Uneven Development with Unlimited Supplies of Labor (Draft)

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Abstract

To explain uneven development, balance of payment constrained growth (BPCG) models emphasize external demand conditions in the spirit of Thirlwall's Law. However, economists such as Arthur Lewis and Ragnar Nurkse have argued that productivity of the internal economy is an important variable determining the gap between the South and North because it improves terms of trade and allows for the integration of exporting and domestic sectors. The internal economy is comprised of the sectors which produce for domestic consumption. This paper combines BPCG modeling framework with the theories of Lewis and Nukse to produce a North-South model where internal productivity determines income elasticities, and thus affects terms of trade and long-run growth. I also show that elasticity ratios are vital for North-South convergence using estimations for 1985-2019.

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Keywords: International Trade, Thirlwall's Law, Uneven Development, Subsistence Productivity, Lewis Model, Balanced Growth.

JEL Codes: .

1 Introduction

Arthur Lewis argued that the primary cause of uneven development between the 'North' and 'South' was pricing power, i.e., the terms of trade between the two types of countries. Prebisch (1962) and Singer (1950) reached the same conclusions, but they reasoned this was due to the South exporting cheap primary products while the North exported more expensive manufacturers. Lewis (1978: 37)[1], on the other hand, argued:

> "The terms of trade are bad only for tropical products, whether agricultural or industrial, and are bad because the market pays tropical unskilled labor, whatever it may be producing, a wage that is based on an unlimited reservoir of low-productivity food producers."

It does not matter what product the South exports; the prices they offer the international market will be relatively cheaper due to low productivity in the sectors responsible for domestic consumption, which we will call the *internal or domestic sector*.

The contribution is to produce a model where the ratio of export elasticities to import elasticities, the elasticity ratio, is affected by domestic sector productivity. Given that the South has low-productive, informal employment in the domestic sector, the elasticity ratios are unfavorable and uneven development with the North ensues. The model is an extension of Dutt (2002) to include the arguments of Nurkse (1971) and Lewis (1978) (1980). However, the South's fate is not sealed in relative poverty. They can close the income gap with the North by increasing the productivity of the internal economy, which, among other things, will improve their terms of trade and elasticity ratios. The model derives much from Ragnar Nurkse's theory of balanced growth (Nurkse, 1971), whose argument is essentially the same as Arthur Lewis

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[1]While Lewis (1978) and (1980) explicitly outline the importance of internal productivity, this train of thought is in his previous work including his seminal article, *Economic Development with Unlimited Supplies of Labour*, "The main reason why tropical commercial produce is so cheap, in terms of the standard of living it affords, is the inefficiency of tropical food production per man. Practically all the benefit of increasing efficiency in export industries goes to the foreign consumer; whereas raising efficiency in subsistence food production would automatically make commercial produce dearer" (1954: 30).

(1978) (1980). Nurkse explains that the size of their domestic market limits underdeveloped countries. Increasing the productivity of this market will create new sources of demand, allow new industries to flourish, and spark a cumulative growth cycle. Nurkse (1971: 127) states:

> "Under these conditions, if there is to be any development at all, it must concentrate at least initially on production for local requirements; and so long as this development increases the level of productivity and hence of real purchasing power, it will tend in the long run to help rather than hinder the growth of international trade."

The informal sector produces essential products for domestic consumption, such as food, clothing, homes, furnishings, etc., in underdeveloped countries. Lewis (1978) uses 'food' and 'subsistence' interchangeably, and Nurkse (1971) uses 'the domestic market' or 'local requirements.' They all refer to the internal sector, or production for domestic consumption; we will also adopt Nurkse's (1971) terminology throughout the paper. Improving this productivity releases internal sector employment out of informality. In doing so, food, clothing, and other essentials will be more readily available domestically and extra income is generated for the consumption of other products. Reminiscent of Say's Law, this extra supply creates demand, causing new industries to form, or old ones to grow. The growth will alleviate the country's dependence on imports and also increase the range of exports, thus improving elasticity ratios. In the BPCG framework, this leads to a rise in the terms of trade and long-run growth. Instead, if the country increased productivity of the modern exporting sectors, the benefits accrue to the importing country due to lower prices, thus possibly lowering the incomes of the economy and forcing workers into informality. This can be done through channeling government taxation into investment aimed at raising internal productivity.

Raising productivity of the informal economy does not mean they need to produce modern manufactures, be owned by large capitalist firms, or have their workers migrate to urban areas. Instead, it is the informal economy's production that needs to be transformed, as they produce essential products for domestic consumption. Exporting sectors in underdeveloped countries

often have no relationship with the domestic economy. The production is not consumed internally, and foreign-owned multinational corporations siphon profits. These sectors can have high productivity, ample capital intensity, and have all the signs of being 'modern,' but this does not spill over to the internal economy. A rise in the productivity of the internal sector will assist in connecting the exporting and domestic economy. The extra purchasing power can be used to consume the export product domestically and for entry into new industries. In turn, this will boost the production of the exporting sectors and create a cumulative cycle of growth.

The informal sector is "the farmers, the casuals, the petty traders, the retainers (domestic and commercial), women in the household, and population growth" (Lewis (1954): 4) with a low marginal productivity. The International Labour Organization (ILO, 2024) defines it as "all economic activities by workers and economic units that are – in law or in practice – not covered or insufficiently covered by formal arrangements." The two definitions are different, mainly due to the latter not defining informality by the level of productivity. For our purposes, we operate at the overlap between them. The informal economy has low marginal productivity and is not covered by formal arrangements. Therefore, raising internal productivity, assuming it is done mainly in informality, will naturally decrease the degree of informality in both uses of the term. On one hand, the marginal productivity will rise, and on the other, it implies a change to the production arrangement. However, it does not necessarily mean that local producers are transformed into a modern sector; more precisely, they are closer to a modern sector, if not already there.

The model presented here explains uneven development as a product of a large informal economy that keeps internal productivity low. Uneven development is not inevitable, however. It could be overcome through raising internal productivity and loosening BP equilibrium constraints. The following section reviews the relevant literature. After that, I introduce the theoretical model. In section 4 I present some stylized facts about North-South trade and deter-

minants of elasticity ratios. The final section discusses the model's implications and concludes.

2 Literature Review

The basis of BPCG models is that the summation of a country's current and financial accounts must be zero in the long run. In other words, total payments coming in and out of the country must be balanced at a point known as 'BP Equilibrium.' In the long run, this equilibrium point places limits on the growth of national income. BPCG is a theory of Post-Keynesian macroeconomics originated by Thirlwall (1979). Under BPCG, output is driven primarily by external demand since more money entering the country loosens the BP constraint. For a historical overview of BPCG, see Thirlwall (2012), and for a review of the recent extensions, see Blecker (2022).

