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DEPARTMENT OF ECONOMICS

Working Paper

Must Improved Labor Standards Hurt Accumulation in the Targeted Sector? Stylized Analysis of a Developing Economy

by

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Must Improved Labor Standards Hurt Accumulation in the Targeted Sector? Stylized Analysis of a Developing Economy

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Abstract

This paper analyzes a stylized small open economy. The analysis classifies the economy into two tradable output-producing sectors: a manufacturing sector and a (mainly tourism-related) services sector. Assuming sectoral differences based on stylized facts, we explore the impact of higher labor standards in the manufacturing sector on the long-term prospects of the economy using comparative dynamic exercises to analyze changes in output, foreign direct investment, relative prices, sectoral distribution, and accumulation. We find, in particular, that imposing higher standards across the manufacturing sector could, in the long run, shift the structure of the domestic economy *in favor* of that sector.

1 Introduction and Motivation

Debates surrounding the issue of labor standards have acquired a prominent place in economics literature in recent years. The analysis typically focuses on issues of trade, external competitiveness, and short-run effects on foreign direct investment. This paper analyzes a stylized small open economy to explore labor standards-related issues from the perspective of long-run accumulation.

Although this paper is purely theoretical in nature, the structure of the model and some of the stylized assumptions are broadly inspired by the Cambodian economy. Cambodia is currently part of a pioneering effort called the "Better Factories Program" managed by the International Labor Organization (ILO) in collaboration with other international organizations. Under this program, Cambodian apparel exporters are provided an incentive to improve their working conditions by facilitating access to international buyers – who make

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sourcing decisions – in return for demonstrated improvements. What are the likely effects of such a program in the small developing economy context? The answer depends on, among other things, what happens to the rest of the economy such as the services sector, where a similar program would likely be much harder to implement given organizational and monitoring barriers. Insofar as one or the other sector is associated with greater scope for productivity growth, the resulting consequences for the composition of accumulation between manufacturing and services may determine the path of output and productivity growth over the long-run.

Ever since its recovery began in the post-Khmer Rouge period, the Cambodian economy has undergone major structural changes. To take a few indicators, trade has increased as a proportion of GDP from 69 percent in 1996 to 139 percent in 2006. Manufactured exports are now almost 98 percent of total merchandise exports. Moreover, of these, textiles and garments constitute almost three-fourths.[1] Much of the manufactured exports originate from import-intensive, vertically integrated international supply chains where profit margins are thin and most of the value addition takes place outside Cambodia. Input-output analysis of three South East Asian economies, Cambodia, Vietnam, and Thailand by AREES Study Group (2009) suggests that the industrial sector tends to use domestic and imported intermediate inputs much more intensively than services and agriculture. For example, in Cambodia, the intermediate input requirement per unit of gross industrial output is 58 percent compared to 42 percent for the entire economy. Moreover, the merchandise exported (e.g., labor-intensive apparel) is mainly of a nature for which close substitutes are easily available from international markets. Cambodia has also seen its trade in services grow rapidly to a point where it now constitutes almost 30 percent of GDP. International tourism exports alone account for a quarter of total exports of goods and services. Of these, travel and transportation constitute almost 90 percent, according to World Trade Organization (2008).

Cambodia has also experienced a remarkable surge in inflows of foreign direct investment (FDI). Initially a significant proportion of this FDI went into the tourism-related services sector but the manufacturing sector has experienced the lion's share over the past few years. Cuyvers et al. (2008) report that over 1994-2004, 43 percent of realized FDI occurred in the manufacturing sector. The garment sector attracted more than half of this FDI. In recent years the sectoral composition has become more lop-sided in favor of manufacturing, mainly garments. For example, according to Asian Development Bank (2006), the manufacturing share of approved FDI projects was 60 percent in 2005. This FDI has more than offset current account deficits in recent years. For example, according to our calculations based on the World Bank's *World Development Indicators* database, the average FDI to current account ratio was 1.1 over the period 2000-07. The portfolio balance (debt and securities) to current account ratio, on the other hand, was only about 0.04.[2]

[1] Although the garment sub-sector, which is much more labor-intensive than the textile one, heavily dominates.

[2] Official reserve transactions and "errors and omissions" account for the remainder.

These features of the economy, along with the presence of a highly dollarized urban segment existing side by side with a domestic currency (riel)-based "traditional" sector that mainly produces agricultural products and non-tradables, makes Cambodia an interesting economy to analyze in the sense that it encourages us to introduce structural nuances into the traditional small country open economy models. Given the main objective of our analysis, we focus on the tradable goods sector, which, since it competes with the rest of the world, is often seen as the one where the presumed negative consequences of labor standards hit the hardest.[3] We do this by considering a two sector economy in which both sectors produce output that is tradable, although different in crucial respects (see section 2.1 below). We then explore the implications of raising labor standards.

Our results, once the (labor standards-adjusted) profit rates equalize at the new steady-state, depend upon whether the standards are imposed in the foreign- or domestically-owned segment of the manufacturing sector. In the former case, we find that the stock of foreign-owned capital declines over time while that of domestically-owned manufacturing capital relative to that of services capital rises. In the latter case, on the other hand, the stock of foreign capital rises and the composition of domestically-owned capital shifts toward services. Less intuitively, when standards are applied across the *entire* manufacturing sector, the stock of domestically-owned manufacturing capital relative to that of services rises. This result arises from the real depreciation caused by capital outflows that follow higher labor standards, which in turn improves the relative profitability of the manufacturing sector. Thus, our results suggest that contrary to the intense fears expressed by some, higher labor standards need not impact negatively the overall stock of capital in the targeted sector.

Existing literature has devoted substantial attention to trade-labor standard linkages, especially in the context of small open economies (a term that applies essentially to most developing economies barring perhaps a few oil and primary commodity producers).[4] Issues surrounding the role of foreign direct investment and transnational corporations in promoting or undermining labor standards have also generated much energetic debate.[5] Although labor standards impact exports in our model, our main contribution is to analyze the issue of labor standards in a stylized *macroeconomic* framework from the perspective of long-run accumulation, inter-sectoral distribution, and structural change. In doing so, we do not attempt to provide an in-depth analysis of the impact of labor standards in terms of social welfare but focus narrowly instead on the structural evolution of the economy. In particular, we analyze the consequences of higher labor standards in terms of possible effects on the share of

[3] Moreover, the manufacturing sector is where the labor standards are currently being monitored in Cambodia. Another reason for emphasizing the traded sectors is that the "warm glow" effect (Gibson, 2005) for consumers in the industrialized world is an important driver behind world-wide efforts to monitor labor standards. Non-traded goods, by definition, do not make an appearance in the consumption baskets of these consumers.

[4] See, for example, Martin and Maskus (2001) and Maskus (1997). Brown (2000) and Singh (2003) provide comprehensive surveys of related literature.

