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# The Limits to Wage-Led Growth In a Low-Income Economy

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# DEPARTMENT OF ECONOMICS

## Working Paper

The limits to wage-led growth in a low-income economy

by

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**UNIVERSITY OF MASSACHUSETTS  
AMHERST**

# The limits to wage-led growth in a low-income economy

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## Abstract

Neo-Kaleckian literature has actively debated whether growth is wage- or profit-led in capitalist economies. However, existing studies tend to ignore the non-tradable sector and heterogeneity within the tradable sector. This paper shows that incorporating these features renders wage-led growth in an open developing economy unfeasible in the traditional (Kaleckian) sense of the term. This result – which follows even if one sets aside the competitiveness considerations generally seen as impeding such growth – occurs due to the presence of a homogeneous goods-producing tradable sector that sets the ceiling to steady state growth. A corollary, in light of findings from the “new new trade theory” literature, is that increasing South-South trade may tend to narrow room for wage-led growth regardless of the other desirable effects of higher wages.

JEL classifications: F43, F66, O41, F63, E12

Key words: Wage-led growth, non-tradables, neo-Kaleckian models, development, output heterogeneity.

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# 1 Introduction and Background

Mainstream macroeconomic theory tends to ignore the effects of income distribution on long-run accumulation and growth via aggregate demand. This neglect extends to the domain of open economy issues. Even though trade theory has provided highly useful insights into the microeconomic effects of trade on income distribution, the consequences of distributional changes on long-run growth through the trade channel remain largely unexplored.

Models in the Kaleckian tradition have perhaps most explicitly tackled this question under the rubric of wage-led versus profit-led growth. In a closed economy set-up with mark-up pricing, involuntary unemployment, unutilized capacity, and nominal wage stickiness, a redistribution away from savers (capitalists) and towards spenders (workers) may generate additional spending which boosts capacity utilization by firms. To the extent that investment is a positive function of the profit rate, higher utilization with a fixed profit share boosts accumulation. Thus, growth in a closed demand-driven capitalist economy is wage-led barring a strong profit share effect on desired investment. Blecker (2002) and others have, however, shown that growth is much less likely to be wage-led in an open economy. This is because while redistribution towards workers boosts consumption demand, it simultaneously reduces external demand by making the domestic good less competitive in international markets.

Almost all of the Kaleckian literature pertaining to the debate discussed here ignores the distinction between tradable and non-tradable goods. This is a major gap since the distinction between these two categories is crucial, especially for developing countries where the tradable sector is typically the modern manufacturing sector while the non-tradable sector consists of a number of rural and basic service sub-sectors. Moreover, by working in an “imperfect substitutes” framework, most of this literature has ignored the presence of industries that produce homogeneous, undifferentiated goods. Such industries arguably play an important role in the early stages of economic development.

I endeavor here to contribute towards filling this gap. I start with a simple stylized two-sector dependent economy model of a developing country. Wage-led growth in this model is not possible in the traditional sense of the term owing to the capital constraint in the modern sector and the trade balance constraint on the economy. Any attempt to directly raise the nominal wage in the tradable sector succeeds in raising worker purchasing power but hurts investment and long-run growth.

Next, I develop a three sector model with a non-tradable sector and two tradable sectors: one that produces a high quality differentiated good and another that produces a homogeneous good that has many substitutes in the world market. The structure of the model is designed to replicate aspects of Kaleckian models in order to create room for wage-led growth. Again, directly raising the nominal wage fails to boost growth, which is bound along a steady state balanced growth path by the profit rate in the homogeneous good sector. It may, however, temporarily boost growth in the differentiated goods sector and shift the long-run sectoral composition of the economy towards this sector.

Sustained accumulation and growth consistent with higher worker purchasing power would require a set of policies other than directly raising the nominal wage. In this sense, room for wage-led growth is non-existent.

In sum, this paper contributes to the existing literature in several ways. First, the incorporation of a traditional sector that uses labor and land only highlights the observation that international competition could render wage-led growth unfeasible while still leaving room for raising employment and income through such growth. It also gives rise to other channels outside of traditional neo-Kaleckian ones through which a higher worker share of national output could boost long-run growth. Second, introducing heterogeneity within the tradable sector yields the insight that the presence of a homogeneous goods sector severely constricts the prospects for wage-led growth in a developing economy. This finding, which arises from the fact that such a sector places a ceiling on the rate of accumulation across the entire tradable sector, is very different from the traditional neo-Kaleckian debate about constraints on wage-led growth that revolves around competitiveness issues in an imperfect substitutes framework. Finally, insofar as Southern countries tend to export higher quality differentiated goods to Northern countries while exporting lower-quality, more homogeneous goods to other Southern countries, an implication of our main finding is that increasing South-South trade may narrow room for wage-led growth.

Given the centrality of the homogeneous goods sector to our analysis, a few comments may help place things in context. The assumption of a capital-constrained developing economy is quite standard. However, one could imagine a capital-constrained South where, unlike our framework, the producers are not price takers. Indeed, structuralist models of North-South trade often posit a capital-constrained South and a demand-constrained North.<sup>1</sup> Macroeconomic adjustment in the South typically takes place through terms of trade changes. Such a set-up is more convincing, however, when the South as a whole is being analyzed rather than, as in our case, an individual developing economy that faces close substitutes for its goods produced by other developing economies.

The next section provides a brief overview of the relevant existing literature. Section 3 discusses prospects for wage-led growth in a simple two-sector dependent economy set-up. Section 4 then extends the discussion to a more comprehensive three good set-up. Section 5 discusses other possible implications of the results while section 6 concludes.

## 2 Brief literature review

Debates around the relationship between distribution and growth go back at least to the origins of classical economics. In recent times Kaleckian literature has given serious attention to the macroeconomic linkages between income distribution, demand, accumulation, and economic growth. While most of the post World War II models beginning with Steindl (1952), and including, among

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<sup>1</sup>See, for example, Dutt (2002) and chapter 10 of Taylor (1983).

others, Del Monte (1975), Taylor (1983), and Dutt (1984), had a strong stagnationist tilt, later work explored alternative scenarios. In particular, Marglin and Bhaduri (1988) and Bhaduri and Marglin (1990) raised the possibility of “exhilarationism” with the help of a modified investment function that specified the profit *share* as an argument instead of the profit rate to avoid a strong accelerator effect. An economy, in this scheme of things, can be stagnationist, whereby a redistribution towards wages boosts consumption demand sufficiently to boost aggregate demand and utilization, or it can be exhilarationist, whereby a redistribution reduces investment demand sufficiently to lower aggregate demand and utilization. If the increase in demand following re-distribution is strong enough, utilization rises adequately to dominate the negative direct effect of a lower profit share on investment. Wage-led capital accumulation and growth result. Conversely, growth is profit-led.

Bhaduri and Marglin (1990) also explored the implications of opening up the economy to trade in goods and services using an “imperfect substitutes” framework, i.e., the domestically produced good was assumed to be an imperfect substitute for the foreign-made good. Blecker (1989) investigated this in much more detail by introducing a flexible mark-up factor over average variable costs. Depending on the specification of the mark-up, any increase in the real wage is partially or fully passed through to the export price, making domestic goods less competitive internationally. This counters any positive effects on growth through increased utilization and investment. Thus, if the Marshall-Lerner condition is satisfied, room for stagnationism and wage-led growth narrows.<sup>2</sup> Even an economy that is wage-led in the absence of international trade can therefore turn into a profit-led one if a decline in real wages boosts international demand adequately to offset the fall in domestic absorption.<sup>3</sup>

While the earlier literature took income distribution as exogenously given, several recent contributions have modified this assumption. Using a “conflicting claims” set-up, Blecker (2011) shows that the same open economy could exhibit wage- or profit-led behavior depending on the source of shocks. A change in firm pricing power, for example, will have different implications than a change in labor’s bargaining position. Cassetti (2012) further considers the conditions under which an economy that is wage-led in autarky is transformed into a profit-led one by international trade. He too incorporates a conflicting claims model of inflation, which introduces feedback from growth and employment into the distributive shares to highlight the importance of institutional factors. Although the paper does not impose a balanced trade condition in a fully specified dynamic framework, it does carry out thought experiments which explore the kinds of income policies that would boost growth while maintaining

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<sup>2</sup>It is worthwhile to note here that these results follow in the particular case where an increase in international competitiveness occurs through wage suppression. An alternative form of re-distribution that takes the form of a decline in the mark-up over costs generates different results.