The current model fits in the North-South literature of BPCG models. Dutt (2002) is the first to expand BPCG to explain uneven development between the North and the South using Thirlwall's Law (Thirlwall, 1979). In the long run, terms-of-trade must adjust so the BP equilibrium holds. If the import elasticity of demand of the South is greater than that of the North, terms-of-trade will move unfavorably for the former and result in uneven development. Although due to different assumptions, Thirlwall's Law (Thirlwall, 1979) and the Prebisch-Singer hypothesis (Prebisch, 1962) (Singer, 1950) argue that the type of exports are the main cause of uneven development.

Vera (2006) extends Dutt (2002) to include trade imbalances and net financial transfers. In this extension, there is still the possibility of uneven development but also of mutual growth or contraction between the North and the South. Also, Sasaki (2008-09) allows for technical progress to change trade patterns between the North and the South. The South will converge or diverge depending on its level of technology.

Spinola (2020) expands on Dutt (2002) to include a system of four differential equations: a productivity gap with catching up by the South, labor market dynamics to derive the profit share of income, labor supply as a transfer between the informal to modern sectors in the spirit of Lewis (1954), and terms-of-trade evolution as in Dutt (2002). Spinola (2020) produces profit-led Goodwinian cycles. The movement of the productivity gap between the two regions drives convergence/divergence. Lastly, Sasaki (2021) extend Dutt (2002) to allow for alternative specifications of Northern demand.

North-South uneven development theory is not limited to BPCG. Kaldor (1978) has proposed that the North experiences increasing returns for their manufactured production while the South has decreasing returns in their primary products. The notion of increasing returns has been a common assumption of the 'new' trade theory, which can explain uneven development. Findlay (1980) considers the case where the import elasticity is the same between the two regions, but the South is dependent on the North's demand for growth. In the long run, the growth rates of the two regions converge, but the gap in incomes remains and may even grow. Krugman (1981) and Matsuyama (1992) model knowledge spillovers specific to manufacturing as an explanation of North-South divergence if the South produces primary products and the North manufactures. Likewise, Chichilnisky (1993) argues that poor property rights cause the South to focus on primary production with decreasing returns. A common assumption to North-South modeling is that there is some initial condition that creates uneven development. For a full review of the theoretical and empirical history of North-South divergence, see Darity (2005).

Krugman (1989) asserts that elasticity ratios are determined by growth rates, and not the other way around. Therefore, they flip the causality of Thirlwall's Law. However, for a developing country whose exporting and domestic sectors are not integrated, I argue that the source

of this growth matters. If the source of the growth is the exporting sector, than the effect on elasticity ratios will be limited. There might be an expansion of exporting industries, but exporting and domestic sectors will remain unintegrated without improving the productivity of the latter. Therefore, import dependency will not be resolved and there will be no cumulative growth cycle. The current model, combines the endogenous elasticity ratios of Krugman (1989) with the exogenous ratios of Thirlwall (1979) and Dutt (2002).[2]

To our knowledge, this is the first model to formalize Lewis' and Nurkse's connection between internal production and uneven development in a BPCG model. Darity (1982) does produce an interesting model of a 'Lewis-Nurkse' world, but it is not BPCG. In Darity (1982), the South relies on the North for growth. A negative relationship between growth rates and income for the South drives uneven development. The way to escape is for the South to follow the Lewis-Nurkse balanced growth strategy, thereby fixing the negative relationship between income and growth. Also, Krugman (1994) uses Lewis' formulation to analyze the relationship between Southern and Northern growth, although he did not use internal production. Instead, Krugman (1994) depicts a world of three goods based on a technological level. The North produces high-tech goods, the South low-tech, and both medium-tech. It follows that the productivity level of the goods they both produce sets the terms of trade. So, in Krugman's (1994) illustration, a productivity improvement will only benefit the South if it is in the medium-tech sector as this will improve the terms of trade.

3   Model

The model follows Dutt (2002), except the North and South have the same production function and are supply constrained.[3] We also make three unique assumptions. First, the two

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[2]More recent empirical literature literature on elasticity ratios include Bölükbaşı and Civcir (2024) and Gregori and Giansoldati (2020).
[3]Nominal wages vary in the South, but distribution is held constant so prices rise equally with wages.

regions, North and South, export the same differentiated product, but the elasticity of demand for imports/exports are determined by growth of domestic productivity. Second, the South has workers in the informal sector, whereas the North does not. This is a simplified assumption as informal employment exists in all countries, but there is more in the South. The North operates on the frontier of domestic productivity, while domestic productivity of the South is kept low due to informal employment. Therefore, under these assumptions the Northern elasticity ratio is greater than the Southern, $\frac{\epsilon_N}{\epsilon_S} < 1$, where ϵ_N is the income elasticity of Northern exports (Southern imports) and ϵ_S is the income elasticity of Southern exports (Northern imports).

Third, we introduce a dynamic equation to explain the evolution of the elasticity ratio. Local consumption can be produced by the modern or the informal sector.[4] The key to raising formality and combating uneven development is improving internal productivity through government policy, as explained by Nurkse (1971) and Lewis (1978) 1980. Unlike Spinola (2020), there is a need for balanced growth between the modern and internal producing informal sectors. The former growing without the latter is equivalent to growth only in the exporting sector, which does not improve elasticity ratios. The model developed simultaneously determines elasticity ratios, terms of trade, and growth.

There are no intermediate goods, and both regions produce with fixed proportions of capital and labor. The two production functions, Y_S and Y_N, are the output of differentiated goods the modern sector produces in the two regions. We assume the informal economy does not trade and does not contribute to growth. The production functions are:

$$Y_S = K_S/a_S \tag{1}$$

$$Y_N = K_n/a_S \tag{2}$$

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[4]For the North, there is just the modern sector.

Where K_i and a_i are the capital stock and fixed capital-output ratio for the specific region, i. Northern produces set prices, P_N according to a markup formula:

$$P_N = (1 + z_N)W_N b_N \tag{3}$$

z is the given markup rate, W_N is the wage of the region, and b_i is the unit labor requirement. We assume these three variables are fixed. Each region has capitalists and workers. The Northern capitalist's share of income, or profit share, is σ_N. Using Equation 3, this takes a value of $z_N/(1 + z_N)$. Likewise, the wage share will be $1/(1 + z_N)$. In the South, the modern sector producers also set markup prices, P_S:

$$P_S = (1 + z_S)W_s b_S \tag{4}$$

W_S is the nominal wage. The capitalist share of income is $\sigma_S = z_S/(1 + z_S)$.