[5] See, for example, Busse (2002).

foreign- versus domestically-owned capital stocks and of the composition of the domestic capital stock in terms of manufactures versus services.

A significant strand of development literature has emphasized the "special" nature of the manufacturing sector insofar as it is a greater source of learning, scale economies, and dynamic gains from trade.[6] To the extent that this is true, our findings, which are driven in part by plausible assumptions about behavioral differences between domestic and international investors, have interesting implications for the long-run developmental path of the economy.

The next section begins by introducing some of the key features of our model. Section 2.2 then develops the basic framework. Sections 2.3 and 2.4 present the medium-run comparative statics and explore the dynamics of higher labor standards. Finally, Section 3 concludes.

2 The Analytics

2.1 Key Features

Some of the key structural features of our stylized economy include:

- Two tradable output-producing (or simply tradable) sectors, including a manufacturing sector (the M-sector) and a services sector (the S-sector).

[6] See, for example, Cypher and Dietz (2008) for a discussion of the domestic technological learning capacity that arises from exporting manufactures. See also Lall (1998) and Lall (2000) for insightful discussions of the manufacturing export-development nexus in developing countries. In a recent study, Rodrik (2008) hypothesizes that tradable goods (especially manufacturing) suffer disproportionately from the market failures that constitute a binding constraint on low-income country growth. While the positive link between exports and productivity (the so-called "export premium") is well-established empirically, evidence on the direction of causation is more mixed. Exporters may be more productive due to a process of self-selection whereby only the more productive firms begin exporting or it could be due to intense international competition or other factors leading to productivity enhancements under the broad rubric of "learning-by-exporting.". Notice that since the knowledge gained from exporting diffuses quickly across exporters and non-exporters as a result of inter-firm labor mobility and business exchanges, the second channel is likely to be harder to econometrically detect. Nevertheless, in an econometric study of nine African countries, Van Biesebroeck (2005) finds evidence of manufactured exports resulting in productivity growth. The study shows that the presence of scale economies plays an important role in this regard. Credit constraints and contract enforcement issues prevent firms that only produce for the domestic market from fully exploiting this channel. These problems are likely to be more relevant for developing countries, as are the potential gains from imitation. De Loecker (2007) finds in an empirical study of the Slovenian manufacturing sector that export entrants become more productive once they start exporting. Moreover, the productivity gains are higher for firms exporting towards high income regions (i.e., North America and Europe). In a study of British manufacturing firms, Greenaway and Kneller (2007) find that exporting firms experience productivity growth relative to non-exporters. However, the magnitude of divergence across industries appears to be driven by differences in the scope for learning. The export effect is greater, for example, if the distance to the technological frontier is large. Thus, the export effect should generally be larger for low income countries. Among other recent studies, see also Hiep and Ohta (2009) for the case of Vietnamese manufacturing firms, Mahadevan (2007) for Malaysia, and Ogunleye and Ayeni (2008) for Nigeria. Aw et al. (2000), on the other hand, find little evidence for the learning-by-exporting hypothesis for Taiwan or Korea. See Wagner (2007) for a comprehensive survey of studies of the learning-by-exporting channel.

- To reflect Cambodia's dollarization, all prices are expressed in terms of the international currency. Moreover, the excessive degree of dollarization suggests that monetary policy-related features can be abstracted away from without much loss.

- Infinitely elastic international demand for manufactures (the small open economy assumption) and a downward-sloping demand curve for exports of services. The former assumption reflects the hypothesis that, in the long run, there is no reason why the demand for a good should depend significantly on the country of origin, especially if the good is a relatively less sophisticated product that is produced for vertical supply chains and can rather easily be produced to the same specifications in many countries. The latter assumption reflects the brand product nature of Cambodia's tourism offerings, and the reluctance of tourists at the margin to change their travel destination in response to relative price changes.[7]

- Compositional adjustment between exports and domestic consumption in the M-sector and relative price adjustment in the S-sector.

- Manufactures use imported intermediate inputs. This reflects the fact that, as noted in section 1, Cambodian exports are largely vertically integrated into international production networks.

- Manufactured exports are characterized by learning-by-doing, knowledge spillovers, and productivity enhancements due to intense international competition. A simple way to capture this is to assume that labor productivity in the manufacturing sector is a positive function of exports in the medium and long runs.

- Domestic demand for manufactures originates both from workers and domestic capitalists, while demand for tradable services originates in addition from foreign capitalists. Also, domestic residents spend most of their income on manufactures. These simplifying assumptions originate in the fact that almost 90 percent of *exportable* services in Cambodia consist of hotels and restaurants and tourism-related services, which are not likely, on average, to constitute a large part of domestic expenditure.

- FDI (which is the only form of foreign capital in the economy) flows into the manufacturing sector. Although Cambodia attracts FDI in the services sector, as discussed in section 1, the largest inflows in recent years have been to the industrial sector. We, therefore, ignore services FDI for the sake of simplification.

- Labor and capital are perfectly mobile between the sectors. Moreover,

[7] In other words, the historical heritage and tourist attractions present in one country are not perfect substitutes for those on offer by another.

an open capital account means that capital is also mobile internationally.[8] Given the widespread presence of un- and under-employment, we assume constant nominal wages (and hence constant real wages in terms of the main consumption good).[9]

- For simplicity, the non-tradable sector and the government are ignored.[10] This allows us to focus on the sectors of direct interest.

2.2 Basic Framework

In light of the features described in the previous sub-section, we can write down several identities and behavioral specifications. In the following sections, the subscript i refers to sectors ($i = M,\ S$) and the subscript j to domestic and foreign ownership ($j = d,\ f$).

Price Identities

The per unit price of manufacturing and services output, P^* and P_S, respectively, can be expressed as follows:

$$P^* = Wa_M + \frac{P^* r_M}{\upsilon_M} + P^* b \tag{1}$$

$$P_S = Wa_S + \frac{r_S P^*}{\upsilon_S} \tag{2}$$

where P^* = the (dollar) price of all domestically manufactured and imported (intermediate or capital) goods, W = the nominal wage in dollars, a_i = the unit labor coefficient (i.e., the amount of labor required to produce one unit of output), b = the unit intermediate input requirement for the M-sector, and r_i= the sectoral profit rate (per unit of capital stock). Finally, $\upsilon_i = Q_i/K_i$ is the rate of capacity utilization, where K_i and Q_i denote total sectoral capital stocks and outputs, respectively. Table 1 provides summarized definitions of the variables. Given the long-run nature of our model we assume full (or constant) capacity utilization in both sectors so that $\upsilon_i = \upsilon_{i,\max}$. A simple way to capture learning-by-doing effects and knowledge spillovers arising out of manufactured exports to the rest of the world, is to specify labor productivity as a function of the total volume of these exports, X_M.

$$a_M = a_M(X_M);\ a_M^{'} < 0 \tag{1a}$$

[8] Although domestic assets are not necessarily perfect substitutes for international assets. We ignore the risk premium that is likely associated with Cambodian assets. An exogenous risk premium will not qualitatively affect our results.

