

Economic Reform and Labor Unions: A General-Equilibrium Analysis Applied to Bangladesh and Indonesia

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Noting the trend toward more independent trade unions in developing countries, this article examines whether the presence of unions strengthens or weakens the benefits to be gained from economic policy reform. We show that the presence of "passive" unions—ones that choose their wage-employment contract given the firm's cost-minimizing strategy—increases the welfare gains from trade liberalization, because trade reform lowers the wage premium enjoyed by the unionized sector, reducing a distortion in the labor market. These gains are amplified when the unions are "active," namely, when they negotiate a contract with the firm that is off its labor demand curve. Such a contract results in featherbedding—paying workers more than their marginal product—and trade reform reduces the amount of featherbedding. The policy implication for Bangladesh—a country with strong trade unions and a protected unionized sector—is that the benefits of further trade liberalization may be greater than otherwise predicted. In Indonesia, where both unionization and import tariffs are low, allowing greater independence to unions may preserve flexibility and reward workers better than the current minimum-wage policy.

The world is moving toward more openness, political freedom, and civil liberties. Freedom of association and organization is now accepted as a basic human right in most societies. In many developing countries, workers have increased their demands for the right to associate, organize freely, and bargain collectively. Independent trade unions are now appearing in countries where in the recent past only state-sponsored unions were allowed. The transitions toward democracy and independent trade unions in Chile and Korea in the late 1980s are dramatic examples of this process. While the share of unionized labor in the workforce has been declining in many industrial countries, at least partly as a consequence of the increasing share of services in total employment, it has been rising in developing countries because of greater industrialization and democratization.

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The political and social effects of independent trade unions are generally thought to be positive. Unions fought for democracy in Poland, equality and the end of racial segregation in South Africa, and national independence in Bangladesh, India, and Sri Lanka. The impacts of labor unions on efficiency, equity, and growth, however, are not clear. (For a detailed discussion of the economic effects of unions see Freeman and Medoff 1984.) On the one hand, unions can act as monopolists, increasing their members' wages and discouraging investment and job creation. The wage premia that unions obtain for their members are often at the cost of slower growth and lower wages and employment for unorganized workers (see Blanchflower and Freeman 1990, Moll 1993, Panagides and Patrinos 1994, Park 1991, Standing 1992, and Teal 1994). On the other hand, Freeman (1980), Lee and Nam (1994), and Panagides and Patrinos (1994) present evidence that unions improve the distribution of income and reduce discrimination against women and ethnic minorities. Other evidence (Standing 1992) indicates that unions can help raise productivity and improve competitiveness.

This article does not address the question of whether unions are "good" or "bad" for development. Taking as given the fact that independent trade unions are going to play a more important role than they did in the past, we explore the implications of this fact for economic policy. This focus is relevant for analytical and policy reasons. On the analytical side, economic reform in developing countries has typically been evaluated assuming that labor markets are perfectly competitive (see, for example, Devarajan, Lewis, and Robinson forthcoming). This assumption is becoming increasingly heroic. How would the results change when union behavior is explicitly incorporated into the analysis? We develop a stylized, two-sector general-equilibrium model and graft onto it different types of unions. "Passive" unions take the firm's labor demand curve as given and determine the optimal wage markup, similar to unions in de Melo and Tarr (1992). "Active" unions negotiate a wage and employment contract that captures some of the inframarginal rents, as described by McDonald and Solow (1981) and Johnson (1990). In active unions, firms are off their labor demand curves, and featherbedding occurs as excess labor is hired and workers are paid more than their marginal product. We test whether the outcome of economic reform is different under each of these specifications of union behavior.

Although the analytical motivation of the exercise is clear, the policy relevance requires some explanation. After all, most workers in developing countries are in the rural and informal sectors where unions do not exist. Formal sector employment is only around 17 and 57 percent of total employment in low- and middle-income countries, respectively. Nonetheless, there are two reasons to pay attention to the role of unions. The first is particularly relevant to low-income countries in South Asia and Africa, where the strategic importance of the unionized sector is much greater than is indicated by its share in total employment or gross domestic product (GDP). For example, Bangladesh's manufacturing sector represents only around 10 percent of GDP, but manufacturing is

by far the most important foreign-exchange earner, responsible for some 70 percent of exports. Trade unions in Bangladesh are particularly important in manufacturing, especially textiles (cotton and jute). Jute, which represents around one-third of net exports, has been in a crisis caused by low competitiveness and high unit labor costs, and the government has embarked on a massive restructuring program. (See World Bank 1995 for estimates of unit labor costs in Bangladesh's jute industry and comparisons with other Asian countries.) Understanding the structure of the labor market, including the role of unions, and its links with the rest of the economy is key to the success of this effort. Other examples of strategic sectors in less-developed countries where labor unions play an important role include the textiles industry in Egypt, coal mines in India, and oil extraction in Nigeria.

The second reason is particularly relevant for fast-growing middle-income countries in East Asia and Latin America. Those countries exploited their comparative advantage in labor-intensive goods to achieve rapid growth in exports and overall growth. Often they did not allow independent unions, which some argue helped to keep wages low and maintain competitiveness. There is increasing evidence that labor repression was not necessary for export expansion and economic growth in East Asia. (For example, see Fields 1994 or Freeman 1993.) But workers in many of these countries have become increasingly vocal in demanding free unions, and the international community is pressuring countries to respect workers' rights. Indonesia is a good example (as are China, Malaysia, and Singapore). Until recently, labor legislation in Indonesia limited the right to form unions, and only one large government-supported union, SPSI (Serikat Pekerja Seluruh Indonesia, the All-Indonesia Workers' Union), is operating. The Indonesian government is under domestic and international pressure to liberalize labor legislation. Understanding the implications of allowing new, more independent unions is key to enhancing worker welfare without jeopardizing Indonesia's tremendous economic achievements.

Building on the insights of a stylized model, we analyze the interaction between union behavior and economic policy in both Bangladesh and Indonesia using more detailed, country-specific models. In Bangladesh, unions are free, but markets are heavily protected. Although only about 3 percent of the labor force is unionized, unions are powerful players in the labor market. They have strong ties to political parties and are concentrated in urban centers where they can exert pressure on government. Particularly strong in highly protected or subsidized sectors, unions have been increasing their pressure on the government to ensure continued protection and support. This pressure has taken the form of widely publicized nationwide strikes and *hartals* (lockouts with civil protest), which have given industrial relations in Bangladesh a bad name. How does this situation affect the economic reform process? The existence of militant unions clearly raises the political cost of economic liberalization policies.

In contrast, Indonesia has adopted more market-friendly policies and low levels of protection. This has led to a boom in manufacturing exports and for-

foreign direct investment and has put Indonesia on the path to rapid export-oriented, labor-intensive growth. The government has resisted pressure to liberalize labor laws and has tried to ensure workers' political support by increasing legislated benefits. Minimum wages were raised substantially every year between 1989 and 1994, almost tripling (in nominal terms) during this period. The government also introduced a Workers' Social Security Law including life insurance, retirement benefits, free health care, and workers' compensation, raising labor costs 12 percent. Yet, labor unrest continues to rise; the number of work-days lost because of (mostly illegal) strikes increased thirty-fivefold between 1989 and 1992.

In section I we describe the changes in the labor market when there are either passive or active unions. We present a stylized model with each type of union behavior. In sections II and III we describe the computable general equilibrium (CGE) models and simulation results for Bangladesh and Indonesia, respectively. Section IV concludes.

