may then be driven by the positive effects of economic growth on all three variables.

Average tariff rates are a more direct measure of trade policy, but even these are not perfect. Since high tariff rates tend to drive the import of corresponding goods down, average tariff rates will underestimate the extent of trade restrictions. Similarly, a widespread usage of non-tariff barriers can also restrict the usefulness of average tariff rates as a measure of trade barriers. One way out of the latter problem would be to combine information on tariffs with non-tariff barriers. However, time-series data on non-tariff barriers are not available for more than a handful of countries.

At the same time, however, there are some mitigating factors which alleviate some of the problems with the above measures of openness. First, insofar as the trade share variable is concerned the usage of fixed country effects in estimation means that it is the within country

11

variation of trade shares that is relevant. To the extent that trade shares fail to capture trade

policy adequately because of country specific determinants of trade shares, such as country size,

for example, the inadequacy of trade shares as a measure of trade policy is alleviated. Second,

as Rodriguez and Rodrik (2000) point out in their critical review of the empirical literature on

trade policy and growth, average tariff rates seem to serve the purpose of capturing the

restrictiveness of trade regimes reasonably well.

Indeed, it is encouraging to note that although moderate, simple correlations between

tariff rates, average tariff rates, and a time-invariant measure of non-tariff barriers due to Barro

and Lee (1994) are in the "right" direction. Table 1 which details simple correlations of these

three variables indicates that higher average tariff rates are associated with smaller trade shares

as one might expect. In addition, higher average tariff rates are also positively correlated with

quota coverage.

Measures of Labor Market Rigidity:

Obtaining variables which capture the nature of labor market regulations for a large

number of country and over time creates probably the most difficulties in carrying out the type of

empirical exercise that is attempted here. As described earlier, labor market regulations blamed

for creating rigidities typically include legal provisions regarding minimum wages, job security,

collective bargaining, and mandated benefits. While in principle it is possible to obtain

information on these regulations over time and across countries and code them appropriately for

empirical analysis, in practice this is a very difficult task. Rama and Artecona (2000) represent

possibly the only comprehensive effort at doing so; however, their work - some of which is used

here - is still underway.

There is, however, one variable which does relate to labor market regulations and is easily available across countries and over time. This is the number of International Labor Organization (ILO) Conventions ratified and in force by a country at any given point in time.[10] These Conventions relate to the terms and conditions of employment and cover a range of issues, including the right to collective bargaining, child labor, discrimination in employment, safety of working conditions, etc. Once a country ratifies a particular Convention, it commits to make it legally binding. In this way, the number of Conventions ratified by a country may be taken as an indictor of the extent to which labor markets are regulated.[11] From the standard neoclassical perspective, then, a country with more (less) ratifications may be considered as having more rigid (flexible) labor markets.

As a measure of labor market rigidity the number of ILO Conventions ratified by a country certainly suffers from a number of deficiencies. First, not all Conventions may be equally relevant to the issue of labor market flexibility/rigidity. Second, even if a Convention is ratified its enforcement may be suspect. This is especially possible since the ILO does not have power of enforcement and relies instead on persuasion and voluntary compliance. Similarly, non-ratification does not mean that the country in question does not comply with the spirit of a

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[10] Founded in 1919, the ILO is the main international body which is concerned with the implementation and monitoring of labor standards. Through a tripartite organizational structure, composed of representatives of labor, business and governments, the ILO has prepared and promoted over 180 Conventions covering the conditions and terms under which labor is employed.

[11] Countries sometimes also denounce a previously ratified Convention. This is taken into account in obtaining the number of Conventions in force at any given time.

Convention. For example, as Rodrik (1996; page 16) points out "Few would believe that workers are less likely to be exposed to asbestos in the workplace in Cameroon – which has ratified the 1986 Asbestos Convention – than they are in the United States – which has not".

This paper attempts to alleviate these problems in two ways. First, it checks the importance of enforcement issues by adjusting the number of ILO Conventions ratified by interacting them with an indicator of civil liberties and political rights due to Helliwell (1994) and used by Rodrik (1996).[12] Countries which safeguard their citizens' civil liberties and political rights are more likely to enforce labor standards which have been written into law. Thus while two countries may have ratified the same number of ILO Conventions, the one with a higher score on the civil liberties and political rights indicator (which ranges from a low of 0 to a maximum of 1) has more enforcement to its Conventions.

Second, it uses an alternative indicator of labor market rigidity created and utilized by Forteza and Rama (2001). This measure uses information on minimum wages, mandated benefits, trade unions and government employment to construct a variable which ranges from 0 (maximum flexibility) to 1 (maximum rigidity).[13] It should be noted that because this indicator is country specific rather than country *and* period specific, it can not be used as a separate

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[12] The indicators of civil liberties and political rights are from Freedom House and range from 1 (maximum rights) to 7 (minimum rights). There are then combined into a composite indicator by making the transformation: (14-(Civil Liberties + Political Rights))/14. See Rodrik (1996) for details.

[13] The Forteza and Rama labor market rigidity indicator is computed by averaging individual indicators for minimum wages, mandated benefits, trade union, and government employment range, each of which range from 0 to 1. While minimum wages and trade unions can reduce labor market flexibility in limiting the adjustment in wages and/or employment, mandated benefits can raise the costs of workers for employers if workers do not pay for them. Similarly, a large share of government employment can proxy for a rigid labor market since government employees enjoy various benefits including job security and which tend to be demanded by employees in the private sector.

independent variable in the estimating equations for employment and wages. Instead, it can be used only in interaction with a variable which varies over time.

Correlations between the ILO Conventions ratified, with and without adjustment for the protection of civil liberalities and political rights, and the labor market rigidity indicator of Forteza and Rama are described in Table 2. Not surprisingly, the two ILO Conventions variables are fairly closely correlated. Although not as high, the correlation between Forteza and Rama's rigidity indicator and the unadjusted ILO Conventions variables are moderate.

<u>Other Variables:</u>

Because overall economic activity is bound to have an important effect on labor demand in manufacturing and, therefore, employment and wages, it is important to include a measure of GDP in equations 1 and 2. This is done by using the data on GDP (constant 1995 US dollars) available from the World Development Indicators 1999. Similarly, it is important to control for the size of the overall pool of labor available to manufacturing sector. While the population between ages 15 and 65 would be a preferred measure, this paper uses the more readily available labor force size as a proxy. Finally, we also include among the list of independent variables an index capturing each country's real exchange rate vis-à-vis the United States.[14] If trade liberalization is accompanied a liberalization of the capital account, associated inflows of capital may raise real exchange rates which would, in turn, tend to offset the effects of the trade liberalization on the relative profitability of import competing and export sectors. Alternatively,

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[14] The index is computed as CPI(local)/(CPI(US)*Official Exchange Rate, where the official exchange rate is defined as the number of local currency units per US$ (average over the year). An increase in this index implies a real appreciation. The data is in index form (1995=100) and has been obtained from the Global Development Network Growth Database of the World Bank.

if a trade liberalization is accompanied by a real depreciation the effects of trade liberalization would tend to be reinforced. Either way including the index of real exchange rate movements will help disentangle the effects of trade liberalization from those involving exchange rates.

It is important to note one important limitation of the data, especially that relating to employment and wages. In many developing countries a large proportion of workers in the manufacturing sector are employed in the so-called informal or unregistered sector and are not captured adequately in industrial statistics. If production in the informal sector is the more labor-intensive one, an expansion of the unorganized sector at the expense of the more capital intensive organized sector as a result of trade liberalization will go unrecorded in our data. [15] Trade liberalization could then be associated with a decline in employment as it is measured here even if in reality total employment in the manufacturing sector increased. The fact that the results of this paper essentially pertain to formal or organized/registered manufacturing should, therefore, be kept in mind in interpreting the results.