<sup>3</sup>Arnim et al. (2014) show that, even if two large economies are profit-led, the world as a whole is likely to be wage-led. The intuition is straightforward. The world as a whole is a closed economy. Any increase in international competitiveness gained by one economy will be nullified by the corresponding decrease in the other economy.

trade balance. An interesting finding that is reminiscent of Blecker (2011) is that while wage restraint may help a country grow under certain conditions, the same result could be obtained more effectively by restraining mark-ups.

Sasaki et al. (2013) incorporate the effects of wage bargaining in an open economy neo-Kaleckian model with conflicting claims inflation. Employing the familiar imperfect substitutes framework they demonstrate that, in addition to the demand regime, the effects of a change in the bargaining power on aggregate demand depend also on whether it is workers or capitalists that bear the burden of adjustment to international price competition. The domestic demand regime is not sufficient to identify the group whose increased bargaining power would have a positive impact on aggregate demand.

None of the literature cited above has incorporated a non-tradable sector. Much of the economic activity typically takes place in the non-tradable sector, which then influences the real exchange rate. Moreover, much of the tradable sector activity in developing economies involves the production of relatively simple, homogeneous goods with close, if not perfect, substitutes available in international markets. The present paper aims at exploring these issues.

### 3 A simple dependent economy framework

To facilitate reading, Table 1 provides summarized definitions of the key variables employed in the following analysis. Consider a low income economy with deep pockets of underemployment in the rural sector. The output of this sector ( $Y_N$ ) is not traded on international markets due to various barriers such as quality, transportation costs, and lack of infrastructure. Production in this sector requires labor ( $L_N$ ) and a fixed factor (land), and is subject to diminishing returns (as captured by the parameter  $\gamma$ ). Labor gets a constant proportion  $v$  of its marginal contribution that is determined by norms, institutions, etc.<sup>4</sup> The rents are captured by the owners of the fixed factor (i.e., the landlords). Using  $\omega_N$ ,  $R$ , and  $A$  to represent the real wage (in terms of non-tradables), the rent share of output, and a technological constant,

$$Y_N = AL_N^\gamma; \gamma \leq 1 \tag{1}$$

$$\omega_N = v\gamma AL_N^{\gamma-1} \tag{2}$$

$$R = 1 - v\gamma \tag{3}$$

Domestic agents spend a proportion  $\lambda$  of their expenditure on non-tradable goods. Since the two goods are gross substitutes, this proportion is a negative

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<sup>4</sup>It is important to note here that none of the later results regarding steady state accumulation and growth depend on this assumption of diminishing returns, although modifying it will affect real wages and distribution in the non-tradable sector. The product  $v\gamma$  must be less than one to ensure a positive share of rents.

Table 1: Definitions of key variables

Variable	Definition
$K_i, L_i$	Stocks of capital and labor employed in sector $i$ ( $= D, H, N$ )
$TB$	Trade balance normalized by a capital stock
$C_i, Y_i$	Consumption and output of good $i$ , respectively
$I_i$	Investment in sector $i$
$R, v$	Rental and wage shares of output in the non-tradable sector
$\Pi_i$	Profit share of output in sector $i$
$\bar{\omega}_i, r_i$	Real product wage and profit rate in sector $i$ , respectively
$X$	Exports
$z$	World income $Z$ normalized by $K_H$
$u$	The rate of capacity utilization
$k(= K_D/K_H)$	The relative capital stock in the differentiated goods sector
$\tau, s$	The mark-up and saving rates, respectively
$p_i$	Price of good $i$ relative to the price of the $H$ -sector good ( $P_H$ ) in Section 4, and relative to the price of the tradable good in Section 3
$a_i$	Unit labor coefficients in sector $i$
$\lambda$	Share of domestic consumption expenditure devoted to non-tradables
$\psi$	Share of tradable consumption devoted to the differentiated good

function of the price of non-tradables relative to that of tradables, i.e., the real exchange rate,  $p_N$ .

$$\lambda = \lambda(p_N); \lambda' < 0 \quad (4)$$

The tradable sector of the economy uses labor ( $L_T$ ) and an accumulable factor of production (capital),  $K$ . In line with traditional structuralist models for the South, the output of the sector is capital constrained.

$$Y_T = \min \left\{ \frac{L_T}{a}, \frac{K}{b} \right\} \quad (5)$$

where  $a$  and  $b$  are technologically determined constants. The price of the tradable good,  $P_T$ , is internationally given, and wages are characterized by nominal rigidity.<sup>5</sup> In other words, given international terms of trade, the real product wage  $\bar{\omega}_T$  is constant, although flexible prices in the non-tradable sector mean that the real *consumption* wage in both sectors varies over time. In line with standard structuralist literature, capitalists and landlords are assumed to save a constant proportion  $s$  of their income.

The consumption of non-tradables  $C_N$  equals a proportion  $\lambda$  of total capitalist, landlord, and worker consumption:

<sup>5</sup>Some form of nominal rigidity is a logical pre-requisite for making wage-led growth possible. Here this could be justified by efficiency wage considerations or other factors such as unions in the modern sector of the economy.



$$C_N = \lambda \left[ \omega_N L_N + (1-s)RAL_N^\gamma + \frac{\bar{\omega}_T}{p_N} L_T + (1-s) \frac{\Pi}{p_N} \frac{K}{b} \right] \quad (6a)$$

where  $\Pi (= 1 - \bar{\omega}_T a)$  represents the share of profits in the tradable sector. The first two terms in the square brackets on the right hand side capture consumption by non-tradable sector workers and landlords, while the next two terms represent consumption by tradable sector agents. Employing eqs. (2), (3), and (5) allows us to consolidate the above expression.

$$C_N = \lambda \left[ (1-sR)AL_N^\gamma + \frac{(1-s\Pi)K}{p_N b} \right] \quad (6b)$$

We are now in a position to more closely explore the non-tradable sector. Output at any instant is determined by the amount of employment which is in turn ultimately determined by demand from the tradable sector. To see this, let's apply the  $N$ -sector equilibrium condition ( $Y_N = C_N$ ) which, after substitution from eqs. (1) and (6b) yields,

$$L_N = \left[ \frac{1}{Ap_N} \frac{\lambda(1-s\Pi)K}{1-\lambda(1-sR)} \frac{K}{b} \right]^{\frac{1}{\gamma}} = \left[ (1-s\Pi) \frac{\lambda\Lambda}{Ap_N} \frac{K}{b} \right]^{\frac{1}{\gamma}} \quad (7)$$

In the short run, the distributional variables  $\Pi$  and  $R$  are exogenously determined. The real exchange rate is given in the short run, as is the capital stock. Employment in the non-tradable sector varies to maintain equilibrium. An expansion of the tradable sector (a rise in  $K$ ) or a decline in the saving rate expands employment in the non-tradable sector, and the strength of these effects is captured by the “multiplier” term  $\Lambda \left[ = \frac{1}{1-\lambda(1-sR)} \right]$  in the rightmost expression.<sup>6</sup> A redistribution of income towards workers in either sector – that is, a decline in  $\Pi$  or  $R$  – too expands non-tradable employment, thanks to the differential saving behavior between workers and capitalists.