I. STYLIZED MODEL

To focus on the effects of various types of union behavior, we begin with a simple, two-factor, two-sector general equilibrium model. The two sectors are agriculture (A) and manufacturing (M), with manufacturing being the protected sector. Each sector produces output by a production function using the two factors, labor (L) and capital (K):

$$(1) \quad X_A = f(L_A, K_A)$$

$$(2) \quad X_M = g(L_M, K_M).$$

Capital is fixed and sector-specific. Factor supplies are held constant to focus on the static efficiency gains from trade liberalization. Allowing factor supplies to be endogenous requires an explicit intertemporal model. Devarajan and Go (forthcoming) show that in such a model the welfare effects are not very different. That capital is sector-specific is also not crucial (Devarajan and Offerdal 1989). Here labor is the only mobile factor. The supply of labor is fixed:

$$(3) \quad L_A + L_M = L^*.$$

Although labor is mobile, we observe a difference in the returns across sectors:

$$(4) \quad w_A = P_A f_{L_A}$$

$$(5) \quad w_M = P_M g_{L_M}.$$

Whether we attribute this difference to productivity differences or union premia will play a crucial role in the analysis.

We can define the average wage, w , as the wage that solves:

$$(6) \quad w_A L_A + w_M L_M = w L^*.$$

We can now define the wage premium, ϕ , in each sector as the sector's wage relative to the average wage:

$$(7) \quad \phi_A = \frac{w_A}{w}$$

$$(8) \quad \phi_M = \frac{w_M}{w}.$$

In what follows, we assume that the ϕ s are exogenous for the benchmark (no-union) case. This implies that the observed differences in labor productivity will remain even after labor is reallocated between sectors. We assume that these differences are caused by sectoral attributes (such as differences in technology or capital stock) rather than by individual characteristics. Consequently, there will be welfare costs, or second-best effects, if labor moves from a high-productivity to a low-productivity sector following a policy shock. This specification of the labor market allows us to maintain the factor payment differentials observed in the base data, which are an important feature of the actual country models. For the union cases, we assume that ϕ_M is the outcome of the union's optimizing behavior (for passive unions) or the outcome of a bargaining solution between unions and management (for active unions). In these cases, the premium can change following a policy change, giving rise to different welfare effects.

The demand side of the stylized model is standard. Imports and domestically produced goods in the same sector are imperfect substitutes (see, for example, Devarajan, Lewis, and Robinson forthcoming). The single, representative consumer allocates expenditure in fixed shares over the "composite commodities" (a constant elasticity of substitution—CES—aggregate of imports and domestic goods). The small country faces exogenous world prices in both exports and imports. There is a tariff on imports of manufactured goods. All income accrues to the representative consumer, including the tariff revenue collected, which is rebated in a lump-sum fashion.

Passive Unions

To incorporate union behavior, we attribute all differences in payments to labor in the manufacturing sector to a union markup, $\phi_M > 1$. The union chooses this markup to maximize its utility subject to the firm's labor demand curve. The payment differential to labor in agriculture is constant ($\phi_A < 1$).

The passive union takes the derived demand for labor as given and chooses the wage premium that maximizes its utility over wages and employment. Fol-

lowing de Melo and Tarr (1992), we assume that the union has a Cobb-Douglas utility function:¹

$$(9) \quad U = (w\phi_M - w)^\mu (L - \bar{L}_i)^{(1-\mu)}$$

where U is the union's utility over wages and employment; w is the minimum acceptable wage, which we take to be the economywide average wage; ϕ_M is the wage premium paid to union workers; L is the number of workers hired; and \bar{L}_i is the minimum acceptable employment for union type i , which equals P if passive and A if active.

Manufacturing output, X_M , is produced using a CES function over two inputs, labor (L) and capital (K):

$$(10) \quad X_M = \bar{A}[\alpha L_M^{-\rho} + (1 - \alpha)K_M^{-\rho}]^{(-1/\rho)}.$$

The elasticity of substitution between labor and capital in production is:

$$(11) \quad \sigma = \frac{1}{(1 + \rho)}.$$

Given this production technology, the derived demand for labor is:

$$(12) \quad L = \left(\frac{\alpha P_M X_M}{\phi_M w} \right)^\sigma \left(\frac{X_M}{\bar{A}} \right)^{(1-\sigma)}$$

where P_M is the output price of manufacturing. Substituting the labor demand curve into the union's utility function and choosing the wage premium to maximize utility, we find that the optimal wage premium ϕ_M solves:

$$(13) \quad \frac{(\phi_M - 1)}{\phi_M} = \frac{\mu}{(1 - \mu)\sigma} \frac{(L - \bar{L}_P)}{L}.$$

The endogenous wage differential creates an additional channel for welfare changes following a policy shock such as trade liberalization. For example, as the demand for labor in the union sector declines, the wage differential declines, reducing the labor market distortion. This contributes to the welfare gains from the policy shock.

Active Unions

McDonald and Solow (1981) demonstrate that the wage and employment level chosen with a passive union is not efficient. Consider a union with the utility

1. de Melo and Tarr (1992) use passive rather than active behavior to describe unions in the U.S. auto and steel industries because they find little evidence that U.S. producers in these sectors are off the derived demand for labor.

function described in equation 9; a passive union will maximize its utility at point A in figure 1.² However, the union can be made better off, and the producer no worse off, with a different combination of wages and employment. For example, consider the isoprofit curve—the locus of wage-employment combinations that yields the same profit to the firm—through A. There are points on this isoprofit curve that are preferred by the union. In equilibrium, the union's indifference curve will be tangent to the producer's isoprofit curve (point B). Note that the equilibrium wage and employment are not on the derived demand curve for labor. The set of equilibrium points—where the producer's isoprofit curves and the union's indifference curves are mutually tangent—defines the contract curve. We maintain sector-specific capital so profit is the return to capital. To derive the equilibrium wage markup (ϕ_M), first consider the producer's profit function (where π equals profit) treating manufacturing as the unionized sector:

$$(14) \quad \pi = P_M f(L, K) - \phi_M \omega L.$$

The slope of the profit function is:

$$(15) \quad dW/dL = \frac{(P_M f_L - \phi_M \omega)}{L}$$

where $W = \phi_M \omega$. From the union's utility function in equation 9, the slope of the indifference curve is:

$$(16) \quad dW/dL = \frac{(\mu - 1) (\phi_M \omega - \omega)}{\mu (L - \bar{L}_A)}.$$

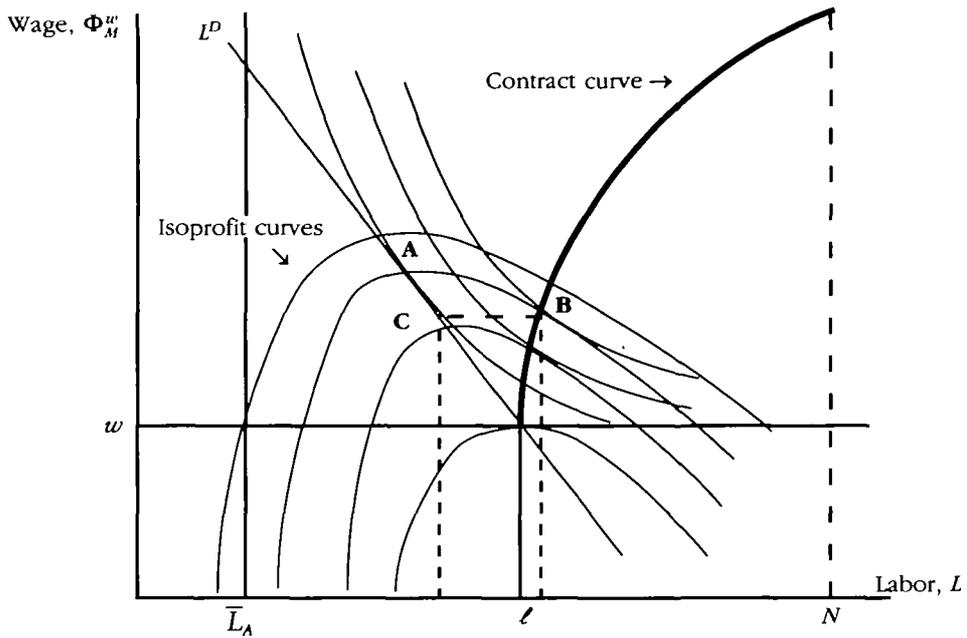
Equating equations 15 and 16, we define the contract curve as the locus of points $(\phi_M \omega, L)$ satisfying:

$$(17) \quad \frac{(P_M f_L - \phi_M \omega)}{L} = \frac{(\mu - 1) (\phi_M \omega - \omega)}{\mu (L - \bar{L}_A)}.$$