4. Empirical Findings

Descriptive Statistics

Table 3 presents some statistics on measures of trade orientation and labor market rigidity by region. The numbers are simple averages over countries in the five regions which account for

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[15] In India in 1993-94, for example, organized/registered manufacturing (i.e., all factories employing 10 or more workers using power, and 20 or workers without power) accounted for about 2/3rds of measured manufacturing value added but employed only about 1/5 of manufacturing sector workers. Therefore, a large majority of the workforce in manufacturing is in the unregistered (unorganized) sector, which also accounts for much of India's net merchandise exports (Nagaraj 2000).

a significant number of the sample LDCs for the year 1985 (or closest available year).[16]
According to both administrative (tariff and quota coverage rates) and trade volume measures,
East Asia has the most open economies among developing regions. That is, not only do its
average tariff and quota coverage rates tend to be the lowest, its trade flows relative to GDP tend
to be the highest. In contrast, South Asia appears fairly closed. With the exception of quota
coverage, which tend to be higher in the Middle East and North Africa (MENA) and Sub-
Saharan Africa (SSA), tariff rates and trade shares in South Asia are the highest and lowest,
respectively. As for Latin American countries, on average they have trade shares that are fairly
similar to those of the MENA and SSA country average; but their trade regimes can be
considered fairly open by developing country standards when one focuses on tariff rates and
quota coverage ratios.

East Asia also tends to have the most flexible labor markets as the comparison of the
number of ILO Conventions ratified (with and without adjustment for enforcement) and the labor
market rigidity indicator of Forteza and Rama reveals. In contrast, Latin America tends to have
the most rigid labor markets in terms of all three indicators. The other three regions all fall
within these two extreme, though the individual rankings do differ across the three measures.

How are the various measures of openness and labor market flexibility correlated with
employment and wages? Figures 1 to 4 plot the average annual growth in employment and real
wages against various indicators of openness and labor market rigidity. Because of the cross-
sectional nature of the comparisons, we try to use the longest common period over which growth

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[16] Only 4 of our sample countries are excluded from this table. These are Hungary and
Turkey from Europe and Fiji and Papua New Guinea from the Pacific. Information for
all sample countries, including the four omitted in Table 3, are presented in the
Appendix.

rates can be computed. While this is 1970 to 1990 for many countries, we do also include countries for which the data begins after 1970, making the appropriate adjustment in the calculation of average annual growth rates.

Although employment growth is positively correlated with greater openness (as the respective trend lines for average tariff rates and trade shares in Figures 1a and 1b indicate), the relationship is weak and statistically insignificant.[17] On the other hand real wage growth and greater openness do have a stronger relationship (Figures 2a and 2b).

Interestingly, a stronger relationship seems to be present between the labor market outcomes and labor market rigidity. In all cases, greater labor market flexibility is associated with higher employment and real wage growth and the association is significant at least at the 10 percent level. In addition, the two labor market rigidity measures used here (ILO Conventions and Forteza and Rama's indicator) typically 'explain' a much higher percentage of the variation in cross-country growth rates in employment and wages that do the openness measures.

Taken together the scatter plots are consistent with openness raising real wages in labor abundant developing countries but leaving employment essentially unchanged. They are also consistent with the notion that labor market regulations aimed at protecting workers may induce distortions which paradoxically lead to lower employment and real wage growth. Of course, the scatter plots suffer from obvious defects. They are simply bi-variate associations and take no account of the influence of other factors on employment and real wages. As such they are

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[17] Although visually the graphs suggest that the positive relationship between employment growth and trade share is driven by an outlier (Singapore), this is not the case. In fact, removing the outlier makes the trend line more positively sloped (though the trend is still statistically insignificant). Steeper trend lines also result when this outlier is removed in the wage growth versus trade share scatter plots.

especially lacking in any causal interpretation to the relationships. To alleviate this problem we now turn to the estimates of the reduced form equations for employment and wages.

Employment and Real Wage Elasticities

Tables 4-7 present results from estimation of reduced form equations for employment and real wages.[18] Openness is measured in terms of average tariff rates and the share of total trade in GDP. Both measures are introduced contemporaneously as well as with a one year lag to take account of adjustment lags between changes in trade policy and its effects on labor markets. It is worth noting once again that in addition to year dummies, each of the regressions are estimated using country dummies. Thus the resulting estimates are free of any omitted variable bias on account of country specific factors, including among other things geography, and are based on variation in the within-country dimension.[19] Of course, they would be still susceptible to endogeneity if time-variant omitted factors drive employment and wages and are also correlated with openness.

Consider first the estimates described in Tables 4a and 4b. In general, the estimates indicate that openness has a positive, albeit statistically weak impact on employment, a positive and stronger impact on real wages, and that these positive impacts take time to develop. Indeed, not only do the elasticities of the two openness measures have larger absolute values when they are introduced with one period lags, the equations which include both the current and lagged

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[18] Forty-eight LDCs for which at least five years of data are available over the 1970-1997 period are included in estimation.

[19] Thus this is somewhat different from the relationships described by the scatter plots which relate changes in employment and wages in the within dimension (i.e., as growth rates of employment and wages) to the cross sectional variation in measures of openness and labor market flexibility.

value of openness reveal that it is the lagged value of the openness variables which drives their positive impact.

In terms of magnitudes, the impact of reductions in average tariff rates and increases in trade shares are larger (and the effects estimated more precisely) for real wages than for employment. For example, while a one percent decline in lagged average tariff rates raises employment by 0.03 percent (an effect which just fails to be statistically significant at the 10 percent level), it raises real wages by 0.06 percent. The corresponding elasticities for trade share are 0.15 and 0.35 percent for employment and real wages respectively (with both statistically significant at the 10 percent level or lower).

The estimates also indicate that labor market rigidity, as measured by the number of ILO Conventions ratified, restricts employment but raises real wages.[20,21] This pattern is consistent with a scenario where labor market interventions serve to raise the bargaining power of workers which is used in turn by workers to defend wages even if at the expense of employment rather than the other way around.[22]

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[20] Estimation is carried out using ln(1+ILO) in order to deal with observations for which the number of ILO Conventions is equal to zero.

[21] Results are similar when the ILO Conventions are adjusted for enforcement using the democracy variable as in Rodrik (1996) and are thus not reported.

[22] It may be noted that while the negative employment elasticity of the ILO Conventions is consistent with the evidence from the scatter plots (and the notion that labor market regulations may restrict employment growth), the positive elasticity of these on real wages is not and suggests that although on average economies with faster wage growth intervened less in the operation of labor markets (thereby explaining the negative trends in the real wage growth versus labor market indicators scatter plots), the faster wage growth was the result of other country specific factors and not the lack of labor market interventions themselves.

The estimates of Tables 4a and 4b also reveal that an appreciation of the real exchange rate has a negative and significant impact on employment and a negative, but generally insignificant impact on wages. Finally, the estimates also indicate that an expansion of the labor force is associated with an increase in employment but a decrease in real wages.   This is fairly reasonable and is consistent with the effects that shifts in the supply curve of labor would have on equilibrium employment and wages.