Northern capitalists and workers spend a portion α of their consumption on the Southern good and the rest in the North. For the South, workers and capitalists spend a portion β of their consumption on the Northern good.[5] In both regions, Capitalists can save s_i, but workers do not.

$$\alpha = \alpha_0 Y_N^{\epsilon_N - 1} P^{1 - \mu_N} \tag{5}$$

$$\beta = \beta_0 Y_S^{\epsilon_S - 1} (1/P)^{1 - \mu_S} \tag{6}$$

Equations (5) and (6), give the share of Northern and Southern spending, respectively, going to the other region. ϵ_i is the income elasticity of imports for each region, $P = \frac{P_S}{P_N}$ is the terms of trade[6], and μ_i is the price elasticity of imports for each region. Since the South has workers in

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[5]This is different from Dutt (2002), who assumes only capitalists spend money on the Northern good.
[6]I assume nominal exchange rate is fixed at 1

informality with low domestic productivity $\epsilon_S > \epsilon_N$.[7] Informality keeps internal productivity low and limits the domestic market. As the South grows, it will purchase a greater share of products from the North because it is constrained domestically. As incomes in the North grow, the South will not be able to respond as well to increased demand from the North if there are sections of the workforce in the informal economy. Without the ability to upgrade to new products or increase industry scale, the North will have to look elsewhere as their demand changes.

Equation (7) below gives the investment function for Northern firms. I_N is investment in the North, which is assumed to come solely from the northern good. For the South, Equation (8) shows the investment function, where $\zeta < 1$. Investment can be from the northern or southern good and equal to β of total investment. In both regions, capitalist savings is automatically channeled into investment.

$$\frac{I_N}{K_N} = \frac{s_N \sigma_N}{a_N} \tag{7}$$

$$\frac{I_S}{K_S} = P^\zeta S_s \tag{8}$$

We can yield equations for the value of southern (9) and northern exports (10):

$$P_S X_S = \alpha[(1 + (1 - s_N)z_N)/(1 + z_N)]P_N Y_N \tag{9}$$

$$P_N X_N = \beta[(1 + (1 - s_S)z_S)/(1 + z_S)]P_S Y_S \tag{10}$$

Then, by plugging Equation (5) into (9), (6), and (10) we get the following:

$$X_S = \theta_S P^{-\mu_N} Y_N^{\epsilon_N} \tag{11}$$

$$X_N = \theta_N (1/P)^{-\mu_S} Y_S^{\epsilon_S} \tag{12}$$

$\theta_S = \alpha_0[1 + (1 - s_N)z]/(1 + z)$ and $\theta_N = \beta_0[(1 + (1 - s_S)z_S)/(1 + z_S)]$ are both positive constants. Equations (11) and (12) show the quantity of exports from the South and the North.

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[7]This is the same as Dutt (2002), but the reasons are different.

Next, since Southern income is either consumed or invested, the excess demand function is $ED_S = X_S - M_S$. We know that $M_S = \frac{X_N}{P}$, plugging this into the excess demand function along with Equations (1),(2), (11), and (12) yields:[8]

$$P = \left[\left(\frac{\theta_S}{\theta_N}\right) \left(\frac{K_N}{a_N}\right)^{\epsilon_N} \left(\frac{a_S}{K_S}\right)^{\epsilon_S} \right]^{1/(\mu_N + \mu_S - 1)} \tag{13}$$

In the long run, the accumulation rate $g_i = I_i/K_i$ determines growth rates in the North and South. Northern growth rate is found in Equation (7). Savings in terms of the southern good is $S_S = s_s \sigma Y_S$. Combining this with Equation (8), we get the southern growth rate:

$$g_S = \frac{s_s P^\zeta \sigma_S}{a_S} \tag{14}$$

Through differentiation of Equation (13), we get the following term for the evolution of the terms of trade, which is the same as Dutt (2002):

$$\hat{P} = \left[\frac{1}{(\mu_N + \mu_S - 1)} \right] \epsilon_S \left(\frac{\epsilon_N}{\epsilon_S} g_N - g_S\right) \tag{15}$$

Equations (1) and (14) tell us that P does not affect northern growth rates but does alter growth for the South. For now lets assume $\frac{\epsilon_N}{\epsilon_S}$ is fixed at some level less than one so that we can directly compare with Dutt (2002). In the long-run $\hat{P} = 0$ so it must be the case that $\frac{\epsilon_N}{\epsilon_S} g_N = g_S$. Since we assumed the elasticity ratio to be less than 1, then at the steady-state of P, $g_N > g_S$. In other words, the North will grow faster than the South, and uneven development will occur due to low domestic productivity harming elasticity ratios. Figure (1) depicts the argument.

In the long run, prices will settle at P^* because this is where $\frac{\epsilon_N}{\epsilon_S} g_N = g_S$. At this point, $g_S < g_N$. The $\frac{\epsilon_N}{\epsilon_S} g_N$ line lies below the g_N because of relatively lower domestic productivity in the South. If the world started at a position of P_g, the two growth rates will be the same,

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[8]Marshall-Lerner condition holds so $\mu_N + \mu_S > 1$

Figure 1: Long-run Dynamics of P and g_i
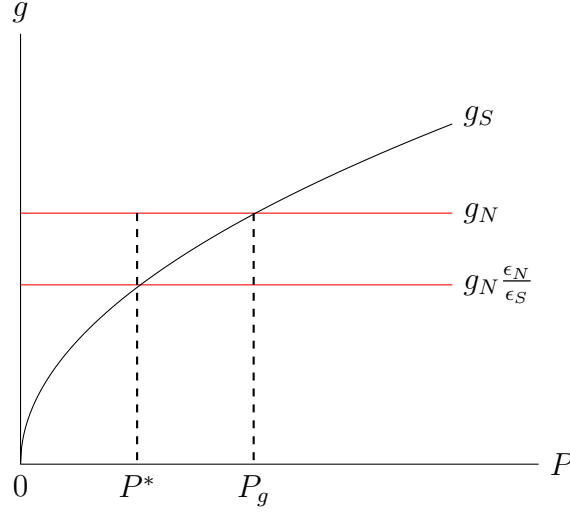
but $\frac{\epsilon_N}{\epsilon_S} g_N < g_S$ so prices will have to fall according to Equation (15). As prices fall, g_S will also fall because of Equation (14). Eventually, the world will settle at the steady-state P^*. Regardless of the starting point, P^* will be reached, and uneven development is inescapable.