The union bargains with the producer to hire more labor at a given wage than the firm would otherwise have at that wage. This excess labor can be described as featherbedding. Note that there is "excess" labor relative to the case with no unions at the same wage. If the reference point is the passive union, the producer may well be gaining with an active union. In terms of figure 1, excess labor is the horizontal distance between point B on the contract curve and point C on the derived demand for labor, at the agreed upon wage. As shown in figure 1, the contract curve has a positive slope. Under certain conditions, it can have a negative slope. However, because the contract curve is to the right of the labor demand curve, featherbedding is always positive.

2. Our utility function differs slightly from that in McDonald and Solow (1981). We include a minimum acceptable employment level as well as the minimum acceptable wage level that they include.

Figure 1. *Active Union Behavior*



The point on the contract curve at which the firm and union agree depends on the relative bargaining strengths of the two. McDonald and Solow (1981) describe two extreme cases: a dominant union and a dominant firm. In the case of the dominant union, equilibrium is reached at the point on the contract curve associated with zero profit for the producer. When the firm is dominant and the union has no bargaining strength, the firm faces w , the union's minimum acceptable wage, and maximizes profit at l . This is the level of employment and wage at which the labor market is competitive, which we take to be the point at which the union has no bargaining power.

To summarize, we describe the union's bargaining strength as θ , the ratio of the wage it received from the bargaining process to the wage it would get (w_{\max}) if all revenues accrued to labor:

$$(18) \quad \theta = \frac{\phi_m w}{w_{\max}}$$

where

$$(19) \quad w_{\max} = \frac{P_M X_M}{L}$$

where $P_M X_M$ equals revenue from sales; as θ approaches 1, the union dominates.

Because both the contract curve and the derived demand for labor shift following a policy shock, we cannot determine, a priori, the change in featherbedders following a policy shock that changes output in the unionized sector. In the case

Table 1. *The Structure of the Stylized Model*

Item	Value	
	Agriculture	Manufacturing
Tariff	0.00	0.30
Output share	0.50	0.50
Share of sectoral value added paid to capital	0.75	0.41
Share of sectoral value added paid to labor	0.25	0.59
Share of capital employed by sector	0.40	0.60
Share of labor employed by sector	0.65	0.35
Wage differential	0.40	1.75

with active unions, the producer shares the return to capital (profit) with union labor.³ Table 1 provides a description of the structure of the model.

Simulation Results

We simulate trade liberalization (removing the 30 percent tariff protecting the unionized sector) in the stylized model with various assumptions about union behavior. In the case with no unions, imports of the formerly protected good increase 31.3 percent and domestic production declines 1.1 percent (see table 2). Exports of both goods increase to maintain the exogenous trade balance. Despite the elimination of the trade distortion, there are no welfare gains. We define welfare as equivalent variation, the amount the consumer would be willing to pay to consume at the original prices before the policy shock. With this specification, a negative number indicates a welfare gain. However, for reporting purposes, we change the sign so that a positive number indicates a welfare gain. As the economy adjusts to the policy shock, labor moves into low-productivity agriculture and out of high-productivity manufacturing, counteracting the welfare gain created by removing the trade distortion. By coincidence, in table 2 the labor market distortion effects exactly offset the welfare gain from trade liberalization.

With passive unions, output and trade change in the same direction as in the model with no unions (table 2). (We assume that the slope of the labor demand curve falls in absolute value more slowly than that of the union's indifference curve, so that second-order conditions are satisfied.) Trade liberalization shifts the derived demand for labor in the union sector downward, reducing the labor market distortion and generating welfare gains (see equivalent variation in table 2). The decline in manufacturing output is smaller, compared with the model with exogenous wage differentials, because labor costs decline as the union premium declines (see wage differentials). Likewise, the decline in the demand for labor in manufacturing is smaller than it is in the model with exogenous wage differentials.

3. The calibration programs for the two different union models are available from the authors on request.

Table 2. *The Impact of Removing the 30 Percent Tariff in the Manufacturing Sector under Alternative Specifications of the Labor Market*

Item	Exogenous wage differentials (no unions)		Passive union				Active union		Active union and bargaining	
	Agriculture	Manufacturing	$\mu = 0.3$		$\mu = 0.9$		Agriculture	Manufacturing	Agriculture	Manufacturing
			Agriculture	Manufacturing	Agriculture	Manufacturing				
<i>Percentage change from base level</i>										
Employment	1.01	-1.88	0.82	-1.53	0.07	-0.13	0.49	-0.51	-0.29	9.44
Real market-clearing wage	1.10	1.10	1.39	1.39	2.56	2.56	1.98	1.98	4.64	4.64
Featherbedders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.82	0.00	-18.16
Wage differential	0.00	0.00	0.00	-0.58	0.00	-2.87	0.00	-1.99	0.00	-11.58
Real sectoral wage	1.10	1.10	1.39	0.80	2.56	-0.38	1.98	-0.05	4.64	-7.47
Real sectoral return to capital	2.63	-1.74	2.64	-1.50	2.67	-0.58	2.73	-0.81	4.18	5.93
Output	0.25	-1.11	0.20	-0.90	0.02	-0.08	0.12	-0.30	-0.07	5.39
Exports	15.90	19.71	15.67	20.15	14.75	21.90	15.11	21.40	11.08	32.94
Imports	-16.39	31.31	-16.27	31.32	-15.77	31.35	-15.90	31.38	-12.39	32.55
<i>Equivalent variation*</i>	0.01		0.17		0.81		0.70		6.19	

a. Measured in units of the numeraire good. Equivalent variation is a weighted average over households, and a positive value indicates a welfare gain.

Source: Authors' calculations.

Figures 2 and 3 show the difference between the no-union and union cases. In figure 2, M 's labor demand curve slopes from left to right, while A 's labor demand curve slopes from right to left. The initial equilibrium is portrayed as (w_M, w_A) . With no unions, the difference between w_M and w_A remains constant, so that for a given downward shift in M 's labor demand (because of trade liberalization), the new wages are w'_M and w'_A .

With a passive union, the initial equilibrium (also w_M, w_A) is determined by the tangency between the union's indifference curve and L_D^M (figure 3). When the labor demand curve shifts downward, the new point of tangency with the union's indifference curve is at a lower manufacturing wage w''_M . The wage differential has narrowed, implying that manufacturing does not contract by as much as in the no-union case.