While the estimates of Tables 4a and 4b lend support to the notion that the prospects for workers in labor intensive countries improves with trade, it is important to note that the estimated elasticities on the openness measures are based on regressions which omit any measure for general economic activity.   To the extent that openness and economic activity are positively correlated, the exclusion of measures of economic activity from the regression equations implies that the coefficient on openness may be capturing not only the resource reallocation effects of openness, but also the impact that general economic activity has on labor markets. Other than the extreme case where changes in economic activity are driven completely by changes in openness, the omission of economic activity will lead to biased estimates of the openness variable.

Introducing real GDP among the list of explanatory variables in the employment and wage equations, as is done in the regression equations reported in Tables 5a and 5b, gives us a way of assessing the impact of openness after controlling for state of economic activity.   As the estimated elasticity on real GDP indicates across the various columns of Table 5a and 5b, a one percent rise in GDP leads to a 0.70-0.73 percent rise in employment and a 0.87-0.96 percent rise in real wages.   This positive impact appears to come, however, essentially at the expense of the

positive impact of the openness indicators, especially in the employment equations. For example, while the ILO Conventions, labor force size, and the real exchange rate all continue to influence employment and wages in much the same way as they do in Tables 4a and 4b, virtually all elasticities on average tariffs and trade shares now indicate that greater openness leads to a *reduction* in employment. However, the negative effects lose their significance when the lagged measures of openness are considered indicating that as in Tables 4a and 4b the immediate impact effect of trade liberalization is likely to be negative and is moderated over time and may even lead to higher employment ultimately. A lagged positive impact of trade liberalization is especially evident in the real wage equations where although the elasticities of average tariff rates (current and lagged) remain statistically insignificant across all specifications, an increase in trade shares offsets by the second period the initial negative impact on real wages.[23]

In summary, the effects of openness on manufacturing employment and wages display some sensitivity to the measure of openness used and the inclusion of GDP as an additional explanatory variable in the estimated relationships. Using trade shares to measure openness and excluding GDP from the RHS of the estimating equations yields positive and statistically significant effects of openness on employment and wages as standard models of trade would predict for labor-intensive countries. Switching to average tariff rates – a measure of openness which is less prone to endogeneity biases – and including GDP as a regressor – especially appropriate if GDP growth induces greater international integration – leads to a dampening of these positive effects: trade liberalization fails to impact real wages significantly while it does lead to some reduction in employment, much of which takes place in the first period of liberalization itself.

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[23] An F-test rejects the null that the sum of the coefficients on current and lagged trade

Interestingly, this is similar to the pattern found by studies of trade liberalization in individual countries. Rama (1994), for example, finds that a 10 percent drop in nominal protection rates in Uruguay led to a decline of 3.8 percentage points in employment. Real wages increased slightly but the effect was not statistically significant.

At the same time the estimates also reveal that labor market rigidities, as measured by the number of ILO Conventions ratified by a country, have an adverse impact on employment but they do raise wages. While this is consistent with labor market regulations raising the bargaining power of manufacturing sector workers and the usage of this bargaining power by these workers to defend their wages, even if at the expense of an expansion of employment, it also suggests that the effects of trade liberalization on labor markets may vary with the nature of labor markets. The latter possibility is investigated next.

Trade and Labor Market Interactions

The relationships estimated so far introduce measures for openness and labor market independently of one another. While the estimated elasticities shed light on the manner in which openness and labor market conditions influence employment and wages, an important question for policy is whether the flexibility or rigidity of labor markets modifies the effects of trade liberalization on labor market outcomes. The estimates described in Tables 6 and 7 introduce interaction terms between openness and ILO Convention and Forteza and Rama's rigidity measures alternatively and allow us to examine this issue.[24] Since the relevant elasticities now

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are zero with P-value equal to 0.05.
[24] Because Forteza and Rama's measure varies across countries but not time it cannot be included as an independent regressor in the fixed effects employment and wage equations.

become dependent on the individual data on openness and labor market rigidity, Tables 6 and 7 also provides elasticities evaluated at the means of the relevant variables and the P-value associated with these.

A comparison between these elasticities and those in Tables 4a-5b indicates a generally similar qualitative impact of openness and labor market rigidity. For example, an increase in labor market rigidity as measured by a rise in the ILO Conventions restricts employment but raise real wages. The impact of openness is also similar to that before although the effects are weaker.[25] The more interesting feature of the estimates of Tables 6 and 7 are in terms of the direct and interaction terms between openness and the labor market rigidity indicators.

Consider first the estimates for the employment equations which do not include GDP as an explanatory variable (first four data columns of Table 6). The own coefficient on the openness variables are as before: the average tariff rates term is signed negatively while the trade share is signed positively. However, the interaction terms involving the ILO conventions and the rigidity measures are positively signed for the average tariff rates and negatively signed for the trade shares and in all cases statistically significant. In other words, the effect of openness on employment in any particular country varies with the extent of flexibility/rigidity of that country's labor markets.

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[25] For example, even in the equations where GDP is not included on the RHS – i.e., a procedure which results in the largest positive impact of openness on employment and wages as noted above – the effects of openness are statistically significant only when openness is measured by trade shares and then only in the wage equation. Including GDP as an additional regressor in the employment and wage equation tends to reverse even some of this limited positive effect. Thus lower average tariff rates or an increase in trade shares is associated with a decrease in employment which is often statistically significant. Trade shares continue to have a positive impact on real wages, but the effect is not always statistically significant (see Table 7 for details).

In particular, the estimates indicate that a one percent decline in average tariff rates in a country with zero ratifications of the ILO Conventions (the case in Korea until 1991) is associated with a 0.28 percent increase in employment. In contrast, a one percent decline in average tariff rates in a country with 76 ILO Convention ratifications (the case in Uruguay from 1995 to 1997) leads to a 0.08 percent *decrease* in employment. The pattern of results are less dramatic when openness measures are interacted with Forteza and Rama's rigidity measure; however, the qualitative patterns are similar. Thus, a one percent reduction in average tariff rates leads to a 0.09 increase in employment for a rigidity index value of 0.11 (the case for Jordan) and a 0.13 decrease in employment for a rigidity index value of 0.57 (the case for Hungary).

Results are weaker when GDP is included as an explanatory variable in the employment equations (final four data columns of Table 6). In particular, the direct and interaction terms involving average tariff rates are all statistically insignificant. However the qualitative patterns are similar: the sign of the interaction term involving openness and labor market rigidity (positive in the case of average tariff rates and negative in the case of trade shares) indicates that greater labor market rigidity either tends to negate the positive impact of liberalization (the case for trade shares or when average tariff rates are interacted with ILO Conventions) or exacerbates its adverse effects on employment (the case when tariff rates are interacted with the Forteza and Rama rigidity indicator).

Turning to the nature of the relationship between openness and labor market rigidity, the direct and interaction terms for average tariff rates indicates that a lowering of tariff rates tends to raise wages but only in relatively flexible labor markets. For example, a one percent reduction in average tariff rates would raise wages by 0.52 percent (0.24 percent) in a country with zero ILO Conventions (0.11 value for the Forteza and Rama rigidity indicator) while it would *reduce*

wages by 0.13 percent (0.39 percent) in a country with 76 ILO Conventions (0.57 value for the Forteza and Rama rigidity indicator).[26]

This is consistent with the notion that labor market rigidities can lead to lower rather than higher wages after trade liberalization (as in the model of Edwards and Edwards, 1994). However, it is in conflict with the pattern of results derived from using trade shares as a measure of openness. For the latter, a one percent increase in trade shares leads to a 0.59 percent decline in a country with zero ILO Conventions while it would increase wages by 0.51 percent in a country with 76 ILO Conventions. The pattern repeats itself when real GDP is included as an additional regressor and when Forteza and Rama labor market rigidity indicator is used instead of the ILO Conventions.[27]

The inconsistency across the two measures of openness is a little disturbing. However, as mentioned before trade shares are more susceptible to be influenced by factors other than just trade policy. Thus suppose that trade policy remains unchanged but that an improvement in economic conditions leads to a rise in trade shares, among other things. It is not difficult to imagine that labor would be able to derive a larger portion of the benefits from the general improvement in economic activity in regimes which give labor greater power. Put differently, if average tariff rates track changes in trade policy more accurately these will be less prone to display relationships which are spurious.