An alternative measure of worker income in the traditional non-tradable sector of an economy featuring significant underemployment assumes that this sector is characterized by work sharing. The “shared” or average remuneration ( $\tilde{\omega}_N$ ) is then given by total labor income divided by the number of workers not employed in the “modern” tradable sector. Thus,

$$\tilde{\omega}_N = \frac{\omega_N L_N}{L - L_T} = (1-s\Pi) \frac{v\gamma}{(L - L_T)} \frac{\lambda\Lambda K}{p_N b} \leq \omega_N \quad (8a)$$

where  $L$  is the size of the labor force,<sup>7</sup>  $L_T$  is employment in the tradable sector, and we have substituted from eqs. (2) and (7). The inequality on the right-hand side arises from the fact that, owing to un(der)employment,  $L - L_T > L_N$ .

<sup>6</sup>Note that, since  $s, R$  and  $\lambda$  are all less than one,  $\Lambda > 1$ . Note also that, since  $\lambda' < 0$ ,  $\Lambda$  is a negative function of the real exchange rate. Specifically,  $\partial\Lambda/\partial p_N = \lambda'(1-sR)\Lambda^2 < 0$ .

<sup>7</sup>Thus  $L$  includes the sum of employment in the two sectors as well as the unemployed. The terms “unemployment” and/or “underemployment” are much less well-defined in a low-income economy context. Employment in the modern tradable sector is constrained by the capital stock. Many workers who are unable to find a job there may either remain unemployed and wait, or work in the non-tradable sector, often sharing work with family members. These

Non-tradable worker income, by this measure, is positively correlated with the amount of capital employed in the tradable sector. To see this more clearly, let's substitute for  $L_T$  from equation (5) to derive:

$$\tilde{\omega}_N = (1 - s\Pi) \frac{v\gamma}{(bL - aK)} \frac{\lambda\Lambda}{p_N} K \quad (8b)$$

Thus, while an expanded tradable sector may, in the presence of diminishing returns, lower the real wage in the non-tradable sector, it has the opposite effect on the shared wage. Domestic consumption of the tradable good is specified analogously to that of non-tradables,

$$C_T = (1 - \lambda) \left[ (1 - sR)p_N AL_N^\gamma + \tilde{\omega}_T L_T + (1 - s)\Pi \frac{K}{b} \right]$$

which, after substitution from eqs. (5) and (7) simplifies to:

$$C_T = (1 - s\Pi)(1 - \lambda)\Lambda \frac{K}{b} \quad (9)$$

It will be useful at this point to define the profit rate  $r$  (per unit of capital):

$$r = \frac{P_T - W_T a}{P_K K} Y_T = \frac{1 - \tilde{\omega}_T a}{bp_K} = \frac{\Pi}{bp_K} \quad (10)$$

where  $p_K$  is the price of capital goods relative to that of tradables (and  $P_K$  is the corresponding nominal price). Our developing economy imports all investment goods at an internationally given price. With constant capacity utilization, investment,  $I_T$ , normalized by the capital stock, will generally be expected to vary positively with the profit rate. Ignoring capital depreciation,

$$\frac{I_T}{K} = f(r) = f\left(\frac{\Pi}{bp_K}\right); f' > 0 \quad (11)$$

Given equilibrium in the non-tradable sector, the macroeconomic equilibrium condition suffices to complete the model. Although it is reasonable to assume balanced trade over the long-run, it is equally plausible to expect deviations in the short run. I close the model by assuming that the trade balance ( $TB$ ) soaks up any differences between income and expenditure.

$$TB = \frac{Y_T}{K} - \frac{C_T}{K} - p_K \frac{I_T}{K}$$

where the trade balance is normalized by the capital stock for convenience. Thus, substituting from equations (5), (9), and (11), yields:

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features, of course, inspired the Harris-Todaro and Arthur Lewis frameworks.

The idea of a "shared" wage is introduced here to underline the fact that the welfare implications of an expansion in the tradable sector may be very different from those that one would derive from real wage movements in the presence of diminishing returns. It does not in any way affect our main results relating to capital accumulation. See Razmi et al. (2012) for a more detailed discussion.

$$TB = \frac{s}{b} [\lambda R + (1 - \lambda)\Pi] \Lambda - p_K f \left( \frac{\Pi}{b p_K} \right) \quad (12)$$

Recall that the right hand side of equation (12) incorporates non-tradable sector clearing. The equation can be written in implicit form as:

$$TB = TB(p_N; \bar{\omega}_T, s, v, p_K) \quad (13)$$

where  $TB_{p_N}, TB_v < 0$ ,  $TB_s > 0$ , and  $TB_{\bar{\omega}_T}, TB_{p_K} \geq 0$ . An available-on-request appendix provides detailed expressions for these comparative statics. Here I limit the explanation to an intuitive level.

A real appreciation (i.e., a rise in  $p_N$ ) or a rise in the labor share of output in the non-tradable sector generate greater consumer spending on tradables. The trade balance deteriorates as a result ( $TB_{p_N} < 0$ ). An increase in the saving rate has the opposite effect. Increased wages in the tradable sector too increase such spending but also reduce investment, leaving the net impact on the trade balance ambiguous. Finally, the effect of a negative terms of trade shock (a rise in  $p_K$ ) is also ambiguous. On the one hand it lowers the profit rate and investment, which helps the trade balance, while on the other it raises the cost of investment spending *per unit* of investment, which hurts the trade balance. The profit rate elasticity of investment determines the net impact.

### Long-Run Considerations

As mentioned earlier, it is reasonable to impose a trade balance constraint over the longer run, especially for a developing country. Suppose that the economy under consideration is limited by the availability of capital flows to a trade balance  $\overline{TB}$  in the long-run. This could be zero or, more generally, a non-zero constant. What variable would plausibly adjust to satisfy this constraint. The real exchange rate  $p_N$ , which is sticky in the short-run, is an obvious candidate in our set-up. Using a carat or “hat” to denote the rate of growth allows us to write down the adjustment mechanism as follows:

$$\hat{p}_N = j(TB - \overline{TB})$$

or, from equation (13),

$$\hat{p}_N = h(p_N; \bar{\omega}_T, s, v, p_K, \overline{TB}); h' > 0 \quad (14)$$

where  $h_{p_N}, h_v, h_{\overline{TB}} < 0$ ,  $h_s > 0$  and  $h_{\bar{\omega}_T}, h_{p_K} \geq 0$ .<sup>8</sup> A real appreciation creates a trade deficit (excess demand for tradables). Therefore,  $p_N$  must follow a downward path to remove this excess demand through expenditure switching. Hence the negatively-sloped trajectory in Figure 1.<sup>9</sup> As shown in the Appendix at the end of this paper, the steady state is characterized by:

$$\hat{C}_N = \hat{C}_T = \hat{Y}_T = \hat{Y}_N = \gamma \hat{L}_N = \hat{K} \quad (15)$$

<sup>8</sup>These signs follow directly from the partials emerging from equation (13).

<sup>9</sup>Specifically, the slope of the trajectory is given by,  $\frac{\partial \hat{p}_N}{\partial p_N} = h_{p_N} = j' \frac{\partial(TB)}{\partial p_N} < 0$ .

In other words, the growth rates of output, consumption, and capital stock growth are identical. This is not surprising given the balanced trade constraint in the steady state.

To sum up, our short-run set-up specifies fixed relative prices, with employment  $L_N$  adjusting in response to excess demand or supply in the non-tradable sector, and the trade balance  $TB$  absorbing imbalances at the macroeconomic level. The long-run steady state condition involves the real exchange rate adjusting to ensure a constant trade balance.

What are the prospects for wage-led growth in this economy? This is the question to which we now turn.

### Wage-Led growth

The structure of wage-setting in the tradable sector allows us to explore the issue of wage-led growth in this simple set-up. Suppose policy makers take steps to raise the nominal wage in the tradable sector. Given the lack of pricing power, the immediate effect is to lower the profit rate. This has two effects on the trade balance. By reducing domestic savings, it hurts the trade balance. By reducing investment, it helps it. Which effect dominates determines the resulting behavior of the real exchange. Suppose the savings effect dominates. This is illustrated by the lower dotted trajectory in Figure 1. In this case, the economy jumps to  $E_2$  and immediately develops a trade deficit following the redistributive shock. A real depreciation (i.e., a fall in  $p_N$ ) follows over time as the trade balance gradually adjusts. Alternatively, if investment is more sensitive to the profit rate than saving, then the economy initially jumps to point  $E_1$ , develops a trade surplus, and a real appreciation follows.