Interestingly, when there is a high weight on wages in the union's utility function, there is a bigger decline in the wage differential than when there is a low weight on wages—a decline of 2.9 percent rather than 0.6 percent. The smaller wage differential translates into a larger welfare gain when the weight on wages is high; the change in equivalent variation is 0.8 rather than 0.2 in the low-weight case. As a result of the decline in the wage markup, the payment to labor in manufacturing declines 0.4 percent when the union cares more about wages than employment. It increases 0.8 percent when the union cares more about employment than wages. Likewise, fewer union jobs are sacrificed in the high-

Figure 2. *The Impact of Trade Liberalization on Employment and Wages in the Case with No Unions*

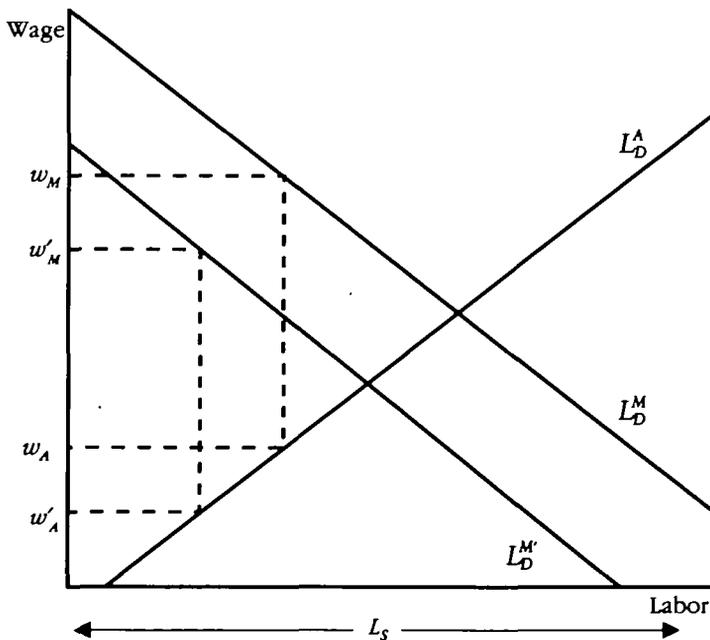
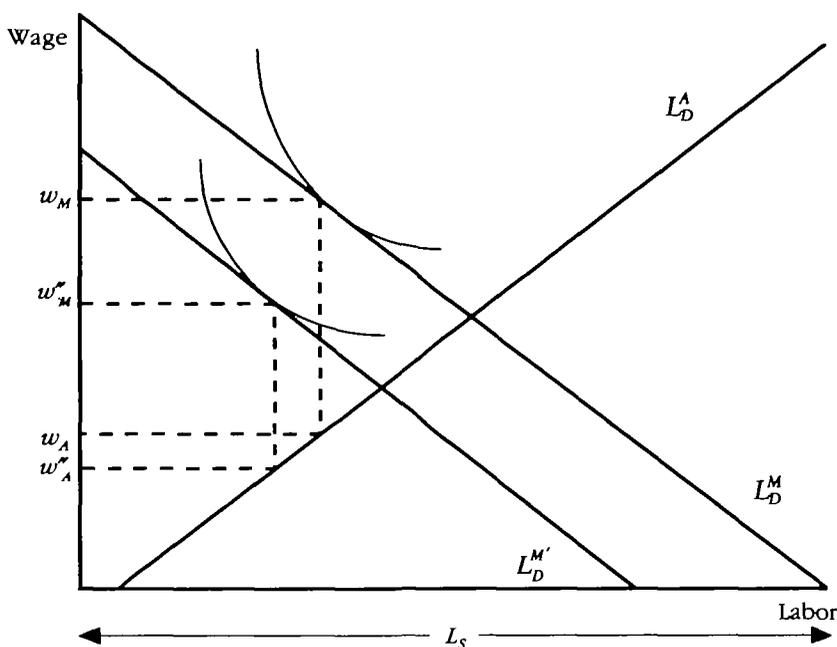


Figure 3. *The Impact of Trade Liberalization on Employment and Wages in the Case with Unions*



weight version of the passive union—they decline 0.1 percent rather than 1.5 percent.

This may seem like a counterintuitive result: a union that cares more about wages, as represented by a higher weight on wages in its utility function, sacrifices the wage premium rather than employment when the sector contracts. To resolve this apparent paradox, recall that the union has both a minimum acceptable wage and employment level in its utility function. We take the minimum acceptable wage to be the economywide average wage. The unobserved parameter is the union's minimum acceptable employment level, \bar{L}_p . We therefore calibrate this parameter from the observed wage and employment levels and the other parameters of the union's utility function (including the weight on wages, μ). Thus, a higher μ implies a higher \bar{L}_p for consistency with the observed wage and employment levels. It follows that in response to a negative shock, with a higher weight on wages, employment has less "room" to fall, so that the adjustment occurs in wages. This paradox appears in de Melo and Tarr (1992) and Thierfelder and Shiells (1996).

With active unions and the removal of protection, the wage differential declines 2.0 percent. The number of productive workers in the economy increases as the number of featherbedders declines 0.8 percent. The changes in output, trade, and factor allocation resemble those in the model with no unions. Be-

cause of the reduction in labor costs, manufacturing output declines 0.3 percent, which is less than the decline in the case with exogenous wage differentials. Similarly, the demand for labor declines 0.5 percent, less than in the case with exogenous wage differentials, in which the demand for labor in manufacturing declines 1.9 percent.

Suppose that, anticipating the trade liberalization, the union makes some concessions in terms of its bargaining strength. This scenario produces more dramatic results. The supply of productive labor increases as the number of featherbedders declines 18.2 percent. The demand for labor in manufacturing increases 9.4 percent. The market-clearing wage increases 4.6 percent, indicating that the changes in labor demand dominate the increase in labor supply. However, given the 12.0 percent decline in the union premium, the wage for workers in the manufacturing sector declines 7.5 percent. The labor market changes dominate tariff elimination: output in the formerly protected sector actually increases 5.4 percent, while output of the other sector declines slightly (0.07 percent). This is the only scenario in which the return to capital in manufacturing increases, reflecting the increase in manufacturing output.

Two changes in the labor market affect output in the formerly protected sector: (1) the wage differential declines in the union sector and (2) the supply of labor increases. To decompose the effects, we consider trade liberalization in the model with an exogenous wage differential. We reduce the wage differential to the level observed in the case with trade liberalization and union concessions. We find that output of manufacturing increases because of the decline in labor cost. Manufacturing output increases more (and agricultural output declines less) when the labor supply adjusts because of the decline in the number of featherbedders.

Simulations with the stylized model lead to four general conclusions:

1. Loss of protection in the unionized sector results in additional welfare gains from trade liberalization.
2. With passive unions, the reduction in the union wage premium results in welfare gains, whose magnitude depends on union preferences.
3. With active unions, both the decline in the wage differential and the fall in the number of featherbedders contribute to the welfare gain.
4. If unions make bargaining concessions, the labor market changes can dominate the effect of tariff elimination on output.

II. BANGLADESH

The structure of the labor market and the role of unions in Bangladesh are representative of those in other South Asian countries. Bangladesh has three types of labor markets: formal, rural informal, and urban informal. The formal labor market is characterized by a contractual employment relationship and governed by labor laws and regulations that aim to protect workers, such as minimum wages and allowances and limitations on the employer's ability to fire

employees. The rural and urban informal labor markets are not covered by protective labor regulations. The informal sector dominates the labor market. In 1991, 47.2 percent of the labor force were classified as unpaid family workers, 15.4 percent were classified as self-employed, 13.9 percent were classified as casual workers (day laborers), and only 11.7 percent had regular full-time wage employment.⁴

Despite the small size of the formal sector, Bangladesh has a large number of labor unions. In 1992, there were 4,065 registered unions, with a total membership of 1,648,783, which represents some 3 percent of the labor force. The unions are organized into roughly 700 union federations. Almost all federations have links with political parties, with the three largest federations acting as the labor front of the three major parties. (For a more detailed description of the labor movement in Bangladesh, see Rahman 1994.) Unions and union federations are very active in Bangladesh's political and economic life. They were key partners in the coalition that ended the rule of General Ershad and restored democracy to Bangladesh in 1991. On the economic front, they entered into agreements with government in 1984, 1991, and 1992 to raise legislated labor benefits and protections.