3.1 Subsistence Productivity

Elasticity ratios are determined by the ratio of formal employment f to total employment N. Where $f = A/Y_S^\phi$ and N is total population so that there is zero unemployment. A is internal productivity, and $\phi < 1$ is a positive constant. The formal employment function highlights the importance of balanced growth across all sectors of the economy.

$$\frac{\epsilon_N}{\epsilon_S} = f/N \tag{16}$$

For a given A, a higher output of the formal sector, Y_S, requires more employment in the informal sector. However, because we assumed fixed proportions of capital and labor in formal production, Y_S can only rise if A rises proportionally with it so labor can be released from informality. Balanced growth is a relevant assumption because workers and capitalists rely on the internal product for some essential goods. Low domestic productivity limits purchasing

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power and weakens demand for other products. Nurkse (1971: 126), states "The rate at which any one industry can grow is inevitably conditioned by the rate at which other industries grow." Raising internal productivity releases workers into other sectors of the economy and improves the purchasing power of the country. The evolution of the elasticity ratio takes the following form, with the assumption that there is zero population growth:

$$\frac{\hat{\epsilon_N}}{\epsilon_S} = \dot{A} - \phi g_S \tag{17}$$

$\dot{A}$ signifies the growth in domestic productivity. Balanced growth requires internal productivity to grow proportionately to output growth in the long run. Next, I allow the government to tax the capitalist share of income at a rate of τ and use the tax revenue as investment for raising internal productivity. Let $\dot{A} = \tau^\psi \frac{s_s \sigma_s}{a_s}$ and $\psi < 1$, so that it domestic productivity grows with southern savings rate, government taxes, and capitalists share of income. Now, I attain the dynamic equations by plugging Equation (14) into (15) and (17), and implementing the tax:

$$\hat{P} = \left[\frac{1}{(\mu_N + \mu_S - 1)} \right] \epsilon_S \left(\frac{\epsilon_N}{\epsilon_S} g_N - \frac{(1-\tau)s_s P^\zeta \sigma_S}{a_S} \right) \tag{18}$$

$$\frac{\hat{\epsilon_N}}{\epsilon_S} = \tau^\psi \frac{s_s \sigma_s}{a_s} - \phi \frac{(1-\tau)s_s P^\zeta \sigma_S}{a_S} \tag{19}$$

We can solve these two equations for steady-state values of P and $\frac{\epsilon_N}{\epsilon_S}$. As the Mashall-Lerner condition holds, the steady-state will be asymptotically stable.[9] The steady-states, Equations (20) and (21), and corresponding phase-diagram, Figure (2), are shown below.

$$P_{ss} = \left(\frac{\tau^\psi}{\phi(1-\tau)} \right)^{\frac{1}{\zeta}} \tag{20}$$

$$\frac{\epsilon_N}{\epsilon_S}_{ss} = \frac{\tau^\psi s_s \sigma_s}{\phi a_s g_N} \tag{21}$$

Now, $g_{ss} = \frac{\tau^\psi s_s \sigma_s}{\phi a_s}$.

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[9]The trace of the Jacobian is negative, and its determinant is positive, as shown in the Appendix.

Equilibrium is reached regardless of the original values of $\frac{\epsilon_N}{\epsilon_S}$ and P. At the steady-state, $g_N > g_S$ just as before because $\frac{\epsilon_N}{\epsilon_S}_{ss} < 1$. In this model, informal employment harms domestic productivity which decreases the elasticity ratio and leads to unfavorable terms-of-trade. The terms-of-trade are then directly responsible for the uneven development of the North and South. Also, It must hold that $\dot{A} < \phi g_N$ if there is informal employment. In this model, the key to escaping uneven development is clearly through internal productivity growth, $\dot{A}$, by way of government taxes.

Figure 2: Phase diagram of P and $\frac{\epsilon_N}{\epsilon_S}$
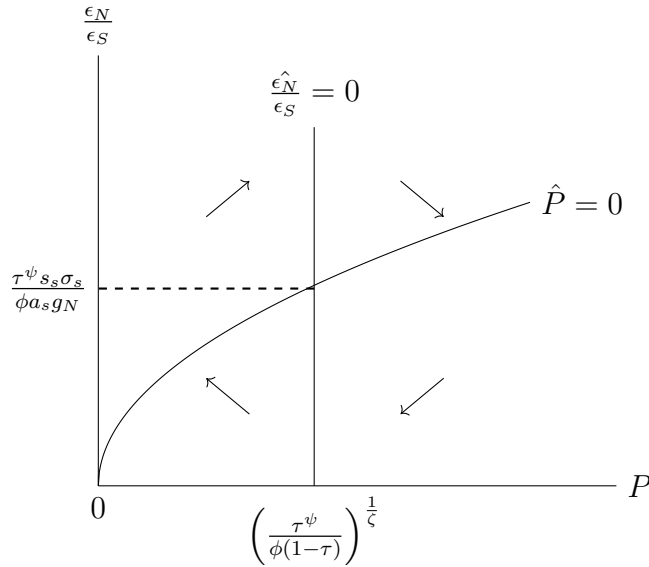
The phase diagram of Figure (2) depicts dampened clockwise oscillations until it reaches the steady-state point in the long run. There will be periods of favorable terms-of-trade to the right of the $\frac{\hat{\epsilon_N}}{\epsilon_S}$ nullcline, bringing the southern growth rate closer to that of the North. For example, starting at a position in the lower left quadrant with low levels of P and $\frac{\epsilon_N}{\epsilon_S}$ means the formal economy will grow because $\dot{A} > \phi g_S$. However, with a higher $\frac{\epsilon_N}{\epsilon_S}$, P will begin to grow, and now we are in the upper left quadrant. Over time, as P grows, $\frac{\epsilon_N}{\epsilon_S}$ will fall (upper-right), and eventually, both will fall (lower-right). The oscillation will restart but at a value closer to the

steady-state point.

In Equation (19), an increase in taxes τ, all else equal, will raise $\dot{A}$ and cause $\frac{\epsilon_N}{\epsilon_S}$ to be positive. In the long run, g_S will have to adjust to this new level of $\dot{A}$. The adjustment will happen through P according to Equation (18) because $\frac{\epsilon_N}{\epsilon_S}$ will be higher, so $\hat{P} > 0$. P and $\frac{\epsilon_N}{\epsilon_S}$ will rise, but the oscillations will begin and, eventually, reach the new steady-state at a point corresponding to a higher value of τ, $\dot{A}$, P_{ss} and $\frac{\epsilon_N}{\epsilon_S}{}_{ss}$. Using Equation (14), the rise in P will increase the growth rates of the South.