Either way, equation (11) tells us that accumulation slows down and the new steady state rate of (capital stock and output) growth is, therefore, lower. The only difference is that when investment is weakly sensitive to the profit rate, the living standard for tradable sector workers rises thanks to the fall in  $p_N$ . The degree of steady state underemployment in the non-tradable sector may also decline in this case, if the switching of domestic expenditures toward non-tradables dominates the fall in demand due to tradable sector shrinkage.

In mathematical terms, the change in the steady state levels of our variables of interest can be derived from eqs. (11) and (14).

$$\frac{dp_N}{d\bar{\omega}_T} \Big|_{\hat{p}_N=0} = -a \frac{f' - (1-\lambda)s\Lambda}{\lambda'(1-s\Pi)sR\Lambda^2} \leq 0$$

$$\frac{d(I/K)}{d\bar{\omega}_T} = -\frac{a}{bp_K} f' < 0$$

To sum up, the scope for wage-led growth in the traditional sense is non-existent in our simple dependent economy, although policy actions aimed at boosting the modern sector wage may, by lowering the price of non-tradables, further raise living standards for tradable sector workers. The effect on non-tradable sector employment is ambiguous, and so, therefore, is the effect on the non-tradable sector real wage.

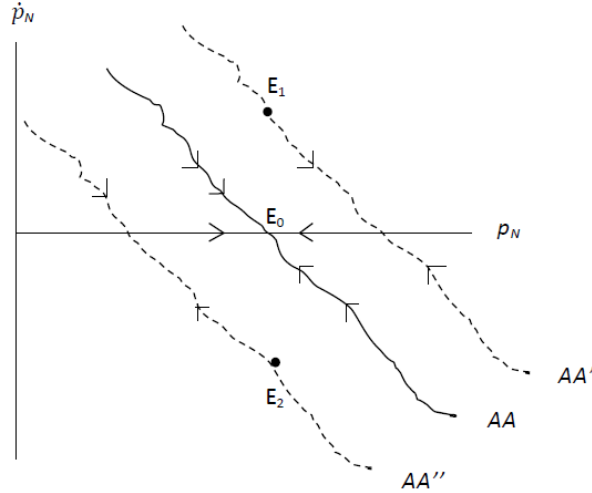


Figure 1: The dependent economy framework

In the absence of wage-led growth, could other policy actions raise real wages in the modern sector while simultaneously boosting long-run capital accumulation and growth? Raising the labor share of output in the non-tradable sector or lowering the saving rate generate real depreciations and raise the purchasing power of tradable sector workers. However, the steady state rates of accumulation, consumption, employment and output growth are unaffected.<sup>10</sup>

An option that does achieve both ends – that is, higher wages and faster growth – within our bare bones framework, is a decline in  $p_K$  (i.e., a positive terms of trade shock). By increasing the profit rate, such a shock boosts investment, which helps create a trade deficit. The valuation effect of the shock, on the other hand, works to improve the trade balance. If investment is sufficiently sensitive to the profit rate, a trade deficit coexists with increased investment along the transitional path and the end result is a depreciated real exchange rate. Real wages rise in terms of both goods and the economy experiences faster growth in the new steady state. This is a far cry from the standard wage-led growth story, however.

## 4 A 3-sector model

Next, consider a broader framework with three sectors. The non-tradable sector is similar to that in the previous section but, in order to accommodate heterogeneity in the nature of tradable goods, suppose that the tradable sector now consists of two sub-sectors. The homogeneous goods sector (or the  $H$ -

<sup>10</sup>See eqs. (11), (14), and (15).

sector), resembles the tradable sector from the last section in that it is a price taker and produces homogenous goods for domestic consumption and export. The differentiated goods sector (or  $D$ -sector), by contrast, produces a differentiated, high-quality good,<sup>11</sup> mainly for export to high-income industrialized countries.<sup>12</sup> Producers in this sector have some pricing power, thanks to the differentiated nature of their product. This creates a standard Kaleckian structure with the rate of capacity utilization  $u_D$  ( $= Y_D/K_D$ ) adjusting in response to excess demand or supply. In other words, aggregate demand now steps in as a determinant of output and profitability in the tradable sector.

Turning now to the formal set-up, the high quality good would be expected to grant greater room for price-setting by firms. Assuming a constant mark-up  $\tau$  over variable costs, in line with the Kaleckian tradition,<sup>13</sup> the price of the  $D$ -sector good is given by:

$$P_D = (1 + \tau)W_D a_D$$

Or, expressing relative prices in terms of the  $H$ -sector good (e.g.,  $p_D = P_D/P_H$ ), and once again taking the tradable sector real product wages as given,

$$p_D = (1 + \tau)\bar{\omega}_D a_D \quad (16)$$

With the rate of utilization adjusting, the profit rate,  $r_D$ , is given by,

$$r_D = \frac{P_D - W_D a_D}{P_K K_D} Y_D = \frac{(1 - \bar{\omega}_D a_D) p_D u_D}{p_K} = \frac{\Pi_D p_D u_D}{p_K} \quad (17)$$

The  $H$ -sector resembles the  $T$ -sector in the previous section. Again, I specify a fixed coefficient production function for a capital constrained sector:

$$Y_H = \min \left\{ \frac{L_H}{a_H}, \frac{K_H}{b_H} \right\} \quad (18)$$

The profit rate in the  $H$ -sector closely resembles that for the tradable sector in the previous section.<sup>14</sup>

<sup>11</sup>The quality differentiation here is in the vertical dimension. Vertically differentiated goods are different in terms of quality, so that consumers would prefer one over the others if they were sold at the same price.

<sup>12</sup>Think here, for example, of Colombia which exports most of its high quality brand name coffee to industrialized countries while directing lower quality varieties towards domestic markets (and also importing lower quality coffee from Peru). One could also think of major garment-exporting developing countries that target international markets for higher quality products while selling the more homogeneous lower quality garments domestically or in other developing countries. See also the references cited in footnote 22.

<sup>13</sup>In theory, one would expect to see a positive relationship between quality and the mark-up factor. This is because higher quality goods would presumably have fewer substitutes, reducing the price elasticity of demand for these goods.

<sup>14</sup>Notice that we are assuming that wages do not equalize between the two tradable sectors. I make this assumption here in order to enable us to think separately about wage increases in the two sectors. In the context of our main theme, this has the effect also of creating room for wage-led growth since a wage rise in the  $D$ -sector would impact exports negatively in the absence of such an assumption. The assumption also has theoretical and empirical backing

$$r_H = \frac{1 - \bar{\omega}_H a_H}{b_H p_K} = \frac{\Pi_H}{b_H p_K} \quad (19)$$

Again, it will be convenient to first describe the properties of equilibrium in the non-tradable (N) sector. As in the previous section, consumers devote a proportion  $\lambda$  of their spending to non-tradables. The rest is divided up between the two tradable goods, with a proportion  $\psi$  spent on the  $H$ -good. The consumption of the non-tradable good can then be expressed as follows:

$$C_N = \lambda \left[ (1 - sR) AL_N^\gamma + \frac{(1 - s\Pi_H) K_H}{p_N b_H} + \frac{(1 - s\Pi_D) p_D u_D K_D}{p_N} \right] \quad (20)$$

Applying the  $N$ -sector equilibrium condition ( $Y_N = C_N$ ) yields, after substituting from equations (1), (2), (3), and (5), and normalizing by  $K_H$ :

$$\frac{p_N AL_N^\gamma}{K_H} = \lambda \Lambda \left[ \frac{(1 - s\Pi)}{b_H} + (1 - s\Pi_D) p_D u_D k \right] \quad (21)$$

where  $k (= K_D/K_H)$  is the relative capital stock in the  $D$ -sector,  $\Lambda$  is the multiplier term from the previous section and, again,  $\partial\Lambda/\partial p_N < 0$ . Reminiscent of Section 3, an increase in output in either of the tradable sectors raises employment in the non-tradable sector, and if  $\gamma < 1$  (diminishing returns), reduces the real wage while raising the shared wage.<sup>15</sup> A re-distribution in either tradable sector towards wages too has the same effect. Employment in the non-tradable sector is demand-driven and wage-led in the present framework.