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[26] This is based on the wage equations without GDP included on the RHS. Results are qualitatively similar when GDP is included on the RHS.
[27] The difference is not on account of the different number of observations across the equations which use average tariff rates and trade shares.

5. Concluding Remarks

This paper has used panel data from 48 developing countries to examine the impact of openness and labor market rigidities on employment and wages in the manufacturing sector. The analysis, which is carried out by estimating reduced form employment and wage equations using country and period fixed effects among other controls, highlights some interesting features of the relationship between openness and labor markets.

First, estimates which control explicitly for economic activity suggest that an increase in openness leads to a mild reduction in manufacturing sector employment, especially in the early stages of liberalization, while leaving average wages essentially unchanged. Unless greater openness plays an important role in promoting growth and influencing labor markets through this channel – a phenomena which gets some, albeit limited support in this paper – it appears that the labor market effects of trade liberalization are small.

However, the results also suggest that the impact of trade liberalization on labor markets depends on the nature of labor markets in liberalizing countries. In particular, the estimates obtained using the preferred measure of openness, average tariff rates, suggest that trade liberalization is more likely to have beneficial effects on employment and wages for workers in countries with relatively flexible labor markets. Conversely, trade liberalization in countries with large rigidities in their labor markets may end up exacerbating conditions for workers.

Finally, tighter regulation of labor markets appears to boost wages but seems to do so at the expense of employment. This finding supports the standard neoclassical claims concerning the distorting effects of labor market regulations and suggests that labor market interventions intended to benefit workers be carefully designed if they are to benefit the broad group of workers as opposed to only certain sub-groups at the expense of others.

Taken together, these findings suggest that popular discourses on the effects of globalization exaggerate (in both directions) the aggregate effects of trade liberalization on workers. Nevertheless, the initial impact of trade liberalization is likely to be adverse, as the comparison of elasticities on current and lagged indicators for openness used in this paper reveal. Moreover, even a mild downturn in employment in the aggregate may mask significant churning of jobs and at least for those who lose or are in danger of losing their jobs the costs of liberalization will be large. In this context, the ineffectiveness of prevalent labor market interventions in improving labor market outcomes for workers as a whole is disheartening and suggests that introducing genuinely effective ways of protecting the welfare of workers remains a key challenge for policy.

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Table 1: Correlation Matrix for Measures of Openness

	Average Tariff Rates (%)	Own-Weighted Quota Coverage* (%)	(X+M)/GDP (%)
Average Tariff Rates %	1 --	0.38 (0.01) 42	-0.37 (0.01) 48
Own-Weighted Quota Coverage (%)		1 --	-0.28 (0.07) 42
(X+M)/ GDP (%)			1 --

Notes: Own-weighted quota coverage is from Barro and Lee (1994). Data for average tariff rates and trade shares is for 1985 or closest year. Number in parenthesis is the P-value of the corresponding correlation coefficient. Number of observations used in computing the correlation coefficient is below the P-value.

Table 2: Correlation Matrix for Measures of Labor Market Rigidity

	ILO Conventions	ILO Conventions x Democracy	Labor Market Rigidity Index*
ILO Conventions	1 --	0.76 (<.0001) 48	0.59 (<.0001) 39
ILO Conventions x Democracy		1 --	0.50 (0.0012) 39
Labor Market Rigidity Index*			1 --

Notes: Democracy variable is due to Helliwell (1994) and is as reported in Rodrik (1996). Labor Market Rigidity Index is from Forteza and Rama (2001). Data for ILO Conventions is for 1985. Number in parenthesis is the P-value of the corresponding correlation coefficient. Number of observations used in computing the correlation coefficient is below the P-value.

Table 3: Openness and Labor Market Rigidity Measures Across Regions

Region	Number of Countries	Average Tariff Rates (%)	Own-Weighted Quota Coverage (%)	(X+M)/GDP (%)	ILO Conventions	ILO * Democracy	Labor Market Rigidity Index
East Asia	6	8.41	12.88	107.92	11.83	6.42	0.20
Latin America & Caribbean	18	12.52	23.21	56.71	43.72	31.07	0.33
Middle East & North Africa	5	19.07	41.28	57.22	33.60	10.37	0.28
South Asia	5	21.95	31.70	32.59	23.80	13.39	0.27
Sub-Saharan Africa	10	17.23	32.68	59.22	25.50	7.96	0.22

Notes: Source of various variables is as defined in Tables 1 and 2. Appendix contains a list of all sample countries.

Table 4a: Employment

	ln(Avg. Tariff Rates)			ln(X+M)/GDP		
Openness	-0.01	-	0.01	0.05	-	-0.16
	(-0.56)	-	(0.42)	(0.84)	-	(-2.05)
Lagged Openness	-	-0.03	-0.04	-	0.15	0.25
	-	(-1.48)	(-1.47)	-	(3.11)	(3.66)
ln(1+ILO)	-0.14	-0.14	-0.14	-0.14	-0.12	-0.13
	(-2.72)	(-2.67)	(-2.69)	(-2.63)	(-2.38)	(-2.49)
ln(Lab Force)	0.85	0.73	0.73	0.83	0.83	0.80
	(5.36)	(4.36)	(4.33)	(5.19)	(5.16)	(5.01)
ln(RER)	-0.22	-0.22	-0.22	-0.20	-0.16	-0.20
	(-5.91)	(-5.68)	(-5.68)	(-4.36)	(-3.91)	(-4.42)
R-Square	0.99	0.99	0.99	0.99	0.99	0.99
Observations	720	677	677	714	713	712

Notes: Dependent variable is ln(Employment). T-statistics are in parenthesis. All regressions include country and year dummies.

Table 4b: Real Wages

	ln(Avg. Tariff Rates)			ln(X+M)/GDP		
Openness	-0.04	-	-0.01	0.21	-	-0.16
	(-1.53)	-	(-0.23)	(3.34)	-	(-1.84)
Lagged Openness	-	-0.06	-0.06	-	0.35	0.46
	-	(-2.40)	(-1.89)	-	(6.47)	(5.94)
ln(1+ILO)	0.15	0.15	0.15	0.18	0.20	0.20
	(2.48)	(2.49)	(2.50)	(3.01)	(3.34)	(3.42)
ln(Lab Force)	-0.82	-0.95	-0.95	-0.82	-0.82	-0.85
	(-4.40)	(-4.93)	(-4.90)	(-4.38)	(-4.45)	(-4.62)
ln(RER)	-0.10	-0.06	-0.06	-0.01	0.04	0.00
	(-2.21)	(-1.33)	(-1.28)	(-0.10)	(0.81)	(-0.08)
R-Square	0.96	0.96	0.96	0.96	0.96	0.96
Observations	720	677	677	714	713	712

Notes: Dependent variable is ln(Real Wages). T-statistics are in parenthesis. All regressions include country and year dummies.