The situation is illustrated in Figure 3. The higher taxes increase $\frac{\hat{\epsilon_N}}{\epsilon_S}$ nullcline to $\frac{\hat{\epsilon_N}}{\epsilon_S}{}_1$ and lead to a new steady-state with both a higher P and $\frac{\epsilon_N}{\epsilon_S}$ as shown in the left panel of the figure. At the same time, there will be a upward shift in $\frac{\epsilon_N}{\epsilon_S}g_N$ to $\frac{\epsilon_N}{\epsilon_S}{}_1 g_N$ and a new equilibrium price at P_1. At the new price, g_S will be greater than g_N. It is not rare for Southern countries to go through periods of catching up to the North, the key is to sustain the growth of domestic productivity to overcome uneven development.
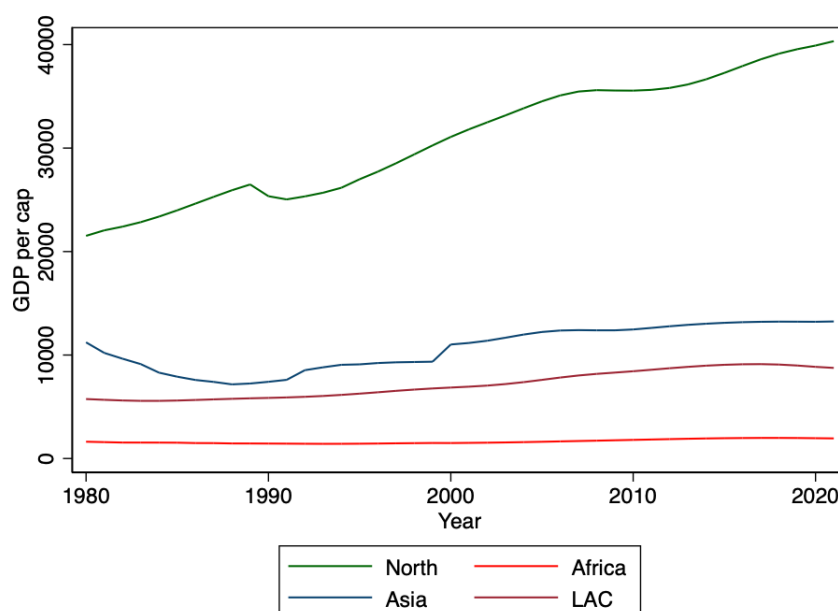
Figure 3: $\tau \uparrow$

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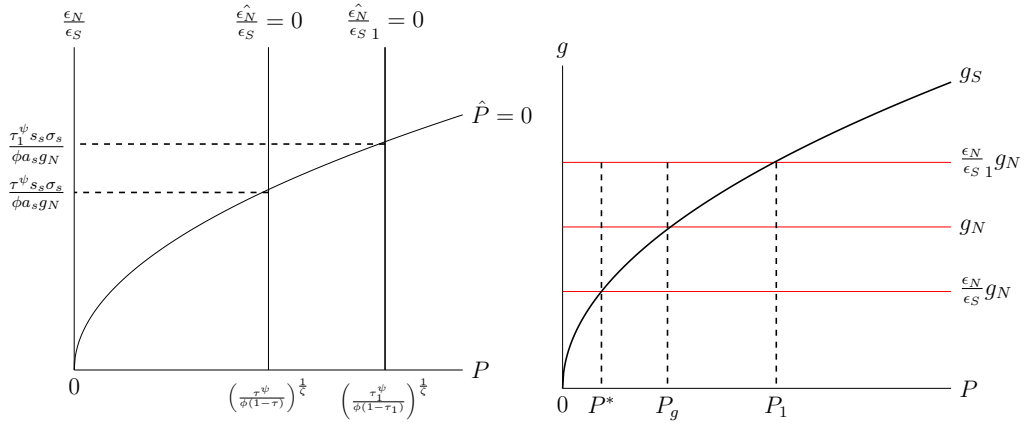
4 North vs. South

The importance of manufacturing exports has been well documented. However, it is not clear that the movement from agricultural to manufacturing exports is the solution to uneven development for the South. In this section, I present simple statistics as evidence of this skepticism. The data suggests that although the south is increasing its manufacturing share of exports, uneven development is still occuring.

Figure 4: income over time

Notes: Data on GDP is from the World Bank World Development Indicators (World Bank, 2023). The data were filtered using Hodrik-Prescott.

Figure (4) shows the change in income over time for the North and the South, split into three regions: Africa, Asia, and Latin America and the Caribbean (LAC)[10]. From 1980 to 2021, the income gap between the North and South increased. Asia has the highest income of the South and an average annual per capita growth rate of 2.5% from 1980-2021. As a region, Asia is the only one closing the gap on the North. Of course, this is an average and there are many

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[10]The regions are classified according to UNCTAD. We have a total of 121 countries. For a complete list of the breakdown, see Table (2) in the Appendix

countries within Asia that are not closing the gap. In comparison, the average annual per capita growth rate for African nations was 1.00%, LAC 1.36%, and the North 2.03% across 1980-2021, respectively.

The evolution of the dependence on primary product exports is in Figures (5) and (6)[11]. The former shows the share of primary products in total exports for the four country groups. The North has the lowest share of primary exports, which has been relatively constant over time. On the other hand, the regions of the South have seen a more pronounced decline in the share of primary exports. Therefore, the South has been diversifying its exports away from primary products.

Figure 5: Primary Export Shares
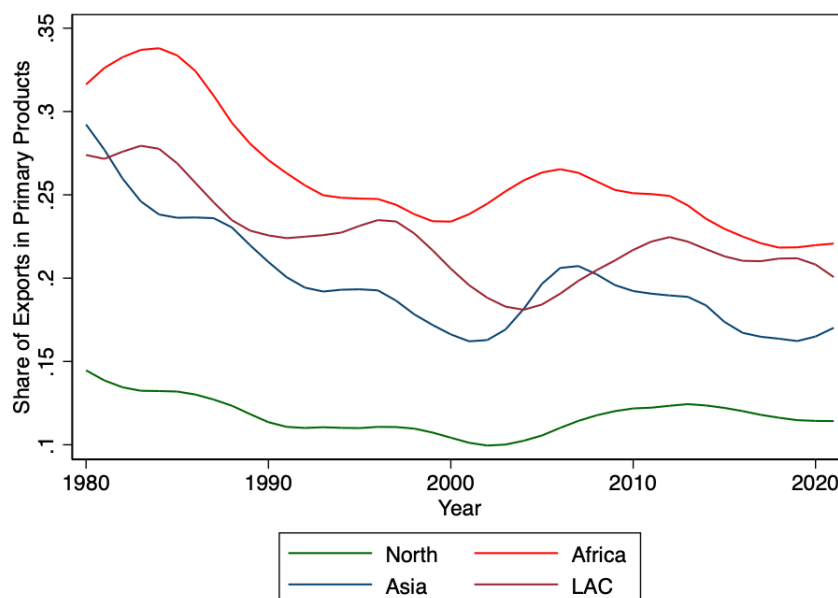
Notes: Trade data is from the Atlas of Economic Complexity (Atlas, 2022). The data was filtered using Hodrik-Prescott.