Let's turn now to the  $D$ -sector. Given the differentiated nature of the product, exports ( $X_D$ ) are a function of the price of domestic goods relative to the international good (which is, without loss of generality, taken to be  $p_K$ , i.e., the same as the price of the imported investment good). The standard imperfect substitutes export equation can be written as:

$$X_D = \frac{Z}{p_K} \left( \frac{p_K}{p_D} \right)^\beta ; \beta \geq 1 \quad (22)$$

where  $Z$  is world income. Domestic consumption of the  $D$ -good can be defined analogously to equation (20).

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from the heterogenous firm literature. Firms exporting to developed countries tend to be more productive and pay higher wages. See, for example, Verhoogen (2008) for the case of Mexico. I should stress, however, that as discussed later, relaxing this assumption only serves to weaken the case for wage-led growth in our context.

<sup>15</sup>The shared wage in this case is given by:

$$\bar{\omega}_N = \frac{\omega_N L_N}{L - L_T} = \frac{(1 - s\Pi) + b_H(1 - s\Pi_D) p_D u_D K_D}{b_H L - a K_H - b_H(1 - s\Pi_D) a_D u_D K_D} \frac{\lambda \Lambda}{p_N}$$

$$\frac{p_D C_D}{K_H} = (1-\lambda)(1-\psi) \left[ (1-sR) \frac{p_N A L_N^\gamma}{K_H} + \frac{(1-s\Pi_H)}{p_N} \frac{1}{b_H} + (1-s\Pi_D) p_D u_D k \right] \quad (23)$$

Equilibrium in the  $D$ -sector then implies that:

$$u_D k = \frac{C_D}{K_H} + \frac{X_D}{K_H} \quad (24)$$

where all the quantity variables are normalized by the capital stock in the  $H$ -sector,  $K_H$ . The first and second terms on the right hand side capture external and domestic demand, respectively. Substituting from eqs. (21), (22), and (23) suffices to derive the  $D$ -sector equilibrium condition.

$$p_D u_D k = \frac{(1-\lambda)(1-\psi) \frac{(1-s\Pi_H)}{b_H} + z \left( \frac{p_K}{p_D} \right)^{\beta-1}}{1 - (1-\lambda)(1-\psi)(1-s\Pi_D)\Lambda} \quad (25a)$$

where  $z = Z/K_H$ . An increase in the relative capital stock in the  $D$ -sector lowers utilization for a given level of demand. A decline in the saving rate has the opposite effect. Distribution of income away from  $H$ -sector capitalists and towards  $H$ -sector workers increases capacity utilization without affecting exports. This latter implication follows from the fact that wages in the two tradable sectors are unrelated to each other so that a rise in  $\bar{\omega}_H$  leaves exports unaffected. Although obviously extreme, this feature of the model helps stack the set-up in favor of wage-led growth since wage increases in the  $H$ -sector have no effect in this case on competitiveness. Redistribution toward profits in the  $D$ -sector, on the other hand, impacts exports negatively, and has effects broadly similar to those discussed by Blecker (2002).<sup>16</sup>

The specification of the domestic consumption of the  $H$ -sector good follows from the behavioral specifications:

$$C_H = (1-\lambda)\psi \left[ (1-sR)p_N A L_N^\gamma + (1-s\Pi_D)p_D u_D K_D + (1-s\Pi_H) \frac{K_H}{b_H} \right]$$

so that, substituting from equation (21), and again normalizing by  $K_H$ :

$$\frac{C_H}{K_H} = (1-\lambda)\Lambda\psi \left[ \frac{(1-s\Pi_H)}{b_H} + (1-s\Pi_D)p_D u_D k \right] \quad (26)$$

The terms in the square brackets on the right hand side capture tradable sector spending on the  $H$ -good, while the term  $(1-\lambda)\Lambda$  captures the effect of demand originating from the non-tradable sector. Recall that spending by

<sup>16</sup> Recall from our earlier discussion in Section 1 that the prospects of wage-led growth in a traditional Kaleckian open economy are relatively limited *precisely* because wage growth hurts competitiveness and exports. By de-linking the two wages, we eliminate this channel inhibiting wage-led growth. More on this below.



$T$ -sector agents affects total spending both directly and indirectly through increased  $N$ -sector income.

Finally, let's specify investment functions similar to the one in Section 3. For simplicity I assume linear homogeneous forms and ignore capital depreciation.

$$\frac{I_D}{K_D} = \alpha(r_D) = \alpha\left(\frac{\Pi_D p_D u_D}{p_K}\right); \alpha > 0 \quad (27)$$

$$\frac{I_H}{K_H} = \delta(r_H) = \delta\left(\frac{\Pi_H}{b_H p_K}\right) = \delta\left(\frac{\Pi_H}{b_H p_K}\right); \delta > 0 \quad (28)$$

We are now ready to write down the macroeconomic equilibrium condition. Once again normalizing all variables, this time by  $P_H K_H$ , yields, after substituting in the  $N$ -sector equilibrium condition:

$$TB = \frac{Y_H}{K_H} - \frac{C_H}{K_H} + \frac{p_D X_D}{K_H} - \frac{p_K I_H}{K_H} - \frac{p_K I_D}{K_H}$$

or, after substitutions from eqs. (18), (22), (26), (27) and (28) and considerable manipulation:

$$TB = \frac{1}{b_H} [1 - (1 - \lambda)\Lambda\psi(1 - s\Pi_H) - \delta\Pi_H] - [(1 - \lambda)\Lambda\psi(1 - s\Pi_D) + \alpha\Pi_D] p_D u_D k + z \left(\frac{p_K}{p_D}\right)^{\beta-1} \quad (29)$$

The expression above warrants a closer look at the right hand side. The first line captures the positive effect of higher  $H$ -sector output – net of investment and increased expenditure – on the trade balance. The second line captures two effects: (1) the negative one of increased  $D$ -sector utilization, and hence spending and investment, and (2) the positive one of increased exports of the differentiated good.

Equations (25a) and (29) constitute a system of two equations in  $TB$  and  $u_D$ , which together ensure  $D$ -sector and macroeconomic equilibrium, with  $N$ -sector clearing incorporated. Walras's law ensures clearing of the  $H$ -good market.<sup>17</sup>

<sup>17</sup>To keep the big picture in mind, there are four underlying equilibrium conditions:  $N$ -sector clearing,  $H$ -sector clearing,  $D$ -sector clearing, and macroeconomic equilibrium, respectively.

$$Y_N = C_N \quad (A)$$

$$Y_H = C_H + NX_H \quad (B)$$

$$Y_D = C_D + X_D \quad (C)$$

$$\begin{aligned} Y &= p_N Y_N + Y_H + p_D Y_D \\ &= p_N C_N + C_H + p_D C_D + p_K(I_H + I_D) + NX_H + p_D X_D - p_K(I_H + I_D) \\ &= p_N C_N + C_H + p_D C_D + p_K(I_H + I_D) + TB \end{aligned} \quad (D)$$

The real exchange rate and relative capital stock evolve over time, as described later. Written in implicit form, the system becomes:

$$D(k, p_N; \bar{\omega}_H) = 0 = p_D u_D k - \frac{(1-\lambda)(1-\psi) \frac{(1-s\Pi_H)}{b_H} + \left(\frac{p_K}{p_D}\right)^{\beta-1} z}{1 - (1-\lambda)(1-\psi)(1-s\Pi_D)\Lambda} \quad (30a)$$

$$T(k, p_N; \bar{\omega}_H) = 0 = TB - \frac{1}{b_H} [1 - (1-\lambda)\Lambda\psi(1-s\Pi_H) - \delta\Pi_H] + [(1-\lambda)\Lambda\psi(1-s\Pi_D) + \alpha\Pi_D] p_D u_D k - z \left(\frac{p_K}{p_D}\right)^{\beta-1} \quad (30b)$$

The results for the first two comparative static exercises (involving  $k$  and  $p_N$ ) based on this system are straightforward. Changes in relative capital stocks have no effect on the trade balance. A real appreciation (rise in the relative price of non-tradables) switches domestic demand toward tradables, increases utilization, and generates a trade deficit.