Table 5a: Employment

	ln(Avg. Tariff Rates)			ln (X+M)/GDP		
Openness	0.04	-	0.03	-0.08	-	-0.14
	(1.86)	-	(1.24)	(-1.69)	-	(-2.00)
Lagged Openness	-	0.03	0.01	-	-0.01	0.07
	-	(1.39)	(0.54)	-	(-0.26)	(1.12)
Ln(1+ILO)	-0.17	-0.17	-0.18	-0.18	-0.17	-0.18
	(-3.84)	(-3.79)	(-3.87)	(-4.00)	(-3.67)	(-3.92)
Ln(Lab Force)	0.59	0.56	0.54	0.59	0.59	0.57
	(4.21)	(3.75)	(3.67)	(4.13)	(4.15)	(4.02)
Ln(RER)	-0.20	-0.19	-0.19	-0.23	-0.19	-0.23
	(-5.99)	(-5.53)	(-5.65)	(-5.55)	(-5.19)	(-5.55)
Ln(GDP)	0.71	0.72	0.73	0.73	0.70	0.71
	(13.91)	(13.34)	(13.40)	(13.92)	(13.14)	(13.23)
R-Square	0.99	0.99	0.99	0.99	0.99	0.99
Observations	720	677	677	714	713	712

Notes: Dependent variable is ln(Employment). T-statistics are in parenthesis. All regressions include country and year dummies.

Table 5b: Real Wages

	ln(Avg. Tariff Rates)			ln (X+M)/GDP		
Openness	0.03	-	0.02	0.05	-	-0.13
	(1.14)	-	(0.64)	(0.92)	-	(-1.77)
Lagged Openness	-	0.02	0.01	-	0.15	0.24
	-	(0.89)	(0.42)	-	(3.12)	(3.51)
Ln(1+ILO)	0.11	0.10	0.10	0.12	0.14	0.14
	(2.07)	(2.07)	(2.01)	(2.40)	(2.75)	(2.70)
Ln(Lab Force)	-1.17	-1.18	-1.19	-1.13	-1.11	-1.13
	(-7.37)	(-7.34)	(-7.36)	(-7.06)	(-6.94)	(-7.04)
Ln(RER)	-0.07	-0.02	-0.02	-0.04	0.00	-0.03
	(-1.76)	(-0.47)	(-0.55)	(-0.76)	(0.05)	(-0.70)
Ln(GDP)	0.94	0.96	0.96	0.91	0.88	0.87
	(16.38)	(16.25)	(16.25)	(15.51)	(14.78)	(14.46)
R-Square	0.97	0.97	0.97	0.97	0.97	0.97
Observations	720	677	677	714	713	712

Notes: Dependent variable is ln(Real Wages). T-statistics are in parenthesis. All regressions include country and year dummies.

Table 6: Employment

	ln(Avg. Tariff Rates)		ln(X+M)/GDP		ln(Avg. Tariff Rates)		ln(X+M)/GDP	
Openness	-0.28	-0.15	1.09	0.48	-0.01	0.02	0.77	0.11
	(-3.33)	(-2.50)	(5.67)	(3.61)	(-0.17)	(0.34)	(4.54)	(0.93)
ln(1+ILO)	-0.32	-	1.21	-	-0.21	-	0.92	-
	(-4.28)	-	(4.97)	-	(-3.06)	-	(4.26)	-
Openness*ln(1+ILO)	0.08	-	-0.33	-	0.02	-	-0.27	-
	(3.29)	-	(-5.66)	-	(0.66)	-	(-5.23)	-
Openness*Rigidity	-	0.49	-	-1.81	-	0.03	-	-0.73
	-	(2.36)	-	(-3.75)	-	(0.16)	-	(-1.74)
ln(Lab Force)	0.85	1.05	0.76	1.04	0.59	0.87	0.53	0.87
	(5.36)	(6.11)	(4.84)	(6.06)	(4.22)	(5.85)	(3.83)	(5.85)
ln(RER)	-0.24	-0.22	-0.26	-0.22	-0.20	-0.20	-0.28	-0.23
	(-6.33)	(-5.62)	(-5.65)	(-4.49)	(-6.02)	(-5.74)	(-6.70)	(-5.45)
ln(GDP)	-	-	-	-	0.70	0.75	0.70	0.76
	-	-	-	-	(13.41)	(14.06)	(13.70)	(13.91)
Mean Trade Elasticity	-0.007	-0.012	0.005	-0.014	0.037	0.026	-0.110	-0.091
P-value for Trade Elasticity	0.75	0.59	0.92	0.81	0.06	0.19	0.02	0.07
Mean ILO Elasticity	-0.122	-	-0.113	-	-0.170	-	-0.162	-
P-value for ILO Elasticity	0.02	-	0.03	-	0.00	-	0.00	-
R-Square	0.99	0.98	0.99	0.98	0.99	0.99	0.99	0.99
Observations	720	624	714	618	720	624	714	618

Notes: Dependent variable is ln(Employment). Rigidity is the Forteza and Rama indicator of labor market rigidity. T-statistics are in parenthesis. All regressions include country and year dummies.

Table 7: Real Wages

	ln(Avg. Tariff Rates)	ln(X+M)/GDP		ln(Avg. Tariff Rates)		ln(X+M)/GDP	
Openness	-0.52	-0.39	-0.59	0.20	-0.16	-0.17	-1.01	-0.31
	(-5.19)	(-5.61)	(-2.60)	(1.23)	(-1.86)	(-2.96)	(-5.29)	(-2.29)
ln(1+ILO)	-0.17	-	-0.85	-	-0.02	-	-1.24	-
	(-1.97)	-	(-2.96)	-	(-0.27)	-	(-5.14)	-
Openness*ln(1+ILO)	0.15	-	0.25	-	0.06	-	0.33	-
	(4.95)	-	(3.68)	-	(2.23)	-	(5.77)	-
Openness*Rigidity	-	1.36	-	0.09	-	0.77	-	1.56
	-	(5.61)	-	(0.16)	-	(3.77)	-	(3.24)
ln(Lab Force)	-0.84	-1.01	-0.76	-0.95	-1.16	-1.24	-1.07	-1.19
	(-4.55)	(-4.98)	(-4.11)	(-4.61)	(-7.36)	(-7.43)	(-6.81)	(-7.02)
ln(RER)	-0.13	-0.15	0.04	-0.02	-0.08	-0.11	0.03	-0.03
	(-2.87)	(-3.12)	(0.75)	(-0.27)	(-2.06)	(-2.86)	(0.56)	(-0.61)
ln(GDP)	-	-	-	-	0.91	0.98	0.94	1.04
	-	-	-	-	(15.53)	(16.20)	(16.34)	(16.60)
Mean Trade Elasticity	-0.03	-0.012	0.24	0.224	0.027	0.038	0.086	0.119
P-value for Trade Elasticity	0.24	0.67	0.00	0.00	0.22	0.09	0.11	0.04
Mean ILO Elasticity	0.18	-	0.16	-	0.119	-	0.098	-
P-value for ILO Elasticity	0.00	-	0.01	-	0.02	-	0.05	-
R-Square	0.96	0.96	0.96	0.95	0.97	0.97	0.97	0.97
Observations	720	624	714	618	720	624	714	618

Notes: Dependent variable is ln(Real Wages). Rigidity is the Forteza and Rama indicator of labor market rigidity.
T-statistics are in parenthesis. All regressions include country and year dummies.