For most of Bangladesh's existence, the government has provided high protection to domestic industries. In the late 1980s the average manufacturer selling its products domestically enjoyed more than an 80 percent effective protection rate from tariffs alone. Some industries—like textiles, soap and detergents, and iron and steel—were even more highly protected by both tariffs and quantitative restrictions on imports. The situation started to change in the 1990s. In 1992 import discriminating taxes other than customs duties were replaced by the largely trade-neutral value added tax and supplemental duties; with some exceptions, the maximum tariff rate was reduced steadily from 400 percent to around 50 percent; and many quantitative restrictions were removed. More trade liberalization is being discussed in Bangladesh, including further reduction and compression of customs duties, removal of remaining trade-related quantitative restrictions, and reforms to facilitate the process of import clearance.

As can be expected, there is a lot of political resistance to trade liberalization in Bangladesh, much of it from labor unions. The existence of strong labor unions in Bangladesh clearly increases the political cost of trade liberalization. How does it affect the economic benefits to be gained from liberalization? To answer this question, we turn to a more detailed general equilibrium model of Bangladesh, which has many of the core features of the stylized model in section I.

Model Description

Naturally, some of the features of the Bangladesh model are more complex, making the effects of a union less clear than in the case of the stylized model. Of the thirty-five sectors in the model, nine are unionized. The unionized sectors

4. Of the labor force, 11.4 percent are classified as "employers" and 0.4 percent are "not reported." The data references in this section come from Bangladesh Bureau of Statistics (1995).

are cotton yarn, paper, leather, fertilizers, cement, basic metals, metal products, petroleum, and electricity and gas. (See Devarajan, Ghanem, and Thierfelder 1995 and Dahl and Mitra 1991 for a more detailed description of the Bangladesh model.) The model contains a Cobb-Douglas production function over an aggregate of intermediate goods and a CES aggregate of four inputs: rural labor, urban informal labor, urban formal labor, and capital.

Capital is sector-specific, representing the producer's profit that is shared with the active unions. The assumption of sector-specific capital, which reflects the segmented nature of capital markets in Bangladesh, is not crucial (see Devarajan and Offerdal 1989). The original data for Bangladesh do not indicate capital use by sector. We construct the input capital by allocating some of the value added by the other labor inputs to it. Each of the three households in the base data receives income from one labor category. To maintain the households' structure, we restore the capital income (net of payment to featherbedders where applicable) to the appropriate household, based on the share of value added that each labor category contributed to the construction of capital input. When there are no active unions, the income to each household is identical to the case with no capital inputs.

Because there are intermediate goods, there is the potential for offsetting changes in demand following a policy shock such as trade liberalization. Production may not always decline in sectors where protection is eliminated. It can sometimes rise in response to increased demand from sectors that use the formerly protected good as an intermediate input.

The structure of protection also affects the distribution of output among the unionized sectors. In Bangladesh, not all unionized sectors receive protection (see table 3). For example, fertilizer and electricity and gas have zero tariffs. Likewise, some nonunion sectors receive protection. Unlike the stylized model, tariff elimination does not exclusively target production in the unionized sector.

In contrast to the stylized model, there are additional (nonunionized) labor groups in Bangladesh. There is potential for factor substitution in response to

Table 3. *Characteristics of Unionized Sectors in Bangladesh*

<i>Sector</i>	<i>Tariff</i>	<i>Share of output</i>	<i>Share of urban formal employment by sector</i>	<i>Share of sectoral value added paid to urban formal workers</i>
Cotton yarn	2.30	0.01	0.01	0.22
Paper	1.31	0.01	0.01	0.15
Leather	1.09	0.01	0.01	0.25
Fertilizers	0.00	0.01	0.03	0.36
Cement	0.41	0.00	0.01	0.33
Basic metals	0.56	0.01	0.04	0.38
Metal products	0.43	0.04	0.25	0.31
Petroleum	0.41	0.02	0.08	0.23
Electricity and gas	0.00	0.01	0.04	0.23

Source: Authors' calculations.

Table 4. *Macroeconomic Effects of Trade Liberalization in Bangladesh under Alternative Specifications of the Labor Market*

Item	Exogenous wage differentials (no unions)	Active union		
		No concessions	Low concessions	High concessions
<i>Real market-clearing factor return (percentage change from base level)</i>				
Rural	6.09	6.09	6.31	6.51
Urban informal	2.07	2.09	2.25	2.52
Urban formal	-0.56	-0.16	1.26	2.26
Capital	10.37	10.49	10.10	9.77
<i>Real average factor return (percentage change from base level)</i>				
Rural	6.08	6.07	6.30	6.50
Urban informal	2.75	2.75	2.94	3.22
Urban formal	-1.29	-1.42	-3.81	-5.88
Capital	5.47	5.46	5.74	6.00
Featherbedders	0.00	-1.52	-33.91	-63.75
Total exports	78.24	77.57	76.91	76.76
Total imports	30.91	30.73	30.56	30.54
<i>Unemployment (share of urban formal labor supply)</i>				
	0.00	0.00	0.00	0.00
<i>Equivalent variation^a</i>				
	20.08	20.07	21.34	22.45

a. Measured in units of the numeraire good. Equivalent variation is a weighted average over households, and a positive number indicates a welfare gain.

Source: Authors' calculations.

changes in the cost of unionized labor. This implies stronger spillover effects on the returns to other labor groups.

Simulation Results

Tariffs in Bangladesh mainly protect the urban formal workers. In a model with no unions (the observed factor payment differentials are treated as exogenous), trade liberalization causes the real average return to urban formal workers to decline 1.3 percent, the real average return to rural labor to increase 6.1 percent, and the real average return to urban informal workers to increase 2.8 percent (see table 4).⁵ The contracting sectors—such as cement, basic metals, and metal products, which had tariffs of 41, 56, and 43 percent, respectively—use urban formal workers relatively intensively.

If we assume that active unions in Bangladesh explain the observed wage differentials, the income distribution following trade liberalization changes slightly. The real return to urban formal workers decreases 1.4 percent rather

5. These numbers differ in magnitude but not direction compared with our earlier analysis of Bangladesh (Devarajan, Ghanem, and Thierfelder 1995). This model differs from the earlier model in that we introduce sector-specific capital and factor payment differentials for urban formal workers.

than 1.3 percent. The change is caused by the increased supply of productive urban formal workers, as the number of featherbedders declines 1.5 percent.

For the same reason, the factor allocation and production changes are not as extreme as when there are no unions. For example, the wage differentials for cement, basic metals, and metal products decline 4.7, 5.5, and 2.9 percent, respectively, in the model with active unions (see table 5). The less extreme changes dampen the decline in demand for urban formal labor in those sectors. Likewise, output for those sectors declines less than when there are no unions because of the decline in the cost of urban formal workers.