The effect of a wage rise in the  $H$ -sector, our main thought experiment of interest, is a bit more involved, and Figure 2 may help guide intuition. The  $D$ -curve is based on equation (30a), and represents the locus of points along which both the  $N$ -sector and the  $D$ -sector are in equilibrium. It is vertical because that equation imposes no constraint on the trade balance for any given rate of utilization. The TT-curve, which represents equation (30b) shows the locus of points along which trade is balanced. It is downward-sloping since higher capacity utilization induces a trade deficit. Now, a wage rise in the  $H$ -sector raises consumption of both tradable goods and increases utilization in the  $D$ -sector while reducing profitability and investment in the  $H$ -sector. Except for the last effect (i.e., the decline in investment), all the other effects tend to reduce the trade balance. I will assume, therefore, that a trade deficit is created, although our main result about steady state growth is independent of this sign. In graphical terms the higher spending resulting from re-distribution away from savers means that higher utilization is now consistent with  $D$ -sector equilibrium. The DD-curve shifts rightward. Redistribution away from savers, starting from balanced trade, also means creation of a trade deficit. The TT-curve shifts downward. The short-run equilibrium now involves higher capacity utilization. This is the traditional neo-Kaleckian wage-led result.

In sum, based on the comparative statics described in the previous two paragraphs, the solutions to eqs. (30a) and (30b) emerge in implicit form as:

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where  $NX_H$  denotes *net* exports of the  $H$ -good, and  $Y$  denotes total income in terms of the  $H$ -good. Imposing  $N$ -sector clearing on equation (D) yields:

$$Y_H + p_D Y_D = C_H + p_D C_D + p_K I_H + p_K I_D + TB$$

which along with the definition of  $X_D$  leads to the trade balance condition. With  $N$ -sector clearing, the satisfaction of any 2 of the 3 equations (B)-(D) ensures satisfaction of the third.

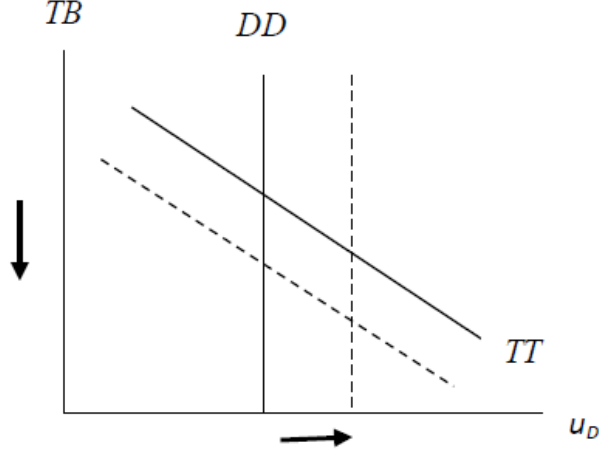


Figure 2: The comparative statics of a rise in the H-sector wage ( $\bar{w}_H$ )

$$u_D = u_D(k, p_N; \bar{w}_H); u_{Dk} < 0, u_{Dp_N}, u_{D\bar{w}_H} > 0 \quad (31a)$$

$$TB = TB(k, p_N; \bar{w}_H); TB_k = 0, TB_{p_N}, TB_{\bar{w}_H} < 0 \quad (31b)$$

The available on request appendix provides more detailed mathematical solutions to these comparative static exercises.

### Back to the long-run

It is time now to turn to the long run. Recall that  $p_N$  and  $k$  are state variables. As in Section 3, let's suppose that the real exchange rate adjusts over time in response to trade imbalances. Making use of equation (31b),

$$\hat{p}_N = l[TB(k, p_N; \bar{w}_H) - \overline{TB}]; l' > 0 \quad (32)$$

or, in the steady state,

$$\hat{p}_N = \hat{p}_N(k, p_N; \bar{w}_H, \overline{TB}) = 0; \hat{p}_{Nk} = 0, \hat{p}_{Np_N}, \hat{p}_{N\bar{w}_H} < 0 \quad (33)$$

and the signs of the partials follow from equation (31b). In the long-run, the real exchange rate approaches a constant steady state value. Since we have two tradable sectors, long-run considerations would also plausibly require that the capital stocks grow at the same rate in the steady state.

$$\hat{k} = \hat{K}_D - \hat{K}_H = 0 \quad (34)$$

Making the necessary substitutions from eqs. (27), and (28) yields:

$$\hat{k} = \alpha \frac{\Pi_D p_D u_D}{p_K} - \delta \frac{\Pi_H}{p_K b_H} \quad (35)$$

The partials can be evaluated based on the solutions described by eqs. (31a) and (31b), and the detailed mathematical expressions are provided in the available on request appendix. Here I describe these in intuitive terms. A reduction in the relative capital stock in the  $H$ -sector (i.e., a rise in  $k$ ) reduces demand for the  $D$ -good. Lower utilization and investment in this sector results. A real appreciation shifts domestic expenditure towards tradables, increasing utilization and investment in the  $D$ -sector. A rise in the nominal wage in the  $H$ -sector reduces profitability in that sector while increasing spending on the  $D$ -sector good.  $D$ -sector utilization gets a boost and relative investment in the  $D$ -goods sector rises. This is traditional Kaleckian wage-led growth in action.

To summarize,

$$\hat{k} = \hat{k}(k, p_N; \bar{\omega}_H); \hat{k}_k < 0, \hat{k}_{p_N}, \hat{k}_{\bar{\omega}_H} > 0 \quad (36)$$

As we will see shortly, the reduction in profitability following a wage increase in the  $H$ -sector is crucial. It means lower  $H$ -sector investment, and, given balanced growth, lower steady state growth. The underlying economic mechanism originates from the decline in utilization that emerges from a shrinking  $H$ -sector. Notice that the negative impact on steady state growth occurs even under a set-up like ours which, by assuming no impact of a real appreciation or wage increase on  $D$ -sector exports, seriously biases the results towards making wage-led growth feasible.

Turning to the steady state, again it is characterized by (see the Appendix):

$$\hat{C}_N = \hat{C}_H = \hat{C}_D = \hat{Y}_H = \hat{Y}_D = \hat{Y}_N = \gamma \hat{L}_N = \hat{K}_H = \hat{K}_D \quad (37)$$

Notice that the profit rates in the two sectors will generally differ in the steady state as long as  $\alpha \neq \delta$ . This simplifying assumption of non-zero profit rate differentials does not matter for our main qualitative results, which remain unchanged in the special case where  $\alpha = \delta$  so that sectoral profit rates equalize.

Before we turn to steady state changes and transitional dynamics, let's once again utilize graphical devices to facilitate intuition. Figure 3 illustrates the long-run model defined by the system of differential equations (33) and (36) in  $p_N$  and  $K$ . We already know from equation (31b) that the trade balance is independent of *relative* capital stocks, resulting in a horizontal  $\hat{p}_N = 0$  isocline. An increase in the relative capital stock in the  $D$ -sector reduces capacity utilization and investment. A real appreciation is required to boost investment by diverting domestic consumption to tradable goods, and hence boosting  $D$ -sector utilization and investment; thus the upward-sloping  $\hat{k} = 0$  isocline.