Appendix Table: Sample Countries and Selected Basic Statistics

Country	No. of Obs.	First Year	Last Year	GDP* (Const. 1995 US Dollars)	Total Labor Force* (100,000s)	Manufacturing Employment* (100,000s)	Mfg. Wages* (Const. 1995 US Dollars)	Average Tariff Rates* (%)	Trade/ GDP* (%)	ILO Conventions Ratified*	Forteza & Rama Rigidity Index	RER*
Argentina	11	1981	1993	2,279.26	117.16	10.73	15,579	14.75	15.45	62.00	0.38	53.67
Bangladesh	16	1974	1989	213.88	426.11	4.58	708	14.77	16.66	30.38	0.33	134.89
Barbados	18	1972	1989	14.77	1.12	0.09	8,740	10.00	122.95	33.00 .		90.81
Bolivia	13	1985	1997	58.18	26.90	0.37	2,394	7.49	46.87	40.00	0.29	106.35
Brazil	5	1985	1994	6,142.09	662.13	40.80	8,873	8.28	18.41	62.40	0.28	82.2
Cameroon	12	1975	1995	68.97	38.76	0.52	5,787	22.08	51.01	38.83 .		118.77
Chile	13	1975	1987	253.52	39.54	2.01	6,267	11.77	48.53	39.08	0.15	120.55
Colombia	24	1971	1994	496.95	108.58	4.76	3,692	14.08	30.18	45.67	0.3	105.85
Costa Rica	13	1984	1996	73.23	11.42	1.31	3,542	11.53	75.85	43.85	0.41	95.11
Dominican Rep.	13	1972	1985	68.28	19.91	1.33	2,304	21.51	47.73	25.85	0.42	149.17
Ecuador	19	1976	1994	136.41	31.06	1.06	4,494	14.70	51.61	49.68	0.32	124.03
Egypt	21	1975	1995	392.17	164.45	9.47	2,519	26.72	58.27	48.71	0.39	134.2
Fiji	14	1979	1992	15.65	2.34	0.15	5,003	17.66	100.48	17.00 .		108.12
Ghana	10	1975	1984	40.14	50.71	0.76	742	21.13	19.64	40.00	0.23	721.61
Guatemala	6	1977	1982	104.21	22.93	0.78	2,813	7.75	44.65	39.00	0.3	142.59
Haiti	9	1975	1983	29.10	25.28	0.24	2,025	13.41	46.72	22.44 .		93.79
Hungary	16	1982	1997	475.59	48.48	10.54	3,819	8.88	73.27	48.56	0.57	78.04
India	22	1974	1996	2,095.66	3,332.40	69.32	1,046	35.36	17.42	32.14	0.22	158.76
Indonesia	16	1981	1996	1,333.86	754.89	24.03	1,031	4.66	49.23	8.75	0.13	117.35
Iran	7	1976	1983	659.97	116.89	4.83	5,649	17.54	40.46	11.00 .		240.09
Jamaica	7	1976	1984	33.03	9.49	0.46	5,915	5.23	85.92	23.29	0.28	169.16
Jordan	21	1975	1995	43.83	7.24	0.41	3,911	15.70	122.61	16.43	0.11	134.02
Kenya	21	1975	1996	67.45	97.98	1.63	127	15.58	60.02	36.57	0.15	105.12
Korea	21	1976	1996	2,514.28	180.50	24.90	9,256	7.58	66.29	0.86	0.17	89.94
Madagascar	5	1978	1982	28.56	43.33	0.44	1,403	18.68	39.09	28.00	0.28	240.89
Malawi	11	1980	1990	11.21	36.03	0.33	1,092	23.11	55.06	20.82 .		147.37
Malaysia	23	1974	1996	471.78	62.27	6.70	3,671	7.03	125.50	10.70	0.18	110.76
Mauritius	22	1976	1997	27.03	4.00	0.82	2,580	16.72	116.15	29.82	0.34	102.36

Mexico	13	1984	1996	2,653.80	308.43	9.05	5,091	5.34	38.20	65.38	0.33	116.31
Morocco	20	1976	1995	262.18	80.95	2.95	4,635	18.06	53.96	39.05	0.24	103.83
Nepal	9	1977	1996	33.09	85.03	1.52	369	12.45	36.21	4.11 .		129.28
Pakistan	19	1973	1992	323.96	314.45	4.95	1,445	24.73	33.15	29.00	0.28	144.38
Panama	18	1977	1994	60.58	8.19	0.34	5,821	4.38	159.61	69.06	0.45	127.56
PNG	11	1976	1989	32.44	16.46	0.21	6,037	11.73	92.82	19.00 .		120.05
Peru	15	1979	1994	490.08	65.78	2.70	10,740	18.19	31.73	63.40	0.28	52.8
Philippines	21	1977	1997	623.64	234.01	8.73	2,567	14.36	59.95	22.05	0.33	91.97
Senegal	9	1974	1983	31.31	24.79	0.30	4,023	20.88	78.88	31.78	0.32	156.71
Singapore	26	1972	1997	441.28	11.77	2.87	12,771	0.83	354.36	20.27	0.22	86.22
South Africa	18	1976	1996	1,188.78	123.71	14.32	9,184	5.15	52.01	10.11	0.12	103.57
Sri Lanka	15	1980	1994	91.47	63.90	2.71	781	14.32	69.67	23.93	0.26	96.36
Syrian Arab Rep.	11	1977	1995	105.96	29.71	1.42	9,214	15.68	52.90	45.36	0.39	66.66
Thailand	13	1975	1994	832.04	279.45	12.34	3,010	12.17	60.13	11.00	0.15	98.77
Togo	5	1977	1983	10.52	11.37	0.04	3,170	16.20	112.41	13.00 .		161.93
Trinidad and Tobago	7	1976	1995	46.39	4.53	0.42	7,949	8.51	86.24	12.14	0.39	104.33
Turkey	22	1974	1996	1,189.25	220.59	8.61	6,161	12.39	27.79	27.73	0.21	118.09
Uruguay	20	1978	1997	153.97	13.04	1.46	7,660	12.80	42.30	65.45	0.47	75.01
Venezuela	27	1970	1996	616.19	58.00	3.99	9,166	9.47	48.32	37.19	0.23	117.09
Zimbabwe	12	1979	1993	56.51	38.74	1.74	3,498	17.21	47.46	3.75	0.12	147.62