Table 5. *Effects of Trade Liberalization in Bangladesh under Alternative Specifications of the Labor Market for Unionized Sectors*

Sector	Exogenous wage differentials (no unions)	Active union		
		No concessions	Low concessions	High concessions
<i>Wage differential for urban formal workers (percentage change from base level)</i>				
Cotton yarn	0.00	7.23	-1.42	-9.48
Paper	0.00	-2.43	-8.26	-13.59
Leather	0.00	15.24	5.00	-4.71
Fertilizers	0.00	2.73	-8.68	-19.10
Cement	0.00	-4.67	-12.75	-20.37
Basic metals	0.00	-5.49	-16.40	-6.51
Metal products	0.00	-2.87	-10.66	-18.00
Petroleum	0.00	3.05	-4.65	-11.95
Electricity and gas	0.00	-3.99	-10.86	-16.97
<i>Demand for urban formal labor (percentage change from base level)</i>				
Cotton yarn	12.28	7.18	11.32	16.11
Paper	-5.11	-3.82	-1.04	1.96
Leather	30.82	15.53	22.27	30.43
Fertilizers	5.55	3.44	10.86	19.44
Cement	-11.31	-8.73	-4.32	0.63
Basic metals	-12.19	-9.70	-2.88	-10.83
Metal products	-7.64	-6.09	-1.90	2.99
Petroleum	4.43	2.36	6.50	11.21
Electricity and gas	-7.48	-5.71	-3.69	-1.57
<i>Output (percentage change from base level)</i>				
Cotton yarn	6.56	6.02	6.03	6.15
Paper	-0.76	-0.52	-0.03	0.50
Leather	32.75	28.47	29.21	30.36
Fertilizers	8.16	7.90	9.60	11.48
Cement	-7.71	-6.79	-5.27	-3.72
Basic metals	-6.70	-6.25	-5.30	-6.11
Metal products	-5.40	-4.69	-2.90	-1.02
Petroleum	7.77	7.12	8.59	10.17
Electricity and gas	-3.75	-3.53	-3.60	-3.60

Source: Authors' calculations.

When the active union makes wage concessions in conjunction with trade liberalization, jobs are saved in the unionized sector, but workers receive a lower wage. Consider the scenario with high concessions. The number of featherbedders declines dramatically (63.8 percent, see table 4), increasing the labor supply. The real return to urban formal workers declines 5.9 percent because of both loss of the union premium and increase in the supply of productive workers. The spillover effects favor the other labor groups. As output expands in response to the increase in the supply of urban formal workers (because of the reduction in featherbedders), the demand for other inputs increases as well. The real return to rural workers increases 6.5 percent, and the real return to urban informal workers increases 3.2 percent. Both are slightly better off than when there is trade liberalization with no unions.

To report the sensitivity of our results to the bargaining concessions, we consider the case in which the union makes low, rather than high, concessions. In this case, the pattern of wage change is the same, but the magnitude is smaller. Likewise, the number of featherbedders declines, but by a smaller amount (33.9 percent rather than 63.8 percent).

The sectoral effects of trade liberalization for the case with active unions and high concessions are more dramatic. The wage differential for cement and metal products declines 20.4 and 18.0 percent, respectively (table 5). The change in factor cost reverses the change in factor demand—there is an increase in the demand for urban formal workers in these sectors, compared with the decrease in demand in the model with no unions. However, the change in factor cost, coupled with the dramatic increase in productive labor as the number of featherbedders declines 63.8 percent (table 4), is not enough to reverse the change in output observed with trade liberalization. Output in cement, for example, declines 3.7 percent rather than 7.7 percent when there are no unions; likewise, output in metal products declines 1.0 percent rather than 5.4 percent.

Wage changes by sector reflect the loss of the union premium. For example, urban formal workers employed in the nonunion sectors experience a real wage increase of 2.3 percent (table 4). This real wage increase accrues to urban formal workers who do not change jobs. Those who change sectors may receive a different sectoral wage differential, changing the real wage received. However, those in the union sector experience a wage change that accounts for changes in the union premium, which declines in most unionized sectors. This decline in the wage premium means that the real average return to unionized labor declines 5.9 percent.

Given the structure of protection and intermediate demands, certain unionized sectors expand following trade liberalization (table 5). For example, leather production increases 32.8 percent following trade liberalization in a model with no unions. This reflects an increase in the demand for leather as an intermediate good in production. In the case with active unions and no bargaining concessions, the wage differential increases 15.2 percent because of the increase in

demand for leather as an intermediate good. This cost increase does dampen the increase in output, which rises only 28.5 percent in this case.

When high bargaining concessions accompany trade liberalization, the union premium declines for all sectors (table 5). In general, output increases (or does not decline as much) in this scenario, compared to the model with trade liberalization and no unions.

What does all of this imply for the benefits to be gained from trade liberalization in Bangladesh? The existence of active unions, which refuse to make bargaining concessions, does not seem to have much of an effect on welfare gains. Equivalent variation is 20.1 for the cases of trade liberalization both with exogenous price differentials and with active unions and no concessions (table 4). This result, different from that derived from the stylized model, is explained by the fact that some unionized sectors, such as leather, expand following trade liberalization. The wage differential in these sectors increases as well, offsetting the welfare gains that accrue when other unionized sectors contract.

In the more likely case that liberalization pushes the unions into making bargaining concessions, the gains from trade are higher. In this case the bigger fall in the union premium and the huge decline in the number of featherbedders more than offset any losses due to the unionization of export sectors.

III. INDONESIA

In contrast to Bangladesh, Indonesia opted early on for less interventionist policies and an open trade regime, with excellent results. Real per capita GDP growth over the last fifteen years (1979–94) has averaged more than 4 percent a year. Exports of manufactured goods have been rising at more than 30 percent a year. Workers have reaped tremendous benefits from this growth. Formal sector jobs, which offer higher wages and greater job security, are being created at faster rates than ever before, much faster than in most other countries. Wage employment has been increasing at more than 4.5 percent a year, while real earnings have been rising at 9 to 10 percent a year.

Yet, in the 1990s labor unrest has increased. During 1989–92, the number of strikes rose thirteenfold from 19 to 251 and the number of working hours lost because of strikes rose from about 29,000 to more than 1 million. The fact that many of these strikes occurred in export-oriented enterprises close to Jakarta has drawn international and domestic public attention. Many observers, for example Agrawal (1995), attribute the spread of labor unrest to the failure of the officially sanctioned trade union movement to represent workers' rights and to negotiate better working conditions.

Indonesia is now under internal and external pressure to liberalize its labor regulations and ease restrictions on unions. Although Indonesian law clearly guarantees the right to form unions, difficulties arise in practice. There is only one legally recognized union in the private sector (the SPST), which is closely linked to the government. Government decrees essentially prevent the forma-

tion of other independent unions that can represent workers in collective bargaining. Although workers can form worker organizations or company-level unions, only a registered union can bargain collectively with employers. The conditions for registration are very restrictive. As Freeman (1993) states in the context of other East Asian countries, "The seemingly innocuous procedure for registering trade unions is a powerful tool for repression."

Instead of liberalizing labor regulations, the government has tried to achieve industrial peace by increasing mandated benefits, especially minimum wages. What are the efficiency effects of mandating minimum wages compared with allowing unions greater independence?

Model Description

To answer this question, we consider the effect of a policy shock that reduces the demand for urban formal workers in Indonesia under three assumptions about the structure of the labor market: completely free labor markets where wage differentials are exogenous, labor markets where government sets a binding minimum wage, and labor markets where unions are allowed greater independence. We use Lewis's (1991) CGE model of Indonesia and modify the labor market structure. Because tariffs are quite low in Indonesia and do not protect sectors in which unions are likely to form, we choose a policy shock that is different from the one used in the Bangladesh model: a 20 percent reduction in government spending.

The Indonesia model has thirty sectors. We treat seventeen of the sectors that currently use formal labor relatively intensively as potentially unionized sectors to illustrate the rigidities that union behavior may introduce when there are economic reforms. These sectors account for 54 percent of the urban formal labor force. There are six factors of production: agricultural labor, rural labor, urban informal labor, urban formal labor, capital, and land. As in the Bangladesh model, all sectors use intermediate goods.