Since the system is non-linear, we have to resort to Taylor linearization to explore local stability. The Jacobian matrix of the system is given by:

$$\Delta_1 = \begin{bmatrix} \hat{k}_k & \hat{k}_{p_N} \\ 0 & \hat{p}_{N p_N} \end{bmatrix}$$



dampening the initial boost to investment in the  $D$ -sector. Thus, although the real exchange rate depreciates, the overall effect on the composition of the tradable sector capital stock is ambiguous, although it is likely to shift towards the  $D$ -sector. Mathematically, the steady state results are as follows:

$$\frac{dk}{d\bar{\omega}_H} = \frac{\hat{k}_{p_N} \hat{p}_{N\bar{\omega}_H} - \hat{k}_{\bar{\omega}_H} \hat{p}_{Np_N}}{|\Delta_1|} \geq 0; \quad \frac{dp_N}{d\bar{\omega}_H} = -\frac{\hat{p}_{N\bar{\omega}_H}}{\hat{p}_{Np_N}} < 0$$

Second, and more importantly, the new steady state growth rate is unambiguously *lower*. This is because accumulation in the price-taking homogeneous goods sector (the  $H$ -sector) places a limit on the steady state growth rate, and investment in this sector actually slows down following the rise in wages (see equation (28)). Figure 4 illustrates the transitional dynamics in this case, which involve real depreciation and an expanding  $D$ -sector. The latter is reminiscent of the traditional neo-Kaleckian wage-led growth story, although, of course, here it occurs during the transition only.

To summarize, our results replicate those from the dependent economy model even after including a differentiated goods-producing tradable sector, and in spite of the implausible assumption that wage growth does not affect exports from the sector where utilization adjusts. The intuition is simple. The homogeneous goods sector places a ceiling on the growth rate. An increase in the product wage in that sector lowers that ceiling. In economic terms, the shrinking of the homogeneous goods sector drags growth in the other tradable sector down with it through the utilization/aggregate demand channel.

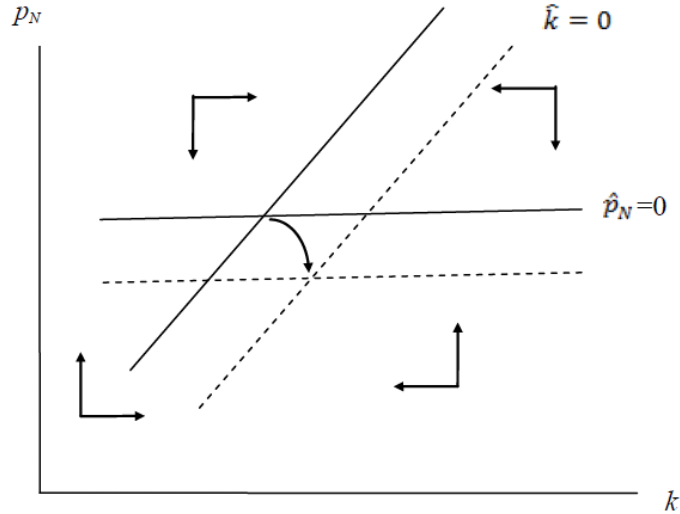


Figure 4: An increase in the H-sector wage

What kind of shock would raise the ceiling placed by the homogeneous goods

sector while simultaneously generating rising real (consumption) wages? Again, we can replicate the analysis of the previous section. A positive terms of trade shock, i.e., a decline in  $p_K$ , could plausibly achieve both the above-mentioned objectives. Its effect on accumulation in the  $H$ -sector is unambiguously positive, thus loosening the constraint on accumulation. It also generates a trade deficit and real exchange rate depreciation. Graphically, the  $\hat{p}_N = 0$  isocline shifts down while the other isocline could shift up or down. The steady state level of the real exchange rate is lower while the shift in the structural composition of capital is ambiguous. Thus, a win-win situation could emerge, with both real consumption wages and accumulation rising. Again, however, this is a far cry from the traditional wage-led growth story.

### Related thought experiments

We have analyzed in detail the effect of an increase in the  $H$ -sector wage. What if it is the wage in the  $D$ -sector that increases? An increase only in  $\bar{\omega}_D$  will leave the steady state growth rate untouched (eqs. (28) and (34)). Thus, not much is added to the analysis in terms of new findings if we follow the traditional neo-Kaleckian literature in ignoring the non-tradable sector. Incorporating this sector, however, leads to an interesting insight. Even if an increase in  $\bar{\omega}_D$  does not raise the steady state growth rate, it does generate employment in the tradable sector, and thus, via equation (8a), raise the average or shared income in the non-tradable sector.

Next, how does our analysis change if labor mobility between the two tradable sectors causes wages to be identical? An increase in this general tradable sector wage now has an even greater adverse effect on accumulation since, on top of the loss of profitability suffered by the  $H$ -sector (equation (28)) emphasized in this section, we have the loss of international competitiveness in the  $D$ -sector. As discussed in Section 2, this latter case, minus the  $H$ -sector, has already been analyzed by Blecker (1989) among others, and not much is added by incorporating this complication.

How does the analysis proceed if redistribution takes place towards non-tradable workers instead? A rise in  $v$ , increases demand for the  $D$ -good and hence shifts the composition of the economy towards the differentiated goods sector without affecting the ceiling on long-run steady state growth. However, if redistribution following from land reforms or technical change in the non-tradable sector lowers the price of food, and help bring down the real product wage in the tradable sectors, then the growth ceiling set by the homogeneous goods sector is raised, giving a boost to steady state growth. This mechanism, which many development economists argue triggered the initial growth phase in the East Asian tigers,<sup>18</sup> is a far cry from the traditional Kaleckian wage-led growth case, however. Indeed it is more reminiscent of the arguments made by Ricardo against the English Corn Laws.<sup>19</sup>

<sup>18</sup>See, for example, Gray (2013).

<sup>19</sup>Although of course Ricardo was making the argument against import tariffs on food, and not for land reforms.

## 5 A possible implication

The presence of a low-quality, homogeneous goods-producing sector as a ceiling on wage-led accumulation has an interesting corollary. Growing South-South trade has been one of the leading stories of recent decades. According to UNCTAD (2012), for instance, the share of intra-South trade increased from 42 per cent in 1992 to 56 per cent in 2010 for developing countries. Does this development affect the scope for wage-led growth one way or another? The answer, from the perspective of our model, depends on whether there are any broad differences between the products that developing countries export to advanced economies versus those exported to other developing countries. Recent theoretical and empirical work provides some guidance in this regard.

A body of trade literature, inspired especially by Melitz (2003) has started looking at heterogeneity at the firm rather than national level. This literature hypothesizes and finds that firms are heterogenous in terms of productivity even within the same industries. Exporting firms tend to be larger, hire more skilled labor, pay higher wages, and are more productive. Moreover, the most productive firms tend to export higher quality products to high income destinations. This could either be due to a preference for quality amongst high income consumers,<sup>20</sup> or due to the presence of retail, transportation, and other transaction costs along the way that make it worthwhile to export only higher quality, higher-priced products to high income destinations.<sup>21</sup> Based on an econometric study of Argentinian firms, for example, Brambilla et al. (2012) find that firms exporting to other developing country markets such as Brazil sell the same quality products that they sell domestically. In contrast, firms exporting to high income countries hire more skilled workers and sell higher quality products. Thus, while exporting by itself does not lead to quality upgrading, exporting to high income countries does. The destination of exports matters and quality upgrading and prices tend to increase with the per capita income of the importing country.<sup>22</sup> A major implication from the perspective of this paper is that, to the extent that South-North trade involves a greater proportion of higher quality, differentiated goods compared to South-North trade, growing intra-South interactions increasingly constrain the possibility of wage-led growth.

While an empirical investigation would require a comprehensive effort, Table 2 provides some preliminary evidence regarding the relevance of this implica-

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<sup>20</sup>See Hallak (2006) and Verhoogen (2008).

<sup>21</sup>See Brambilla et al. (2012).