Note: * Reported statistics are averages over all valid observations for the 1980s.
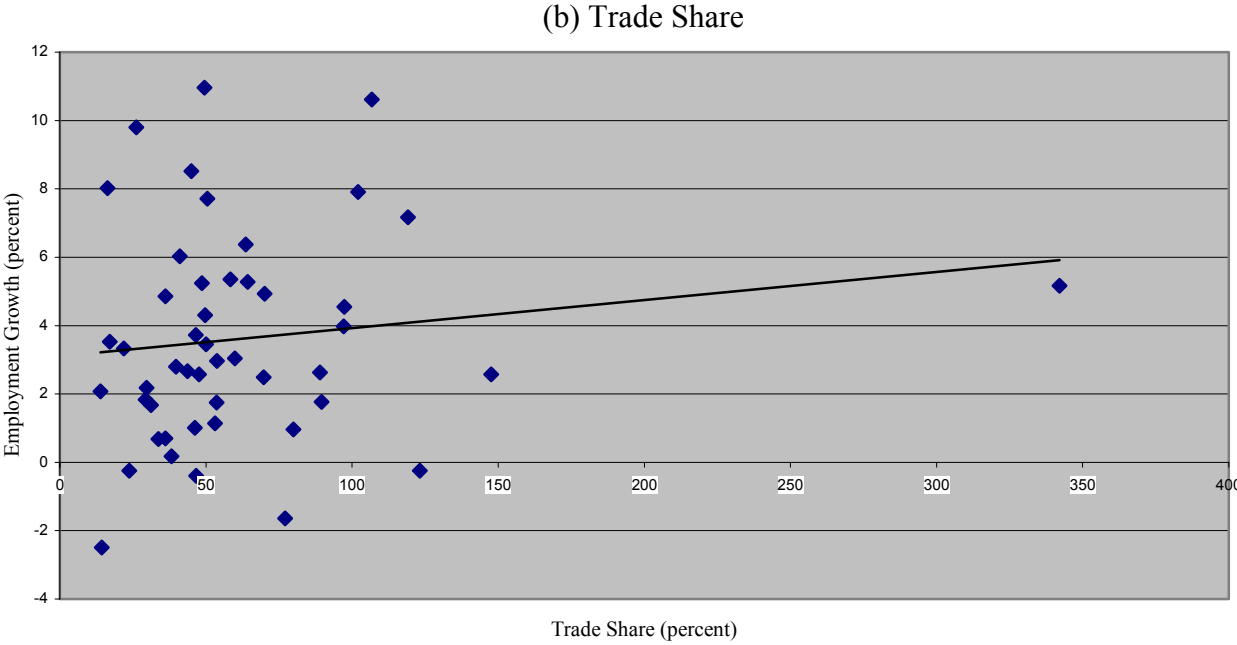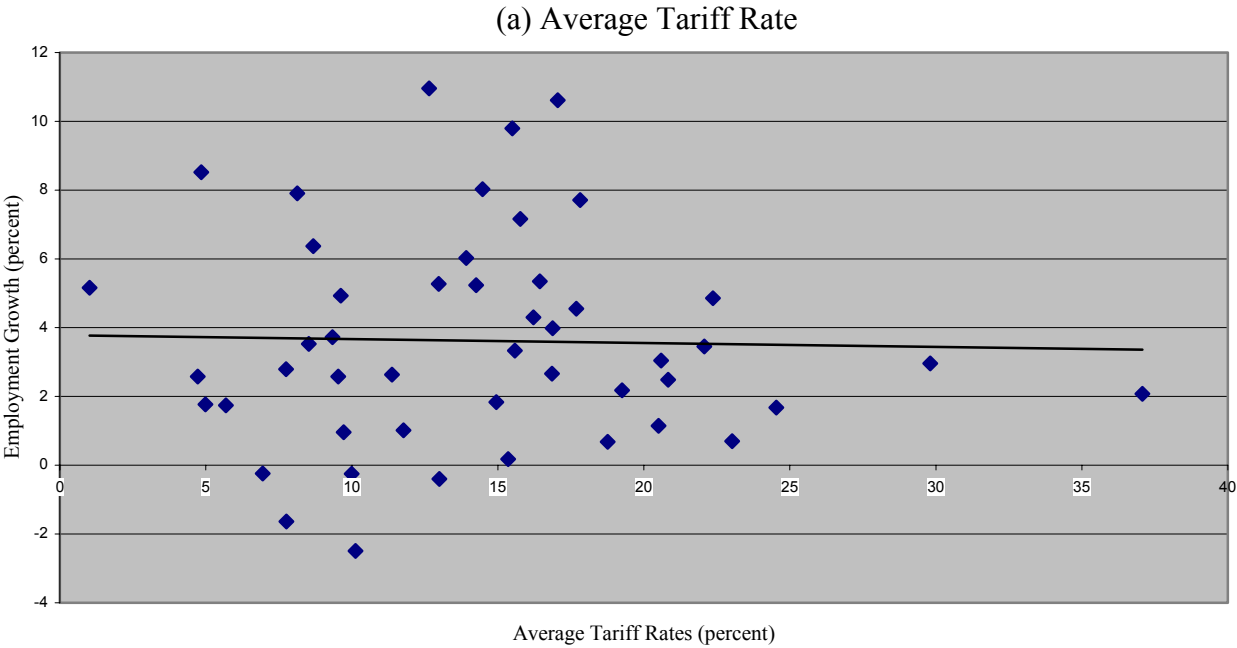
Figure 1: Employment Growth and Openness

(a) Average Tariff Rate

(b) Trade Share

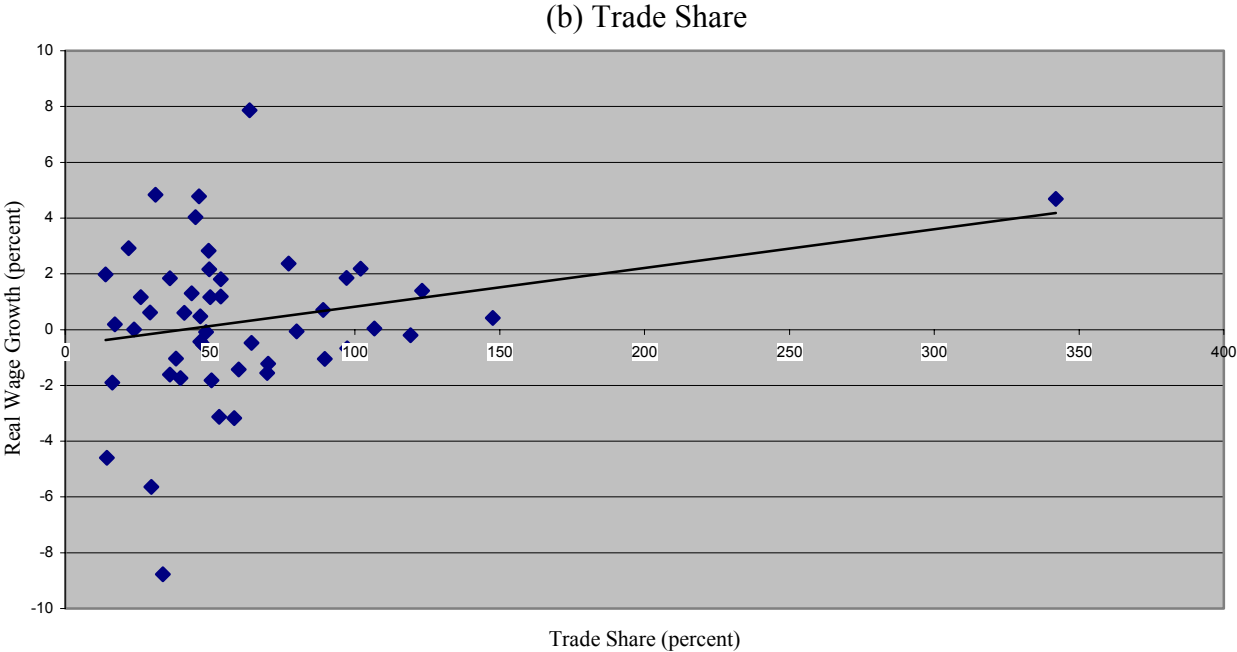# Figure 2: Real Wage Growth and Openness