[9] However, as we see below, the distributional *shares* are not constant. Also, workers who can find a job in the manufacturing sector will presumably prefer to work there due to the presence of labor standards and better amenities in the urban industrial areas. The capital stock in each sector, however, acts as a constraint on employment.

[10] The latter assumption is a reflection of the stylized fact that a major proportion of government spending typically falls on non-tradables such as administration and infrastructure.

Quantitative Identities

Let C_i and X_i represent, respectively, the consumption and exports of the associated good. Then,

$$X_M = Q_M - C_M \tag{3}$$

$$Q_S = C_S + X_S \tag{4}$$

Equation (3) reflects the infinitely elastic nature of international demand for Cambodia's manufactures.

Profit Rates

The profit rate per unit of capital stock in manufacturing can be derived from equation (1).

$$r_M = \pi_M \upsilon_M \tag{5}$$

where π_M $(= 1 - b - wa_M)$ is the profit share of manufacturing output while w $(= W/P^*)$ is the real wage in terms of the workers' main consumption good (or the real consumption wage). Similarly, using p_S $(= P_S/P^*)$ to denote the price of services relative to that of manufactures, and π_S $(= 1 - wa_S/p_S)$ to denote the profit share of services output, yields,

$$r_S = p_S \pi_S \upsilon_S \tag{6}$$

Since P^* is given, p_S is also a measure of the real exchange rate so that an increase in p_S corresponds to a real appreciation.[11]

Consumption spending

Workers and domestic capitalists spend on manufactures and (lodging, transportation, and other tourism-related) services in constant proportions. In addition, foreign capitalists investing in the country also consume services. Using R_d, R_f, and N to denote total domestic profits, foreign profits, and employment, respectively, total nominal expenditures on the two goods can be written

$$P^* C_M = \alpha[(1-s)R_d + WN] \tag{7}$$

$$P_S C_S = (1-\alpha)[(1-s)R_d + (1-\gamma)R_f + WN] \tag{8}$$

where α is the proportion of unsaved domestic income spent on the consumption of manufactures, s represents the domestic savings rate out of profits, and γ is the proportion of foreign profits repatriated. Given the nature of the services sector α is likely to be quite high.

[11] Put differently, if the aggregate domestic price level P is defined as a weighted function of output prices, so that $P = (P^*)^\alpha P_S^{1-\alpha}$, then the domestic aggregate price level relative to the foreign price level is given by $(P^*)^\alpha P_S^{1-\alpha}/P^* = p_S^{1-\alpha}$.

Exports

Equation (3) determines manufactured exports. A simple export demand function for services can be specified as follows:

$$X_S = (1-\alpha^*)\frac{Z^*}{p_S};\ \alpha^{*'}(p_S) > 0 \tag{9}$$

where Z^* is a real measure of world expenditures and $1-\alpha^*$ is the proportion of world expenditures that is devoted to domestic services.

Investment

Ignore capital depreciation and let g_{ji} denote capital accumulation by the different groups of capitalists (i.e., $g_{ji} = (dK_{ji}/dt)/K_{ji} = \dot{K}_{ji}/K_{ji} = \hat{K}_{ji}$). Assuming that labor standards impose a burden on capitalists in the sectors that these are applied in, we specify the sectoral accumulation functions as follows:

$$g_{fM} = \theta_f\left(\Lambda_f r_M - r^*\right) \tag{10}$$

$$g_{dM} = g_{dS} + \theta_d(\Lambda_d r_M - r_S) \tag{11}$$

where Λ_j $(0 < \Lambda_j \leq 1)$ is a labor standards "premium" or an inverse measure of the burden imposed by labor standards on investors, and θ_j captures the sensitivity of investors to inter-sectoral profit rate differentials. In order to provide macroeconomic closure, investment in the services sector is assumed to be the residual left over after investment in the manufacturing sector. Notice that the specification of labor standards in equations (10) and (11) could be interpreted as reflecting "procedural rights" (Singh, 2003), such as the right to accident compensation, the right to free association, rights against arbitrary dismissal, and rights against physical coercion, rather than standards in terms of outcomes such as minimum levels of income or consumption. The former seem to better capture the nature of the labor standards monitoring program in Cambodia.

We are now ready to summarize our set-up with the help of three excess demand equations; one for each sector and one for the macroeconomic (investment-savings or IS) balance.[12] Equations (1)-(11) yield, after normalization by P^*K_{ds}, the following expressions (where $x_M = X_M/K_{ds}$, $k_{ji} = K_{ji}/K_{ds}$, $z^* = Z^*/Kds$, and χ denotes a vector of exogenous variables):

M-Sector: $M(x_M, p_s; \chi) = 0$

$$x_M + \alpha[(1-s\pi_S)p_S\upsilon_S + (1-b-s\pi_M)\upsilon_M k_{dM} + (1-b-\pi_M)\upsilon_M k_{fM}] - \upsilon_M k_M = 0 \tag{12a}$$

[12] The main steps and results are provided in the main text. An available upon request appendix presents greater detail.

S-Sector: $S(x_M, p_s; \chi) = 0$

$$(1-\alpha^*)z^* + (1-\alpha)[(1-s\pi_S)p_S\upsilon_S + (1-b-s\pi_M)\upsilon_M k_{dM} + (1-b-\pi_M)\upsilon_M k_{fM}] + (1-\gamma)\pi_M\upsilon_M k_{fM} - p_S\upsilon_S = 0 \quad (12b)$$

IS: $IS(x_M, p_s; \chi) = 0$

$$g_{dS} - \left[(s-\theta_d\Lambda_d)\pi_M\upsilon_M + \left(\frac{s}{k_{dM}} + \theta_d\right)p_S\pi_S\upsilon_S\right]\frac{k_{dM}}{1+k_{dM}} = 0 \quad (12c)$$

The IS equation incorporates balance of payments equilibrium. The latter condition can be expressed mathematically as:

$$g_{dS} - [x_M + (1-\alpha^*)z^* - b\upsilon_M k_M - (\gamma k_{fM} + \theta_d\Lambda_d k_{dM})\pi_M\upsilon_M + \theta_d p_S\pi_S\upsilon_S k_{dM}]\frac{1}{1+k_{dM}} = 0 \quad (12d)$$

A brief intuitive explanation of equations (12a)-(12c) is in order here. Given an infinite elasticity of world demand for manufactures, exports are simply the difference between domestic production and consumption of manufactures (equation (3)). In other words, demand for manufactures either originates from exports (as captured by the term x_M in equation (12a), or from domestic demand, as captured by the term in the square brackets. The latter term consists of consumption by S-sector workers and capitalists, $(1-s\pi_S)p_S\upsilon_S$, and demand for manufactures by domestic workers and capitalists (net of savings by the latter) as given by the term $(1-b-s\pi_M)\upsilon_M k_{dM} + (1-b-\pi_M)\upsilon_M k_{fM}$. Subtracting manufacturing sector supply, $\upsilon_M k_M$, yields the excess demand condition.