Figure (6) depicts net primary exports by direction. For Southern countries, it is trade with

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[11]Exports are classified according to UNCTAD. Primary products are the following SITC product categories: Food and live animals, beverages and tobacco, crude materials, animal and vegetable oils, mineral fuels, and non-ferrous metals

the North and vice-versa for the Northern countries. The measurement of net exports is exports divided by imports. The horizontal line is where net exports are equal to zero. Historically, the North has been an average net importer of primary products, but they are showing signs of reversing this trend. In 2021, they are right on the verge of becoming net exporters. The Southern regions have been decreasing their net exports of primary products. If the trend continues, they will soon become net importers. The world economy's production structure has been undergoing significant changes as the North and South alter their trade relationships. Figures (5) and (6) signify that the uneven development found in Figure (4) can not be fully explained by the South exporting primary products. If it were, the gap in income between the South and North would fall in accordance with the share of primary exports.

Figure 6: Net primary Export by Direction

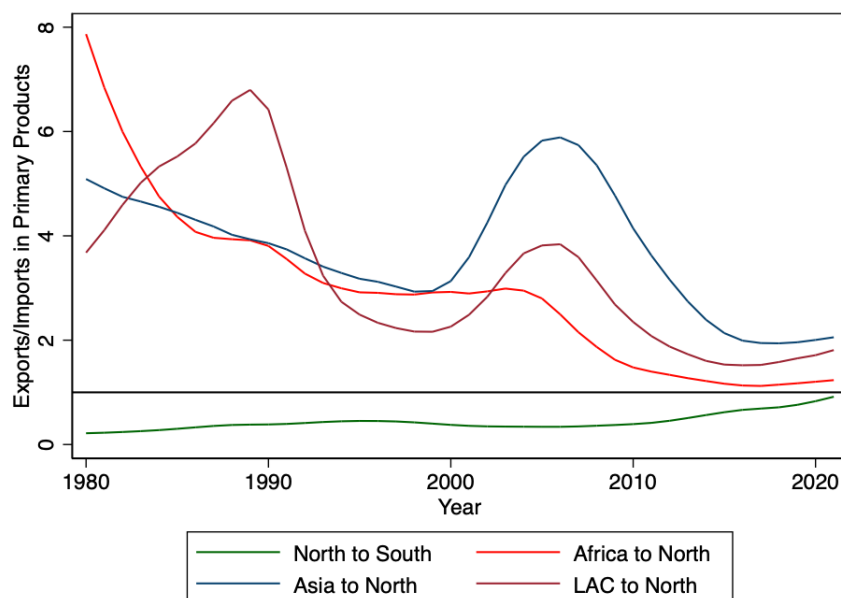*Notes*: Trade data is from the Atlas of Economic Complexity (Atlas, 2022). The data was filtered using Hodrik-Prescott.

Next, we illustrate the transformation of the informal economy in Figure (7) for 1990-2019. The informal economy is measured using the estimated share of informal output to total output. To no surprise, the North has the most minor informal sector. LAC and Africa had an informal

sector share of around 35% in 2019. They have seen some decline since 1990 but have yet to make significant strides to close their difference with the North. However, on average, Asia has had a notable decline in the informal sector, and its share is only 3% greater than the North in 2019.

Figure 7: Size of the Informal Economy
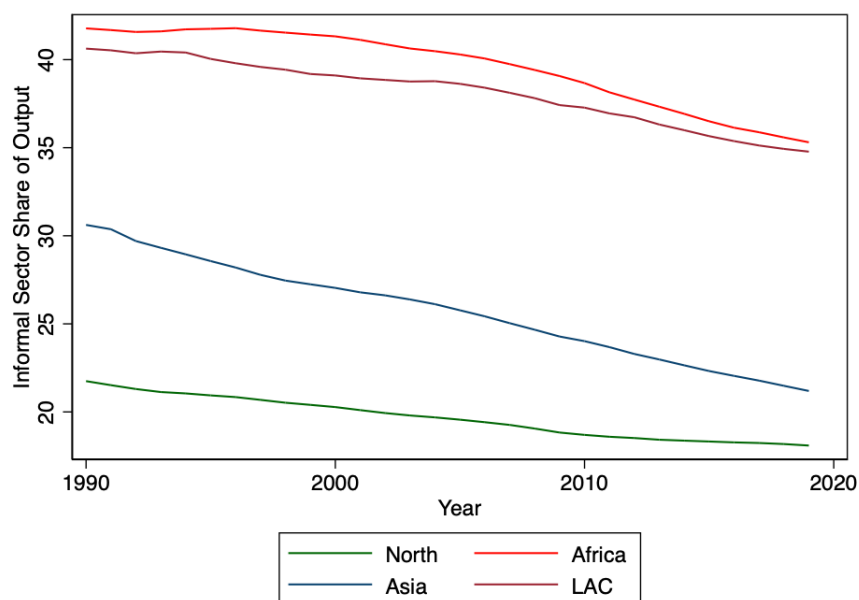
Notes: Informal economy is from the World Bank Informal Economy Database (Elgin et. al., 2021). We use the dynamic general equilibrium model-based estimates of informal output.

In all the figures, Asia has been the best-performing region of the South. They have the highest average incomes, most export diversification, and the smallest informal sector. In terms of export diversification, the South as a whole has been improving and catching up to the level of diversification of the North. Except for Asia, we have yet to observe a close in the gaps of income and the informal economy's size. If we only look at 1990-2021, Asia's growth rates are nearly 1% higher than the North. All the variables, exports, income, and informal sector, are undoubtedly endogenous, so reaching firm conclusions is challenging. The purpose of this section was to establish some stylized facts regarding the North and the South. The South has decreased its primary exports over time, but this has yet to translate into convergence.

Asia, the only southern region with a significant decrease in the informal sector, has also been converging in incomes with the North since 1980. We do not want to stretch the meaning of these observations to say that reducing the informal economy is the key to overcoming uneven development. However, we certainly can not rule it out.

5 Elasticity Ratios

I analyze the relationship between income growth, the informal economy, composition of exports, and elasticity ratios for 34 countries from 1985-2019. The estimation is modeled following Equations (22-24), where X_{it} and M_{it} are the total value exports and imports for each country, i, in in year t. $world\,GDP_t$ and GDP_{it} are constant GDPs in year t, where the former is the average of the world and the latter is the GDP of country i. RER is the real exchange rate, estimated using the Penn World Tables.[12] I then compute elasticity ratios by dividing income elasticity of demand for exports by imports, $ratio = \beta_1/\alpha_1$. This variable is used as the dependent variable in Equation (24), where I estimate determinants of elasticity ratios. $Avg.\,inf\,growth$ is the average growth in the share of total output produced by the informal sector for 1990-2019. $Avg.\,primary\,X\,growth$ is the average growth in the share of primary exports for 1985-2019. These two variables highlight the difference between Thirlwall's Law and Lewis' explanation of uneven development. Thirlwall's Law explains that primary products have a lower export elasticity of demand, while Lewis argues that a larger informal sector if detrimental to development. I also include a set of controls, $\mathbf{X}'$, which are average agricultural productivity growth for 1985-2019, avg growth in gross capital formation for 1985-2019, and average employment rate for 1985-2019.[13]

$$\ln X_{it} = \beta_0 + \beta_1 \ln worldGDP_t + \beta_2 \ln RER_{it} + \epsilon_{it} \qquad (22)$$