<sup>22</sup>See also Manova and Zhang (2012) for evidence based on Chinese firms, Flach (2011) for an empirical study of Brazilian firms, and Rankin and Schoer (2013) for evidence from South African firms. Interestingly, the findings from the latter study suggest that firms in South Africa – a middle income country – while exporting higher quality products to high income countries may actually export products to low income developing countries in the region that are of *lower* quality than their domestic sales. For survey-based evidence, see the comprehensive study of Colombian firms carried out by Morawetz (1980). The study notes the quality control and product differentiation-related issues faced by Colombian exporters when selling to industrialized countries unlike when they sell to Venezuela and the Caribbean, which is little different, according to the author's study, from selling at home. See also Brooks (2006) for more evidence from Colombia.



tion. The Table shows the export composition of three of the largest low- and low-middle income country exporters – India, Indonesia, and Vietnam, or “the big 3” –<sup>23</sup> to their ten largest advanced and developing country destinations (5 advanced and 5 developing country).<sup>24</sup> For each country, these exports, disaggregated at SITC (Rev.2) 4-digit level, are categorized as homogenous or differentiated according to the classification originally developed by Rauch (1999). Homogeneous goods (including homogeneous and reference-priced according to the Rauch classification) are goods traded on an organized exchange or those for which published reference prices are quoted in trade publications. Differentiated goods by their very nature lack these characteristics. Rauch proposed two definitions, a conservative and a liberal one in order to address some ambiguous cases. Although the differences are minor, the conservative definition classifies slightly fewer commodities as homogeneous. I employ both classifications. Table 2 reports aggregated Indian, Indonesian, and Vietnamese exports separately for the developing and advanced country destinations. For each country, the ratio of exports to advanced countries to that of exports to developing countries is then calculated separately for homogeneous and differentiated goods. For example, India exported 19.6 billion dollars worth of homogeneous goods to its 5 largest advanced country destinations in 2011. The corresponding number for its exports to its 5 largest developing country destinations was 17.9 billion. This yields a ratio of 1.09 (=19.6/17.9). The higher this ratio, the more tilted exports of a category of goods is towards advanced economies.

A look at Table 2 reveals that big 3 exports are markedly more biased towards differentiated goods when exporting to advanced countries than to other developing countries. For example, as noted above, the Indian ratio is 1.09 for homogeneous goods while that for differentiated goods is 3.74. Moreover, this pattern is consistent across the big 3, and across the liberal and conservative classifications. South-South trade appears to involve homogeneous goods more intensively than South-to-North exports.

## 6 Concluding remarks

The subject of wage- versus profit-led growth has been a matter of intense discussion amongst economists in the neo-Kaleckian tradition. Accumulation and growth can be wage-led in a closed economy if the effect of redistribution towards spenders outweighs the potential negative effect of a lower profit share on investment. As shown by existing literature, the potential for wage-led growth narrows in an open economy that exports differentiated goods. This

<sup>23</sup>I follow the World Bank’s *World Development Indicators* in setting an upper gross national income per capita of \$4,085 for low- and low-middle income countries. Our frameworks in the following two sections are based on a low-income developing economy. All data were obtained from the United Nation’s *COMTRADE* database.

<sup>24</sup>These destinations are: Belgium, Germany, Netherlands, UK, USA, Brazil, Sri Lanka, China, Indonesia, and South Africa for India, Australia, Germany, Japan, Netherlands, USA, China, Malaysia, Philippines, India, and Thailand for Indonesia, and Australia, Germany, Japan, UK, USA, Cambodia, China, Indonesia, Malaysia, and Thailand for Vietnam.

Table 2: Composition of the 3 largest low-income country exporters in 2011.

	Conservative			Liberal		
	Advanced	Developing	Ratio	Advanced	Developing	Ratio
India						
Homogeneous*	1.96E+10	1.79E+10	1.09	2.23E+10	1.85E+10	1.20
Differentiated	3.44E+10	9.20E+09	3.74	3.17E+10	8.60E+09	3.68
Indonesia						
Homogeneous	3.77E+10	2.77E+10	1.36	3.83E+10	2.86E+10	1.34
Differentiated	2.06E+10	9.95E+09	2.06	2.00E+10	9.06E+09	2.20
Vietnam						
Homogeneous	9.63E+09	1.11E+10	0.86	1.04E+10	1.30E+10	0.80
Differentiated	2.61E+10	8.03E+09	3.25	2.53E+10	6.18E+09	4.09

\* Exports classified in accordance with Rauch (1999). Homogeneous goods include both goods traded on organized exchanges and reference priced goods. Exports in current US dollars.

literature, however, largely ignores the distinction between tradables and non-tradables and that between different types of tradable goods.

I show that wage-led growth is not feasible, barring other developments such as adjusting productivity growth, in a small open developing economy that has a tradable sector. I show this in two steps. First, I use a modified dependent economy model, with a tradable sector that produces a homogenous good, and is, therefore, a price-taker in international markets. The lack of an aggregate demand channel renders the potential for wage-led growth non-existent. I then consider the more interesting case of an economy that has two tradable sectors: one that produces higher quality differentiated goods and the other that produces homogeneous goods. In order to expand the scope for wage-led growth, I isolate sectoral wages, and assume that wages are raised in the homogeneous goods sector so that differentiated good exports are not directly hurt. The analysis shows that wage-led growth remains unfeasible as long as a homogeneous goods sector is present to limit accumulation along a balanced growth path. This underlines the observation that our main result follows from the presence of a homogeneous good exporting sector, not from the loss of competitiveness in the differentiated goods sector, as in the standard Kaleckian set-up. Such a sector continues largely to be absent from Kaleckian models.

Does our main result negate the desirability of pursuing wage growth? Not necessarily. For one, policy makers may have other objectives in addition to aggregate growth. Higher wages in the homogeneous goods sector are likely to shift the structure of the economy towards the differentiated goods sector. This, along with the resulting rise in per capita income outside the tradable sector, may be a desirable end in and of itself. Secondly, in the 3-good framework, raising wages does increase  $D$ -sector capacity utilization and investment during the transition in the traditional Kaleckian manner. Thirdly, producers may to some extent respond to higher wages by pursuing greater efficiency and productivity growth. This will dampen the drag that wage growth in the homogeneous good sector places on overall accumulation. The analysis here does suggest, how-

ever, that prospects for wage-led growth are tightly constrained in a developing economy that has a homogeneous goods-exporting sector. To the extent that intra-South trade is biased towards relatively homogeneous, low-quality goods, a major corollary is that such trade narrows the scope for wage-led growth in a low-income developing economy.

## 7 Appendix

This appendix derives the steady state growth rates of consumption, output, and capital as described in the main text by eqs. (15) and (37).

### The two-sector model

Since  $p_N$  is constant in the steady state, so are  $\lambda$  and, thus,  $\Lambda$  and  $TB$  (see eqs. (4) and (12)). Thus, equation (7), (9) and (11) imply after log-differentiation that:

$$\hat{L}_N = \frac{1}{\gamma}\hat{K}, \hat{C}_T = \hat{K} = \frac{I}{K} \quad (\text{A1})$$

Log-differentiating equation (6b) and substituting for  $\hat{L}_N$  from equation (A1) yields,

$$\hat{C}_N = \hat{K} \quad (\text{A2})$$

which, in conjunction with (the log-differentiated versions of) eqs. (1) and (5) delivers equation (15).

### The three-sector model

From equation (33)  $p_N$  is constant in the steady state, as are therefore  $\lambda$  and, thus,  $\Lambda$ . Furthermore, eqs. (32), (33) and (34) inform us that  $TB$  and  $k$  too are constant. This means, via equation (25a), that:

$$\hat{u}_D = -\hat{k} = -(\hat{K}_D - \hat{K}_H) = 0 \quad (\text{A3})$$

Log-differentiating equation (26) and utilizing equation (A3) then yields:

$$\hat{C}_H = \hat{K}_H = \hat{K}_D \quad (\text{A4})$$

Next, log-differentiating equation (21) and making use of the fact that  $k$  and  $u_D$  are constant in the steady state (see eqs. (34) and (A3)), and employing equation (1) helps conclude that:

$$\gamma\hat{L}_N = \hat{K}_H = \hat{Y}_N = \hat{C}_N \quad (\text{A5})$$

Finally, log-differentiating equation (23), and substituting from equation (A5) gives us:

$$\hat{C}_D = \hat{K}_H$$

which completes the derivation of equation (37).

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