Turning to equation (12b), we know from equation (4) that demand for tradable services originates from external sources, as captured by the terms $(1-\alpha^*)z^*$, and from internal sources. The latter, in turn, consists of demand from domestic agents, represented by $(1-\alpha)$ times the term in the square brackets (which, has already been explained), and from foreign capitalists, $(1-\gamma)\pi_M\upsilon_M k_{fM}$, from which we subtract the output of services to derive the excess demand condition.

Finally, turning to equation (12c), the left hand side consists of the sum of investment net of savings out of M- and S-sector profits, respectively. The assumption that saving is more sensitive to profit income than investment translates into $s > \theta_d$. We can plug in the value of g_{dS} from the balance of payments equation to derive the IS equation in a slightly different form (that explicitly contains x_M):

$$x_M + (1-\alpha^*)z^* - b\upsilon_M k_M - s(\pi_M\upsilon_M k_{dM} + p_S\pi_S\upsilon_S) - \gamma k_{fM}\pi_M\upsilon_M = 0 \quad (12c')$$

Equations (12a), (12b), and (12c') constitute a system of three equations, only two of which are independent. A resort to Walras's Law allows us to solve

a simultaneous system consisting of the zero excess demand condition in the S-sector and the IS (or macroeconomic) balance, in two endogenous variables, x_M and p_S. Since, as explained earlier, the proportion of income spent on tradable services is likely to be low for all the economic agents, we simplify the discussion by consistently assuming from now on that $\gamma \approx \alpha$. The slopes of the two schedules can now be derived.

$$\left.\frac{dp_S}{dx_M}\right|_{SS} = -\frac{S_{x_M}}{S_{p_S}} = \frac{[(1-\alpha)sk_{dM} + (\gamma-\alpha)k_{fM}]wa'_M\upsilon_M}{\alpha^{*\prime}z^* + [1-(1-\alpha)(1-s)]\upsilon_S} < 0$$

An increase in their relative price creates an excess supply of services due both to substitution by foreign consumers and because domestic demand for services declines. A decline in the volume of manufactured exports is required to remove the excess supply through income re-distribution away from capitalists (i.e., the savers) in the manufacturing sector.[13]

$$\left.\frac{dp_S}{dx_M}\right|_{IS} = -\frac{IS_{x_M}}{IS_{p_S}} = \frac{1 + (sk_{dM} + \gamma k_{fM})wa'_M\upsilon_M}{\alpha^{*\prime}z^* + s\upsilon_S} < 0$$

The sign of the numerator may at first seem ambiguous since the first term is positive while the second term is negative. However, differentiating both sides of the BP condition, i.e., equation (12d), with respect to x_M yields the result that $1+(\theta_d\Lambda_d k_{dM}+\gamma k_{fM})wa'_M\upsilon_M = 0$. In other words, an increase in manufactured exports at a given level of output must be offset by an increase in investment and remittances of the magnitude $(\theta_d\Lambda_d k_{dM}+\gamma k_{fM})wa'_M\upsilon_M$. This occurs through income re-distribution toward profits. Plugging this condition back into the numerator of the slope expression yields the expression $(s-\theta_d\Lambda_d)wa'_M\upsilon_M$. This expression is negative since $s - \theta_d\Lambda_d > 0$.

Intuitively, an increase in exports generates higher manufacturing sector labor productivity, which creates excess savings as a result of re-distribution of income towards profits. The relative price of services must decline in order to lower the profit rate, and hence savings, in that sector.

The Jacobian of the system is negative if,

$$S_{x_M}IS_{p_S} < IS_{x_M}S_{p_S}$$

which reduces to:

$$-\{(\gamma-\alpha)(\alpha^{*\prime}z^* + s\upsilon_S)k_{fM} - (\alpha s - \theta_d\Lambda_d)\alpha^{*\prime}z^*k_{dM} - [\alpha(s-\theta_d\Lambda_d) - (1-\alpha)s\theta_d\Lambda_d]\upsilon_S k_{dM}\}wa'_M\upsilon_M < 0$$

This condition is likely to be satisfied as long as the effect of income redistribution from capitalists to workers on demand for services, as captured by the partial derivative S_{x_M}, is relatively weak. Since $\gamma \approx \alpha$, and tradable services

[13] The income redistribution away from capitalists in the manufacturing sector means that foreign and domestic capitalists' demand for services declines while demand originating from workers rises. Since workers do not save, the overall result is greater demand for services.

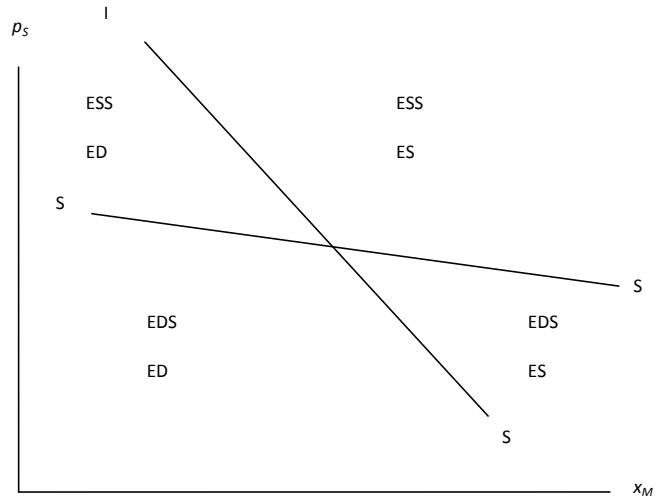

Figure 1: The comparative static set-up. EDS (ESS) denotes excess demand for (supply of) services. ED (ES) denotes excess macroeconomic demand (supply).

are likely to be a small proportion of total expenditures (i.e., α is likely to be high), we assume this condition to be satisfied. Graphically this means that the IS curve is steeper than the SS curve in Figure 1.

That the presence of productivity-enhancing effects of manufactured exports plays a crucial role in our model is now apparent. In the absence of such a positive channel the IS and SS curves becomes horizontal. Note that this mechanism is unlikely to be significant in the short run. The following comparative static section should, therefore, be interpreted as analyzing the medium run.

2.3 The Comparative Statics

This sub-section discusses the comparative statics of exogenous changes in capital stocks. Recall that the two capital stock variables K_{fM} and k_{dM} are pre-determined in the medium run.[14] Table 2 summarizes the results.