As we did in the case of Bangladesh, we compare the impact of an exogenous shock in a model with and without unions. In addition, we carry out simulations on a model with a minimum wage in order to see the impact of present policies. In the case with a minimum wage paid to urban formal workers, urban formal workers who become unemployed move into the urban informal sector, putting downward pressure on wages for workers in that sector. Unions, in contrast, provide high wages only for a portion of urban formal workers; urban formal workers who lose their job in a unionized sector remain in the urban formal labor market in another sector. Spillover effects to the other types of labor occur only through substitution in production.

Simulation Results

We consider a 20 percent decline in government spending. The purpose of the experiment is to change the composition of spending and therefore reduce the demand for commodities produced by unionized sectors. The government spends

about 85 percent of its income on services, which constitutes a unionized sector. With a 20 percent reduction in government spending, government savings and therefore total savings increase. Because savings equal investment, the increase in savings means an increase in investment spending. Some investment spending also increases the demand for output of the unionized sectors, but the net effect is a decline in demand for urban formal workers.

In the case with exogenous wage differentials (no unions), the real average wage for urban formal workers declines 3.1 percent (see table 6) because the government purchases services, a good that uses urban formal labor intensively. The share of value added accruing to urban formal workers in the service sector is 33 percent (see table 7). The real average wage decline is caused by both a decline in the demand for urban formal labor and the movement of these work-

Table 6. *Macroeconomic Effects of a 20 Percent Reduction in Government Spending in Indonesia under Alternative Specifications of the Labor Market*

Item	Exogenous wage differential (no unions)	Minimum wage ^a	Active union	Passive union	
				$\mu = 0.35$	$\mu = 0.8$
<i>Real market-clearing factor return</i> (percentage change from base level)					
Agricultural labor	-0.67	-0.57	-0.76	-0.72	-0.80
Rural	0.27	0.22	0.30	0.25	0.24
Urban informal	0.40	-3.28	0.45	0.36	0.32
Urban formal	-2.84	0.00	-2.40	-2.02	0.07
Capital	0.00	0.00	0.00	0.00	0.00
<i>Real average factor return</i> (percentage change from base level)					
Agricultural labor	-0.59	-0.49	-0.67	-0.63	-0.71
Rural	-0.14	-0.12	-0.19	-0.18	-0.20
Urban informal	1.90	-1.42	1.93	1.88	1.90
Urban formal	-3.10	0.66	-3.33	-3.16	-3.27
Capital	0.49	0.45	0.48	0.47	0.48
Featherbedders	0.00	0.00	-2.41	0.00	0.00
Total exports	0.07	0.01	0.02	0.01	-0.06
Total imports	0.28	0.31	0.23	0.21	0.14
<i>Unemployment</i> (share of urban formal labor supply)					
	0.00	0.05	0.00	0.00	0.00
<i>Equivalent variation^b</i>	38.1	23.15	38.01	38.92	44.60

a. There is comparable labor coverage—the number of urban formal workers affected by the policy shock—in the minimum wage and the various union scenarios.

b. Measured in units of the numeraire good. Equivalent variation is a weighted average over households, and a positive number indicates a welfare gain.

Source: Authors' calculations.

Table 7. *The Structure of Indonesia's Economy for Selected Sectors*

<i>Sector</i>	<i>Tariff</i>	<i>Share of output</i>	<i>Share of urban formal employment by sector</i>	<i>Share of sectoral value added paid to urban formal workers</i>
Chemicals	0.04	0.02	0.01	0.12
Machines	0.06	0.04	0.01	0.08
Construction	0.00	0.12	0.01	0.05
Trade	0.00	0.09	0.42	0.31
Transportation	0.00	0.05	0.02	0.08
Services	0.00	0.17	0.50	0.33

Source: Authors' calculations.

ers out of sectors that pay them a high wage differential. The real return to urban informal workers increases 1.9 percent (table 6).

In contrast, in the case with a minimum wage for urban formal workers, producers respond to the decline in demand by shedding labor. These workers move into the urban informal labor market where the real average wage declines 1.4 percent (table 6). The real average return to urban formal workers increases slightly, reflecting sectoral changes among them.

The presence of an active union forces the adjustment on urban formal rather than informal workers. Furthermore, the adjustment costs have more impact on unionized urban formal workers who lose their wage markup. The nonunionized urban formal workers who do not change sectors, in fact, are slightly better off because the wages paid to urban formal workers in nonunion sectors decline 2.4 percent rather than 2.8 percent in the case of exogenous wage differentials (table 6). The real return to urban formal workers, accounting for the decline in the wage premium and the reallocation of labor to sectors that pay different wage differentials, declines 3.3 percent in the case with active unions compared with 3.1 percent in the case with exogenous wage differentials. The larger decline in the case with active unions is caused by the loss of the union premium. Both demand and supply changes in the labor market affect the wage for urban formal workers. The labor supply increases because the number of featherbedders declines 2.4 percent. However, the demand for labor increases as the union wage premium decreases in certain sectors, such as services, which employs a large share of urban formal labor. The labor demand shift dominates, and the market-clearing wage declines less than in the model with exogenous wage differentials.

In the case with passive unions in Indonesia, the adjustment is also forced on urban formal workers whose real average return declines 3.2 percent when the union puts a low weight on wages and 3.3 percent when it puts a high weight on wages (table 6). The real average return to urban informal workers increases 1.9 percent for either specification of preferences. In all union sectors there is a positive relationship between the demand for urban formal labor and the wage differential (see table 8). When the union places a low weight on wages, the

results are quite similar to those in the model with exogenous wage differentials. When the union places a high weight on wages, there is a bigger change in the wage premium and a smaller change in employment, compared with the low-weight case. As a result, output generally declines more or increases less than when the union puts a low weight on wages.

Construction, a sector that expands as investment demand increases, illustrates the effect that different union preferences have on wages. When the union cares about wages—the high-weight case—the wage differential increases 11.3 percent as the sector expands (table 8). In contrast, when the union cares about employment—the low-weight case—the wage differential only increases 0.9 percent. Instead, employment increases 12.3 percent, as opposed to 1.1 percent in the high-weight case.

How do the different labor market specifications affect the welfare gains caused by the change in policy? The welfare gain is lowest in the case with a binding minimum wage, which has an equivalent variation of 23.2 (table 6). This reflects the fact that the binding minimum wage prevents the down-

Table 8. *Selected Sectoral Effects of a 20 Percent Reduction in Government Spending in Indonesia under Alternative Specifications of the Labor Market*

Sector	Exogenous wage differential (no unions)	Minimum wage ^a	Active union	Passive union	
				$\mu = 0.35$	$\mu = 0.8$
<i>Wage differential</i> (percentage change from base level)					
Chemicals	0.00	0.00	1.26	0.16	-0.60
Machines	0.00	0.00	5.33	2.73	6.32
Construction	0.00	0.00	8.07	0.88	11.30
Transportation	0.00	0.00	1.19	0.55	-0.28
Services	0.00	0.00	-1.91	-2.01	-6.55
<i>Demand for urban formal workers</i> (percentage change from base level)					
Chemicals	2.08	-0.49	0.57	1.19	-0.07
Machines	9.47	6.44	4.35	6.13	1.06
Construction	13.97	10.48	6.39	12.26	1.14
Transportation	2.39	-0.39	0.87	1.11	-0.05
Services	-4.36	-6.52	-3.27	-3.49	-1.47
<i>Output</i> (percentage change from base level)					
Chemicals	-0.28	-0.19	-0.39	-0.35	-0.50
Machines	3.54	3.59	3.43	3.42	3.18
Construction	7.27	7.27	7.39	7.22	7.07
Transportation	0.06	0.26	-0.04	0.00	-0.04
Services	-4.07	-4.39	-3.87	-3.90	-3.50

a. There is comparable labor coverage—the number of urban formal workers affected by the policy shock—in the minimum wage and the various union scenarios.