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[12]$RER = xr(export\,price/import\,price)$

[13]Trade data is from the Atlas of Economic Complexity (Atlas, 2022). Data on GDP is from the World Bank World Development Indicators (World Bank, 2023). Informal economy is from the World Bank Informal Economy Database (Elgin et. al., 2021). Agricultural productivity data is from the World Bank Development Indicators. Gross capital formation and employment data are from the Penn World Tables.

$$\ln M_{it} = \alpha_0 + \alpha_1 \ln GDP_{it} + \alpha_2 \ln RER_{it} + \epsilon_{it} \qquad (23)$$

$$\frac{\beta_1}{\alpha_{1\,i}} = \lambda_0 + \lambda_1 avg.\,inf\,growth_i + \lambda_2 avg.\,primary\,X\,growth_i + \mathbf{X}_i'\phi + \epsilon_i \qquad (24)$$

However, the models of Equations (22) and (23) are inappropriate for estimating long-run and short-run elasticities because of stationarity concerns. So, I estimate elasticity ratios for the 34 countries using an error-corrected autoregressive distributed dynamic panel specification (ARDL-ECM) (Pesaran and Smith, 1995; Pesaran, Shin, and Smith, 2001; Pesaran and Shin, 1999; Kripfganz, 2023). ARDL is a common model specification used by economists to estimate elasticity ratios.[14] I convert the ARDL into an error correction model. The advantage of this approach is it allows me to estimate short-run and long-run effects of the variables in question. It is well-specified as long as variables follow an I(0) or I(1) process. The models are shown in Equations (5) and (5).

$$\Delta \ln X_{ist} = \phi_0 + \sum_{j=1}^{P} \phi_{1j}\Delta \ln X_{ist-j} + \sum_{j=1}^{P} \phi_{2j}\Delta \ln worldGDP_{ist-j} + \sum_{j=1}^{P} \phi_{3j}\Delta \ln RER_{ist-j}$$

$$+\phi_4 \ln X_{ist-1} + \phi_5 \ln worldGDP_{ist-1} + \phi_6 \ln RER_{ist-1} + \epsilon_{it} \qquad (25)$$

$$\Delta \ln M_{ist} = \lambda_0 + \sum_{j=1}^{P} \lambda_{1j}\Delta \ln M_{ist-j} + \sum_{j=1}^{P} \lambda_{2j}\Delta \ln GDP_{ist-j} + \sum_{j=1}^{P} \lambda_{3j}\Delta \ln RER_{ist-j}$$

$$+\lambda_4 \ln M_{ist-1} + \lambda_5 \ln GDP_{ist-1} + \lambda_6 \ln RER_{ist-1} + \epsilon_{it} \qquad (26)$$

To examine the validity of the ARDL ECM, I first assess the stationarity properties of the variables with the Augmented Dickey-Fuller (ADF) unit root tests. The results are shown in Table (3) of the appendix and confirms the validity of our model since all variables follow an I(0) or I(1) process. Also in the appendix are the summary statistics for the first estimation where I find elasticities, Table (5) and for the second estimation where I find determinants for

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[14]For example, Bölükbaşı and Civcir (2024); Gregori and Giansoldati (2020).

the elasticity ratio, Table (6). The results for Equations (5) and (5) are also in the appendix in Table (4).

Figure 8: Elasticity Ratio by North/South
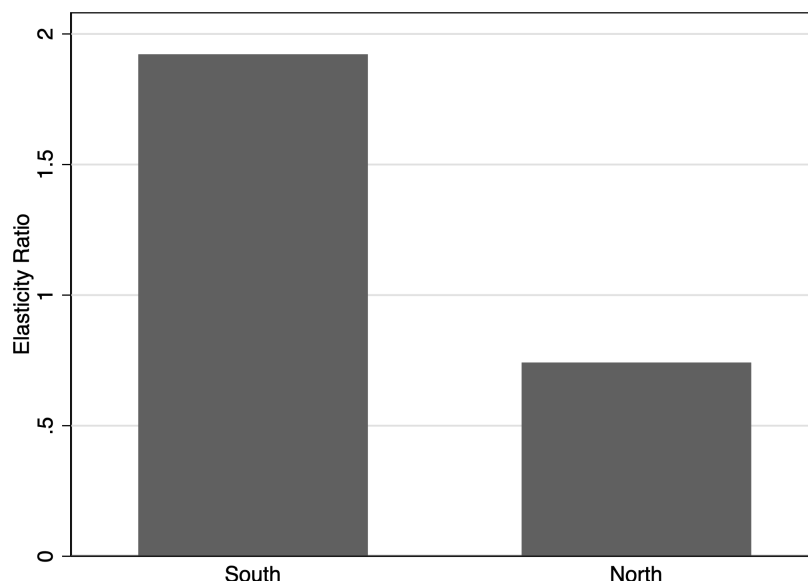
Notes: Figure shows elasticity ratios (income elasticity of exports/income elasticity of imports), separated by North and South, estimated for the years 1985-2019 using Equations (5) and (5).Trade data is from the Atlas of Economic Complexity (Atlas, 2022)

Interestingly, for our sample of countries, which includes 8 from the North and 26 from the South, Figure (8) shows that countries from the South have a higher elasticity ratio[15]. This suggests that their income growth rates should be higher than that of the North, due to an easing of the balance-of-payments constraint. The top-left panel of Figure (9) sheds light on this point, it shows that average income growth rates from 1985-2019 are positively correlated with the estimated elasticity ratio for this same period.

The top-right panel of Figure (9) shows that elasticity ratios are negatively associated with a

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[15]Countries from the North: Australia, Cyprus, Japan, the Netherlands, New Zealand, Portugal, Sweden, Switzerland. From the South: the Bahamas, Bangladesh, Cameroon, Chad, China, Comoros, Congo, Ecuador, Jordan, Madagascar, Morocco, Mozambique, Nicaragua, Peru, Rwanda, Saudi Arabia, Senegal, Sierra Leone, Suriname, Tunisia, Uganda, Uruguay, Vietnam, Zambia.