2.3.1 An increase in the stock of foreign-owned capital

Mathematically,

$$S_{K_{fM}} = \frac{[(1-\alpha)(1-b) - (\gamma-\alpha)\pi_M]\upsilon_M}{K_{dS}} > 0$$

[14] Note that the absolute rather than relative level of the foreign capital stock is specified here since, as we will see later in section 2.4, one of the closures to our dynamic system specifies a balanced current account in the long run steady state, i.e., $\hat{K}_{fM} = 0$.

$$IS_{K_{fM}} = -\frac{(b+\gamma\pi_M)\upsilon_M}{K_{dS}} < 0$$

An increase in K_{fM} has the direct effect on the S-sector of creating excess demand through greater demand for services by capitalists and workers in the foreign-owned sector, which in turn exerts upward pressure on the real exchange rate. Since π_S rises as a result, the indirect effect of this real appreciation is to create excess macroeconomic supply (and hence to lower x_M) due to higher net savings by service sector capitalists. An increase in K_{fM} has the direct effect on the IS balance of creating excess supply due to greater intermediate imports and remittances. Manufactured exports therefore decline both due to direct and indirect effects. The resulting re-distribution away from capitalists (i.e., the savers) raises demand for services and puts upward pressure on p_s. Thus, x_M is unambiguously lower and p_s unambiguously higher at the new equilibrium.

Figure 2 illustrates the comparative statics. An increase in K_{fM} causes the SS schedule to shift up and to the right and the IS schedule down and to the left. Notice that the real appreciation following an increase in the foreign-held capital stock is consistent with the trends in real exchange rates often seen during periods of heavy foreign capital inflows.

2.3.2 An increase in domestically-owned manufacturing capital

Mathematically,

$$S_{k_{dM}} = (1-\alpha)(1-b-s\pi_M)\upsilon_M > 0$$

$$IS_{k_{sM}} = -(b+s\pi_M)\upsilon_M < 0$$

An increase in k_{dM} has the direct effect on the S-sector of creating excess demand through greater demand for services by capitalists and workers in the domestically-owned sector, which in turn exerts upward pressure on the real exchange rate. Higher service sector capitalist income as a result translates into excess savings, putting downward pressure on x_M. The direct effect of an increase in k_{dM} on the IS balance is that of generating excess supply as domestic savings and intermediate imports rise. The resulting decline in x_M generates an excess demand for services as income is re-distributed towards the non-savers. Thus, again x_M is unambiguously lower and p_s unambiguously higher at the new equilibrium. The shifts of the curves are qualitatively similar to those shown in Figure 2. To the extent that richer countries tend to be capital abundant, the comparative static result is consistent with the well-known Balassa-Samuelson effect that postulates a positive relationship between the real exchange rate and the level of income of a country.

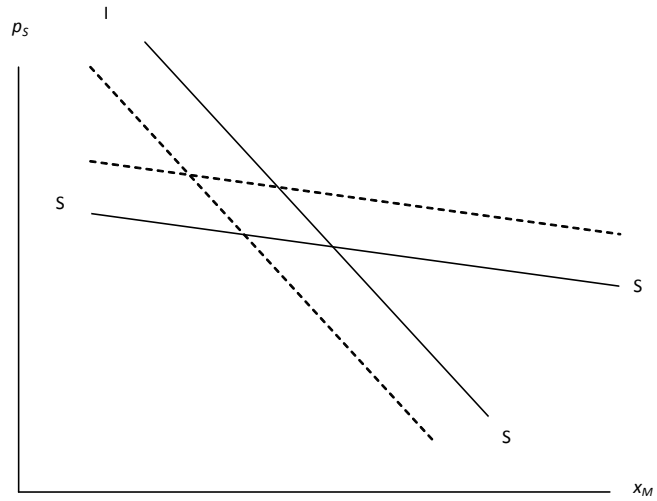

Figure 2: The comparative statics of an increase in K_{fM}.

2.4 The Comparative Dynamics of Labor Standards, Accumulation, and Sectoral Distribution of Resources

Let us turn next to the long-run effects of an increase in labor standards in manufacturing, considering, separately and together, the improvement of such standards in the foreign- and domestically-owned segments of the manufacturing sector. Our closures are derived from the assumptions that in the long-run steady-state: (i) the economy generates adequate resources to finance all its investment needs, that is, the current account is balanced, and (ii) the structure of the economy stabilizes insofar as its composition in terms of manufacturing and services is concerned. Thus, re-writing equations (10) and (11) in a slightly modified form yields our equations of motion:

$$g_{fM} = \hat{K}_{fM} = \theta_f(\Lambda_f r_M - r^*) \tag{10a}$$

$$g_d = \hat{k}_{dM} = \hat{K}_{dM} - \hat{K}_{dS} = g_{dM} - g_{dS} = \theta_d(\Lambda_d r_M - r_S) \tag{11a}$$

where g_d is the rate of accumulation in the manufacturing sector relative to that in the services sector. These specifications have the steady-state properties that, $\Lambda_f \overline{r}_M = r^*$ and $\Lambda_d \overline{r}_M = \overline{r}_S$ so that (labor standards-adjusted) profit rates equalize between sectors.[15]

Equations (10a) and (11a) along with Table 2 enable us to present our system graphically with the help of Figure 3. Note in particular that,

[15] Moreover, when $\Lambda_f = \Lambda_d$, that is, the labor standard premium is uniform across the manufacturing sector, $\bar{r}_S = r^*$.

$$r_M = r_M(\overset{-}{k_{dM}}, \overset{-}{K_{fM}}) \text{ and } r_S = r_S(\overset{+}{k_{dM}}, \overset{+}{K_{fM}})$$

The existence of a locally stable node or focus requires that the $\dot{k}_{dm} = 0$ isocline be steeper than the $\dot{K}_{fM} = 0$ isocline. More specifically, the condition for the Jacobian of the endogenous variables to be positive simplifies, after some manipulation, to what we term condition (A):

$$\frac{\partial r_S/\partial k_{dM}}{\partial r_S/\partial K_{fM}} > \frac{\partial r_M/\partial k_{dM}}{\partial r_M/\partial K_{fM}} \tag{A}$$

In other words, the profit rate in the services sector must be *relatively* more sensitive to changes in the relative capital stock in the domestic manufacturing sector compared to the profit rate in the manufacturing sector. This condition plays a role in the steady-state solutions. Notice that the northwestern and southeastern quadrants in Figure 3 are *traps* (i.e., the system once in these quadrants cannot escape them). This precludes cycles and implies that the stocks of foreign capital and relative domestic manufacturing capital cannot be moving in the same direction as the system approaches steady-state equilibrium.