Source: Authors' calculations.

ward adjustment in formal wages needed for an efficient reallocation of labor. In contrast, the equivalent variation under the various union specifications, which do allow flexibility in the economy, are all higher, ranging from 38.1 to 44.6. The union effects, compared with the exogenous wage differentials, follow the same pattern as in Bangladesh. In the case with active unions, the welfare analysis is the same as the no-union case because some unionized sectors expand, offsetting the gains as other unionized sectors contract. The case with passive unions and a high weight on wages has the largest welfare gain because the wage differential for services decreases the most. Note that the increase in the wage differential for construction as investment spending increases is dominated by the decline in services as government spending declines.

IV. CONCLUSIONS

In this article, we have evaluated the difference that the presence of labor unions has made to the outcome of economic reform in developing countries. Using a stylized, two-sector model, we have shown that the welfare gains from trade liberalization are amplified when there are unions in the protected sector. The reason is that increased import competition drives down the wage premium that unions enjoy, leading to a more efficient allocation of labor in the economy. Although this is true for both passive and active unions, the effect is much greater for active unions. Trade reform reduces the active unions' ability to protect featherbedders, yielding an additional gain as these surplus workers are absorbed into the productive labor force. Finally, if the threat of import competition prompts active unions to shed featherbedders as part of a contract with management, the welfare gains are astonishingly high.

We have applied the insights from this stylized analysis to two contemporary policy issues. In Bangladesh, where unions are strong, we have shown that further liberalization of international trade would produce a "double dividend"—greater efficiency in both labor and product markets. In Indonesia, where there are restrictions on union operations but trade has been substantially liberalized, we have shown that allowing unions greater freedom is superior to the current minimum-wage policy. This is because the wage markup of unions is still flexible in the face of adverse demand shocks, whereas a minimum wage introduces an additional rigidity in the economy. Unions are also preferable on equity grounds. In the case with a minimum wage, urban informal labor bears the cost of the adjustment. In the case with a union, however, urban formal labor bears the cost of adjustment.

Our work raises a host of political-economy issues that warrant further research. In a country like Bangladesh, unions will probably try to block reforms, such as trade liberalization, which make product markets more competitive. Governments in Indonesia or other East Asian countries may be reluctant to forgo regulation in favor of allowing more freedom to trade unions, which are

often opposed to the regime in power. How to convince vested interests to support globally beneficial policies is perhaps the central question facing developing countries today.

REFERENCES

The word "processed" describes informally reproduced works that may not be commonly available through library systems.

- Agrawal, Nisha. 1995. "Indonesia: Labor Market Policies and International Competitiveness." Policy Research Working Paper 1515. World Bank, Washington, D.C. Processed.
- Bangladesh Bureau of Statistics. 1995. *Report on Labor Force Survey*. Dhaka, Bangladesh.
- Blanchflower, David G., and Richard B. Freeman. 1990. "Going Different Ways: Unionism in the U.S. and Other Advanced OECD Countries." NBER Working Paper 3342. National Bureau of Economic Research, Cambridge, Mass. Processed.
- Dahl, Hendrik, and Pradeep Mitra. 1991. "Applying Tax Policy Models in Country Economic Work: Bangladesh, China, and India." *The World Bank Economic Review* 5(3):553-72.
- de Melo, Jaime, and David Tarr. 1992. *A General Equilibrium Analysis of U.S. Foreign Trade Policy*. Cambridge, Mass.: MIT Press.
- Devarajan, Shantayanan, Hafez Ghanem, and Karen Thierfelder. 1995. "Labor Market Regulation, Trade Liberalization, and the Distribution of Income in Bangladesh." Policy Research Department, World Bank, Washington, D.C. Processed.
- Devarajan, Shantayanan, and Delfin S. Go. Forthcoming. "The Simplest Dynamic General Equilibrium Model of an Open Economy." *Journal of Policy Modeling*.
- Devarajan, Shantayanan, Jeffrey D. Lewis, and Sherman Robinson. Forthcoming. *The General Equilibrium Approach to Adjustment Policy*. Cambridge, U.K.: Cambridge University Press.
- Devarajan, Shantayanan, and Erik Offerdal. 1989. "Capital Markets and General Equilibrium Models: Comparative Statics without Apology." *Journal of Policy Modeling* 11(2):191-212.
- Fields, Gary. 1994. "Changing Labor Market Conditions and Economic Development in Hong Kong, Korea, Singapore, and Taiwan." Department of Economics, Cornell University, Ithaca, N.Y. Processed.
- Freeman, Richard B. 1980. "Unionism and the Dispersion of Wages." *Industrial and Labor Relations Review* 34(1):3-23.
- . 1993. "Does the Suppression of Labor Contribute to Economic Success? Labor Relations and Markets in East Asia." Department of Economics, Harvard University, Cambridge, Mass., and London School of Economics, London. Processed.
- Freeman, Richard B., and James L. Medoff. 1984. *What Do Unions Do?* New York: Basic Books.
- Johnson, George E. 1990. "Work Rules, Featherbedding, and Pareto Optimal Union-Management Bargaining." *Journal of Labor Economics* 8(1, part 2):S237-59.
- Lee, Joungh-Woo, and Sang-Sup Nam. 1994. "The Effect of Labor Unions on the Wage Dispersion in Korea." *Korean Economic Journal* (in Korean) 41(3):251-77.

- Lewis, Jeffrey D. 1991. "A Computable General Equilibrium (CGE) Model of Indonesia." Development Discussion Paper 378. Institute for International Development, Harvard University, Cambridge, Mass. Processed.
- McDonald, Ian M., and Robert M. Solow. 1981. "Wage Bargaining and Employment." *American Economic Review* 71(5):896-908.
- Moll, Peter G. 1993. "Black South African Unions: Relative Wage Effects in International Perspective." *Industrial and Labor Relations Review* 46(2):245-61.
- Panagides, Alexis, and Harry Anthony Patrinos. 1994. "Union-Nonunion Wage Differentials in the Developing World: A Case Study of Mexico." Policy Research Working Paper 1269. Education and Social Policy Department, World Bank, Washington, D.C. Processed.
- Park, Young-Bum. 1991. "Union/Minimum Wage Differentials in the Korean Manufacturing Sector." *International Economic Journal* 5(4):79-91.
- Rahman, Masihur. 1994. "Structural Adjustment, Support, and Workers: Public Issues and Choice for Bangladesh." World Bank, Washington, D.C. Processed.
- Standing, Guy. 1992. "Do Unions Impede or Accelerate Structural Adjustment? Industrial versus Company Unions in an Industrialising Labour Market." *Cambridge Journal of Economics* 16(September):327-54.
- Teal, Francis. 1994. "The Size and Sources of Economic Rents in a Developing Country Manufacturing Labor Market." Center for the Study of African Economics, St. John's College, Oxford University, Oxford. Processed.
- Thierfelder, Karen, and Clinton R. Shiells. 1996. "Trade and Labor Market Behavior in General Equilibrium Models." In Joseph F. Francois and Kenneth A. Reinert, eds., *Applied Methods for Trade Policy Analysis*. Cambridge, U.K.: Cambridge University Press.
- World Bank. 1995. "Bangladesh: Labor Market Policies for Higher Employment." Report 13799-BD. South Asia Country Department I, Washington, D.C. Processed.