(a) Average Tariff Rate

(b) Trade Share
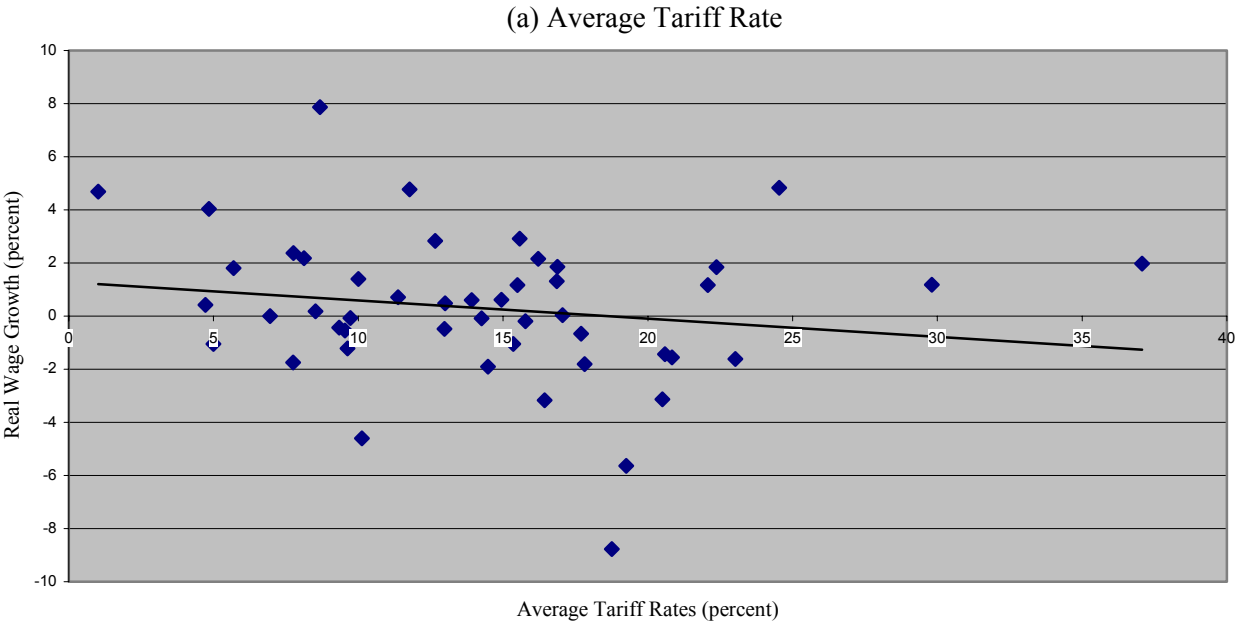
Figure 3: Employment Growth and Labor Market Rigidity

(a) ILO Convention Ratified

ILO Convention Ratified

(b) Aggregate Labor Market Rigidity Index
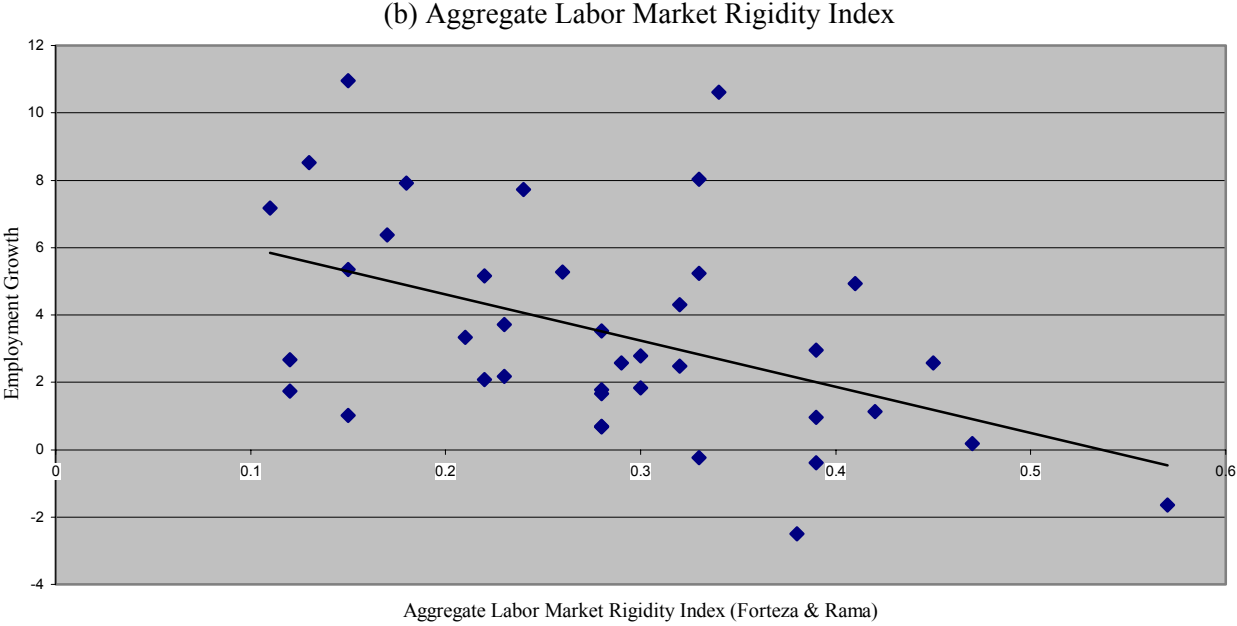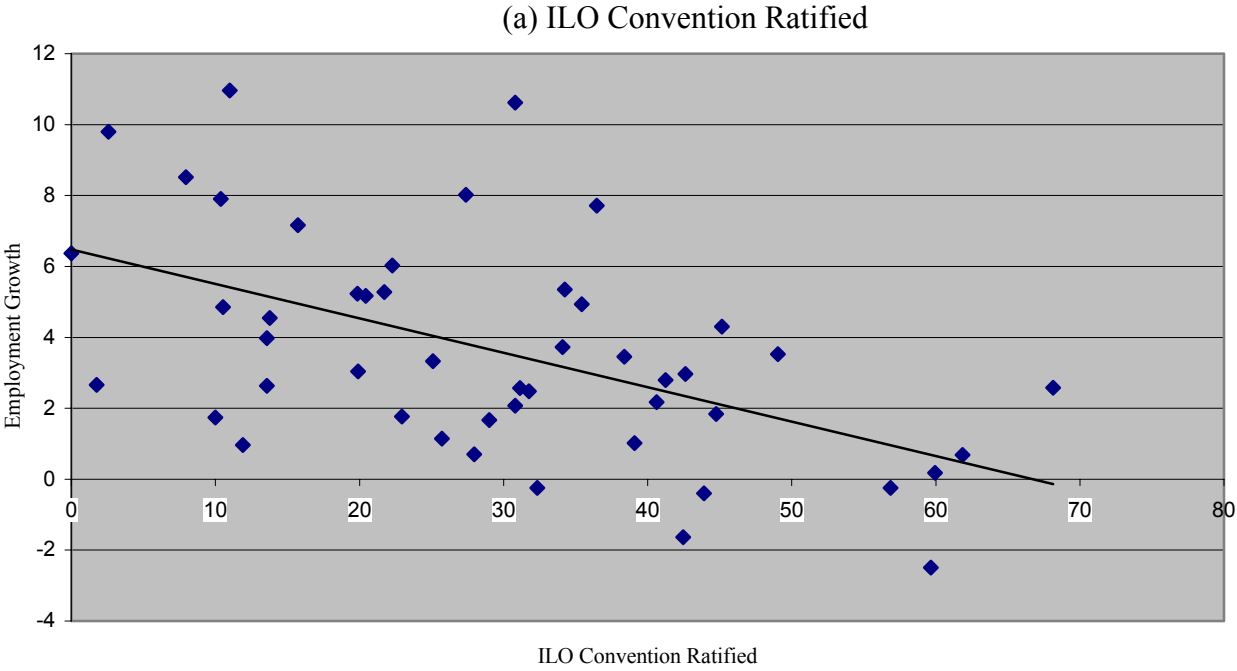

Aggregate Labor Market Rigidity Index (Forteza & Rama)

Figure 4: Real Wage Growth and Labor Market Rigidity

(a) ILO Convention Ratified

(b) Aggregate Labor Market Rigidity Index