A preview of the logic underlying our steady-state results can now be presented. Given r^*, equation (10a) determines the steady-state manufacturing profit rate, which is given by $\overline{r}_M = r^*/\Lambda_f$. Given r_M, equation (11a) then determines the steady-state service sector profit rate, $\overline{r}_S = (\Lambda_d/\Lambda_f)r^*$. The transitional dynamics are determined by the evolution of these two profit rates as the capital stocks endogenously evolve over time. Table 3 summarizes the impact effect and the changes in the steady-state values of key variables in response to changes in labor standards.

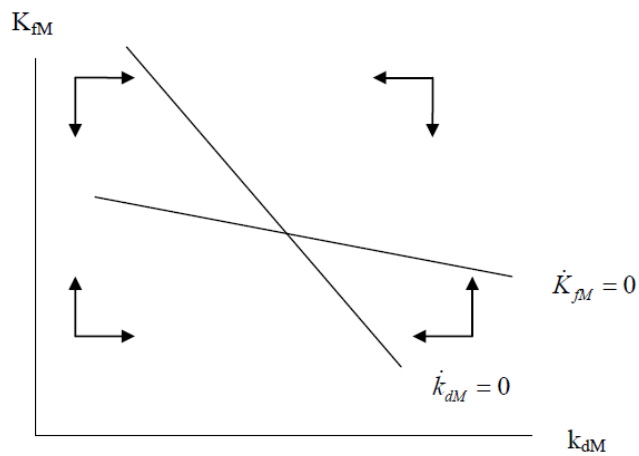

Figure 3: Phase diagram summarizing the model.

2.4.1 Higher labor standards in the foreign-owned sector

First consider the steady state results. It is obvious from equation (10a) that the new steady state is associated with a higher level of r_M $(= r^*/\Lambda_f)$. This must be true since foreign investors now require a higher profit rate to compensate for the increased cost of labor standards. It follows from equation (11a) that, given Λ_d, the steady-state profit rate must also be higher in the services sector. Given our stability condition (A),[16] along with information from Table 2,[17] this is only possible if the stock of foreign capital is lower and that of domestic manufacturing capital higher at the new steady state. Graphically, the $\dot{k}_{dM} = 0$ isocline shifts down and to the left (see Figure 4).[18] Mathematically,

$$\frac{dk_{dM}}{d\Lambda_f} = \frac{\theta_d \theta_f r_M}{\Delta_1}\left(\Lambda_d \frac{\partial r_M}{\partial K_{fM}} - \frac{\partial r_S}{\partial K_{fM}}\right) < 0$$

$$\frac{dK_{fM}}{d\Lambda_f} = -\frac{\theta_d \theta_f r_M}{\Delta_1}\left(\Lambda_d \frac{\partial r_M}{\partial k_{dM}} - \frac{\partial r_S}{\partial k_{dM}}\right) > 0$$

where $\Delta_1 > 0$ is the determinant of the Jacobian. Now consider the transitional dynamics. A decline in Λ_f leads instantly to a lower standards-adjusted profit rate (i.e., $\Lambda_f r_M - r^*$) in the foreign-owned manufacturing sector. Foreign capital outflows follow, which have the effect of dampening the profit rate differential between the sectors (i.e., $r_M - r_S$) as the services sector develops excess supply (due to lower demand from foreign capitalists) while the economy develops excess aggregate demand (due to lower net savings). The resulting real depreciation diverts domestic investment to the (increasingly profitable) manufacturing sector at the same time that the outflow of foreign capital is dampened until the new steady-state equilibrium is reached. The transition to the new steady state involves a monotonic decline in the stock of foreign capital and an increase in the relative stock of domestic manufacturing capital. Thus, interestingly enough, higher standards directed at the foreign-owned manufacturing sector lead to a rise in the stock of domestic manufacturing capital relative to services capital. To the extent that manufacturing is a source of positive externalities, this may be good news, although offset by the fact that lower foreign investment may imply less inward bound technology transfer.

2.4.2 Higher standards in domestically-owned manufacturing

Again, consider first the steady state changes before we turn to the transitional dynamics. It is obvious from equation (10a) that the new steady state is associated with an unchanged level of r_M $(= r^*/\Lambda_f)$. It follows from equation (11a)

[16] Recall that this condition requires that the profit rate in the services sector be *relatively* more sensitive to the relative domestic capital stock in the manufacturing sector compared to the profit rate in the manufacturing sector.

[17] Specifically that, for $\bar{r}_M$ to be higher, at least one of the capital stock variables must be lower, and that for $\bar{r}_S$ to be higher, at least one of the capital stock variables must be higher, at the new steady state.

[18] The appendix provides the mathematical expressions for the shifts of the curves in this and the following two sub-sections.

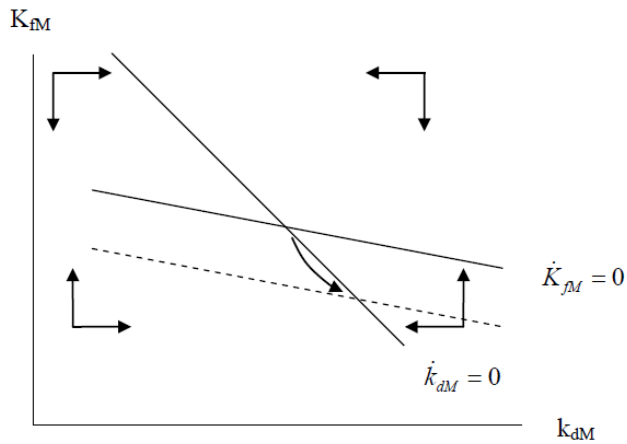

Figure 4: Improved labor standards in the foreign-owned sector.

that, given a decline in Λ_d, the new steady-state profit rate must also be lower in the services sector. Given our stability condition (A), along with information from Table 2, this is only possible if the stock of foreign capital is higher and that of domestic capital lower at the new steady state. Mathematically,

$$\frac{dk_{dM}}{d\Lambda_d} = -\frac{\theta_d \theta_f \Lambda_f r_M}{\Delta_1} \frac{\partial r_M}{\partial K_{fM}} > 0$$

$$\frac{dK_{fM}}{d\Lambda_d} = \frac{\theta_d \theta_f \Lambda_f r_M}{\Delta_1} \frac{\partial r_M}{\partial k_{dM}} < 0$$

A decline in Λ_d leads instantly to a lower (standards-adjusted) profit rate in the domestically-owned manufacturing sector, shifting the $\dot{k}_{dM} = 0$ isocline downwards and to the left (see Figure 4). Domestic investment is diverted towards the services sector, which by raising r_M has the effect of attracting foreign capital inflows. Demand from foreign capitalists creates excess demand in the services sector (and hence a real appreciation) at the same time that the economy develops excess aggregate demand (and hence downward pressure on x_M). The result is a further diversion of domestic investment from the manufacturing to service sectors along with foreign capital inflows until the new steady-state equilibrium is reached. The transition to the new steady state involves a monotonic rise in the stock of foreign capital. Thus, higher standards directed at the domestically-owned manufacturing sector lead to a decline in the stock of domestic manufacturing capital relative to services capital.

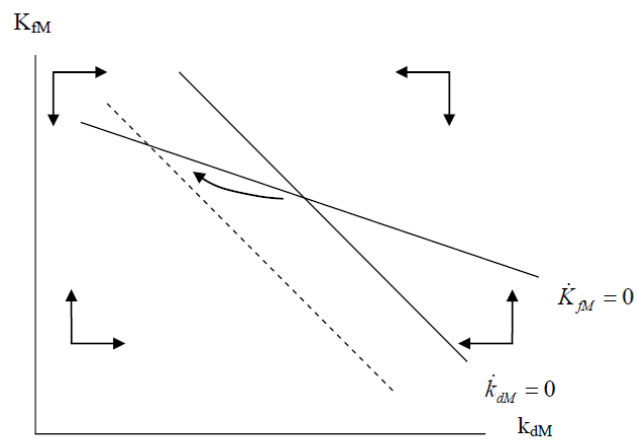

Figure 5: Higher labor standards in domestically-owned manufacturing.

2.4.3 Higher labor standards in the entire manufacturing sector

Finally, consider a scenario whereby the government imposes uniformly higher labor standards in the manufacturing sector regardless of ownership (i.e., $\Delta\Lambda_f = \Delta\Lambda_d = \Delta\Lambda$). The accumulation functions can now be re-written as:

$$g_{fM} = \hat{K}_{fM} = \theta_f(\Lambda r_M - r^*) \tag{10b}$$

$$g_d = \hat{k}_{dM} = \hat{K}_{dM} - \hat{K}_{dS} = g_{dM} - g_{dS} = \theta_d(\Lambda r_M - r_S) \tag{11b}$$

Intuitively, equation (10b) implies that the new steady state is associated with a higher level of $\bar{r}_M$ $(= r^*/\Lambda)$. This must be true since foreign investors now require a higher profit rate to compensate for the increased cost of labor standards. The steady-state profit rate in the services sector, $\overline{r}_S$ $[= (\Lambda_d/\Lambda_f)r^* = r^*]$ in contrast remains unchanged. The initial decrease in the standards-adjusted profit rate in the domestically-owned manufacturing sector creates a profit rate differential in favor of the services sector. At the new steady state, however, both r_S and the adjusted profit rate differential must have returned to their initial values. Given our comparative statics results, as summarized in Table 2, this requires that at least one of the two capital stock variables have a lower value at the new steady state. Given the stability condition (A), this is consistent only with the stock of foreign capital being lower and that of domestic capital higher at the new steady state. Thus, unlike the previous policy experiment where higher labor standards were limited to the domestically-owned manufacturing sector, the dynamic adjustment contin-

ues until r_M has risen beyond and r_S has regained their original steady-state values. Mathematically,

$$\frac{dk_{dM}}{d\Lambda} = -\frac{\theta_d \theta_f r_M}{\Delta_1} \frac{\partial r_S}{\partial K_{fM}} < 0$$

$$\frac{dK_{fM}}{d\Lambda} = \frac{\theta_d \theta_f r_M}{\Delta_1} \frac{\partial r_S}{\partial k_{dM}} > 0$$

Graphically, both the isoclines shift downwards and to the left (see Figure 6). Due to the offsetting effects of changes in capital stocks on r_M and r_S, the $\dot{k}_{dM} = 0$ isocline unambiguously shifts less, both vertically and horizontally, so that while the stock of foreign capital is lower at the new steady state, the relative stock of domestically-owned manufacturing capital is higher. The transition to the new steady state involves overshooting of the relative domestically-owned manufacturing capital stock as it initially declines and then rises beyond its initial level.

Turning to the transitional dynamics, uniformly higher labor standards lead, on impact, to a lower standards-adjusted profit rate in both manufacturing sectors. Foreign capital outflows and diversion of domestic investment towards the services sector follows, creating excess savings and dampening the (negative) profit rate differential between the two domestic sectors. Both the foreign and domestically-owned relative manufacturing capital stocks thus initially decline until the latter arrives at a transitory steady-state value at which the standards-adjusted domestic profit rates are equal, although still lower than the international profit rate. Beyond this point, the result of the continued decline of the foreign-owned stock is to further raise r_M while lowering r_S so that the domestic manufacturing stock builds up until the new steady state is reached.

3 Concluding Remarks

This paper started out by developing a model that incorporates several stylized features of low-income economies. In particular, it introduced a framework that takes into account the varied nature of the Cambodian tradable sector. Our model has two tradable goods-producing sectors: one that produces manufactures as part of a vertically integrated global production network that sells in highly competitive markets and another that sells tourism-related services in the form of a brand-name product. Cambodia is currently part of a much discussed experiment called the "Better Factories program" managed by the International Labor Organization (ILO) in collaboration with other international organizations, under which Cambodian apparel exporters are provided incentives for demonstrated improvements in working conditions for labor. This program, if successful, may become a template for other countries. The major focus throughout the paper was, therefore, to analyze possible consequences of raising labor standards using a relatively simple model.

We explored long-run changes in steady-state sectoral capital stocks in a dynamic framework. Assuming that raising labor standards imposes additional

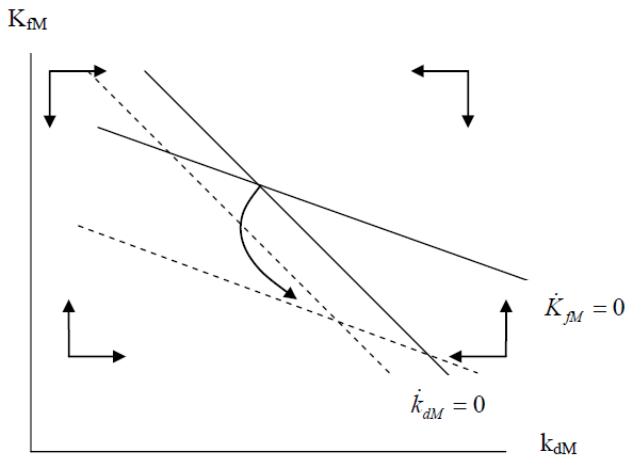

Figure 6: Higher labor standards imposed across the manufacturing sector.

costs on investors which are factored into investment decisions, we considered three cases distinguished by whether the targets are the: (i) foreign investor-owned manufacturing firms, (ii) domestically-owned manufacturing firms, or (iii) the entire manufacturing sector. In the first and last scenarios, the steady-state stock of foreign capital declines while that of domestic manufacturing capital relative to services rises. The former result is perhaps not surprising given that international investors have the option of investing in other countries. The latter result is less intuitive and arises from the (empirically plausible) effect of foreign capital outflows on the real exchange rate and inter-sectoral profit rate differentials. The imposition of higher standards solely on the domestically-owned manufacturing sector shifts the structure of the economy in favor of services but also leads to foreign investment inflows.

We assumed that the manufacturing sector is an international price taker. This means that relative price changes do not directly determine the volume of manufactured exports.[19] Moreover, we assumed the presence of a link between manufactured exports and productivity, which is likely to be significant only over an extended period of time. To the extent that these assumptions are less realistic in the short run, many developing countries' reliance on selling in highly competitive global sectors makes raising labor standards a risky enterprise, unless accompanied by favored access to international markets. If steps are taken to cushion the initial impact, however, the long-run consequences *could* be healthy in terms of shifting domestic resources towards manufacturing.[20]

[19] Although these do indirectly influence manufactured exports by re-distributing income and hence consumption of manufactures in the economy.

[20] Here, however, we must share the reservations of Gibson (2005) who concludes, in a

This finding arises in large part from the assumption that while international investors consider the international profit rate differential, domestic investors are interested in domestic inter-sectoral profit rate differences.

Our theoretical framework abstracts away from several considerations that are likely to be encountered in the real world. Some of these were mentioned in the text. Another obvious one is the fact that foreign and domestic firms typically consider variables such as institutional quality and legal protections, in addition to relative profit rates, while making investment decisions. To the extent that factors such as economies of scale, learning-by-doing, knowledge spillovers, scale economies, and opportunities for technological catch-up tend to exist to a greater extent in the manufacturing sector, however, our analysis does help provide a basis for thinking about interesting issues pertaining to structural evolution and developmental trajectory. Most importantly, it suggests that in a multi-sector framework, the impact of higher labor standards may be much more complicated than would appear to be the case at first glance.

Appendix

Using the implicit function theorem, the shifts of the various curves in Figures 4, 5, and 6 can be mathematically expressed as follows:

$$\left.\frac{\partial k_{dM}}{\partial \Lambda_f}\right|_{\dot{k}_{dM}=0} = 0 = \left.\frac{\partial K_{fM}}{\partial \Lambda_f}\right|_{\dot{k}_{dM}=0} \tag{A.1}$$

$$\left.\frac{\partial k_{dM}}{\partial \Lambda_f}\right|_{\dot{K}_{fM}=0} = -\frac{r_M}{\Lambda_f \frac{\partial r_M}{\partial k_{dM}}} > 0 \tag{A.2}$$

$$\left.\frac{\partial K_{fM}}{\partial \Lambda_f}\right|_{\dot{K}_{fM}=0} = -\frac{r_M}{\Lambda_f \frac{\partial r_M}{\partial K_{fM}}} > 0 \tag{A.3}$$

$$\left.\frac{\partial k_{dM}}{\partial \Lambda_d}\right|_{\dot{k}_{dM}=0} = -\frac{r_M}{\Lambda_d \frac{\partial r_M}{\partial k_{dM}} - \frac{\partial r_S}{\partial k_{dM}}} > 0 \tag{A.4}$$

$$\left.\frac{\partial k_{dM}}{\partial \Lambda_d}\right|_{\dot{K}_{fM}=0} = 0 = \left.\frac{\partial K_{fM}}{\partial \Lambda_d}\right|_{\dot{K}_{fM}=0} \tag{A.5}$$

$$\left.\frac{\partial K_{fM}}{\partial \Lambda_d}\right|_{\dot{k}_{dM}=0} = -\frac{r_M}{\Lambda_d \frac{\partial r_M}{\partial K_{fM}} - \frac{\partial r_S}{\partial K_{fM}}} > 0 \tag{A.6}$$

$$\left.\frac{\partial k_{dM}}{\partial \Lambda}\right|_{\dot{k}_{dM}=0} = -\frac{r_M}{\Lambda \frac{\partial r_M}{\partial k_{dM}} - \frac{\partial r_S}{\partial k_{dM}}} > 0 \tag{A.7}$$

different theoretical setting, that "some pain must be endured before the gains of improved labor conditions can be spread to the rest of the economy," and that the interim difficulties may be hard to accept.

$$\left.\frac{\partial k_{dM}}{\partial \Lambda}\right|_{\dot{K}_{fM}=0} = -\frac{r_M}{\Lambda \frac{\partial r_M}{\partial k_{dM}}} > 0 \tag{A.8}$$

$$\left.\frac{\partial K_{fM}}{\partial \Lambda}\right|_{\dot{k}_{dM}=0} = -\frac{r_M}{\Lambda \frac{\partial r_M}{\partial K_{fM}} - \frac{\partial r_S}{\partial K_{fM}}} > 0 \tag{A.9}$$

$$\left.\frac{\partial K_{fM}}{\partial \Lambda}\right|_{\dot{K}_{fM}=0} = -\frac{r_M}{\Lambda \frac{\partial r_M}{\partial K_{fM}}} > 0 \tag{A.10}$$

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Table 1: Definitions of variables

Variable	Definition (subscript i = M, S and j = f, d)
P_S, P^*	Service sector and international price levels, respectively
p_S	Price of services relative to that of manufactures
W, w	Nominal and real wage, respectively
N	Total employment
a_i	Unit labor coefficients
υ_i	Rate of capacity utilization
b	Intermediate input coefficient in the M-sector
R_j	Total domestic and foreign profits
r_i	Profit rates
X_i	Volume of exports
Q_i	Quantity of output
π_i	Profit share of output
C_i	Consumption of sectoral output
K_{ji}, k_{ji}	Nominal and relative (to K_{ds}) capital stocks. $k_M = \sum k_{jM}$
Z^*	World real expenditure. $z^* = Z^*/K_{ds}$
g_{ji}	Rates of capital accumulation
α, α^*	The shares of domestic and world incomes spent on services
s	Average propensity to save of domestic capitalists
γ	Proportion of foreign profits remitted
θ_j	Sensitivity of accumulation rates to profit rate differentials
Λ_j	Profit rate premium associated with labor standards

Table 2: Comparative Statics

	x_M	p_S	r_M $(= \pi_M \upsilon_M)$	r_S $(= p_S \pi_S \upsilon_S)$
$\uparrow K_{fM}$	$-$	$+$	$-$	$+$
$\uparrow k_{dM}$	$-$	$+$	$-$	$+$

Table 3: Initial Impact and Changes in Steady State Values

	Initial Impact		Steady-State Values			
	$\Lambda_d r_M - r_S$	$\Lambda_f r_M - r^*$	$\bar{r}_M$	$\bar{r}_S$	k_{dM}	$\bar{K}_{fM}$
$\downarrow \Lambda_f$	0	$-$	$+$	$+$	$+$	$-$
$\downarrow \Lambda_d$	$-$	0	0	$-$	$-$	$+$
$\downarrow \Lambda$	$-$	$-$	$+$	0	$+$	$-$