Figure 9: Elasticity Ratio Correlations
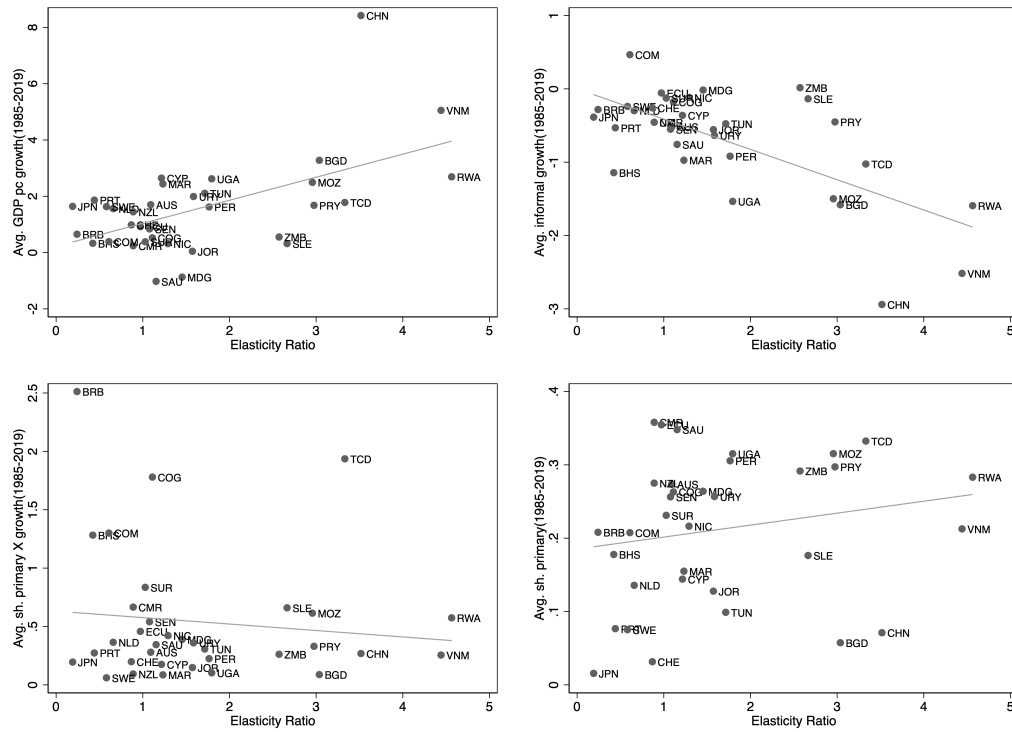
Notes: For each panel the x-axis is elasticity ratios for 1985-2019. The y axis for top-left is the average GDP growth for the period, top-right is average growth in the share of informal sector output, bottom left is average growth in the share of primary exports, and the bottom right is the average share of primary exports. Trade data is from the Atlas of Economic Complexity (Atlas, 2022). Data on GDP is from the World Bank World Development Indicators (World Bank, 2023). Informal economy is from the World Bank Informal Economy Database (Elgin et. al., 2021).

growth in the share of informal sector output. Countries in the South that are growing are likely to experience a fall in their share of informal output, so this result is not surprising. However, the important point from Figure (9) is that elasticity ratios are related to growth, and not levels of income. Therefore, it is vital variable for growth as argued by Krugman (1989) and Thirlwall (1979). Finally, the bottom panel of Figure (9) shows that there is not an association with elasticity ratios and average primary exports, in neither growth nor levels.

Table 1: Regressions of elasticity ratios

	Dependent variable is elasticity ratio (1985-2019)			
	(1)	(2)	(3)	(4)
avg. informal sector growth	-1.085***	-1.083***	-0.888***	-0.770**
	(0.206)	(0.313)	(0.247)	(0.286)
avg. sh primary export growth			-0.251	-0.403**
			(0.211)	(0.188)
avg. ag productivity growth			0.223**	0.255**
			(0.105)	(0.0945)
avg. gross capital formation growth			13.49**	8.184
			(4.997)	(4.778)
avg employment rate			-0.00127	-0.00145
			(0.000884)	(0.00109)
regional fixed effects		X		X
Constant	0.908***	0.464***	0.733***	0.435*
	(0.188)	(0.162)	(0.206)	(0.236)
Observations	34	34	34	34
R-squared	0.448	0.584	0.671	0.750

Notes: Robust standard errors in parentheses.*** $p<0.01$, ** $p<0.05$, * $p<0.1$. The table reports OLS results for Equation (24). The Dependent variable, elasticity ratio is income elasticity of exports divided income elasticity of imports. The elasticities are estimated for 1985-2019 with Equations (5) and (5). All of the independent variables are averages from this time period.

Table (1) shows the results of Equation (24). The relationship between elasticity ratios and the informal sector is statistically significant and negative in all four specifications. This estimation does not control for the variety of factors that might affect elasticity ratios, so the

results are imperfect. However, the argument for the importance of raising internal productivity to reduce the informal sector, can not be ruled out. Low internal productivity is related to the elasticity ratio because it decreases the range of outputs and increases dependency on imports. The amount of production of the country will be limited because of low productivity workers in the informal sector. These workers are 'trapped' in the sense that labor can not be mobilized appropriately when foreign demand picks up. Therefore, the limited domestic market also hinders the growth of exporting sectors. It harms the ability of the country to respond to foreign demand, especially if there are new tastes and preferences from trading partners, because labor is stuck in informality. Also, the lack of domestic demand means the exporting sectors are solely reliant on demand from elsewhere which causes volatility in the business cycles of these countries and prevents expansion. Lewis (1980: 562) states, "If a sufficient number of LDCs [Less Developed Countries] reach self-sustaining growth, we are into a new world. For this will mean that instead of trade determining the rate of growth of LDC production, it will be the growth of LDC production that determines LDC trade, and internal forces that will determine the rate of growth of production." For these reasons, low internal productivity decreases income elasticity of exports.

Next, low internal productivity increases the income elasticity of imports because it causes import dependency. The range of domestic production will be less than the range of domestic demand due to a limited local market. To fill this shortage, individuals will look to consume products from other countries. If incomes grow without internal productivity growing, than the import share of consumption will rise. The two effects on elasticities make low internal productivity harmful for the elasticity ratio.

This situation highlights the issue of disconnected export and domestic sectors. A rise in export demand should loosen constraints to the balance-of-payments, but if not accompanied by an increase in domestic productivity it might do the opposite. For example, in this case

it would be expected that income elasticity of exports rise. However, this increase will be limited because of the workers 'trapped' in informality. Also, this increase will be temporary as the increase in demand will eventually reverse. The problem is only made worse if export production is concentrated in a few industries. Nonetheless, a rise in export demand will likely raise incomes, but if domestic productivity is low than this extra demand will go toward foreign products. Then, a probable result is a rise in income elasticity of imports. An integrated domestic and export sectors is when each are purchased locally for either consumption or as intermediate goods for the other sector. Under these circumstances, then a rise in export demand can help the domestic sector through spillover effects and not lead to deterioration of elasticity ratios. Nurkse (1971: 126) states: "Balanced growth, as a means of enlarging the market and stimulating the incentives for higher productivity through capital investment, is an essential basis for expanding trade."

6   Conclusion

In the *Janeway Lectures* (Lewis, 1978), Arthur Lewis predicted the South would become net importers of primary products over time and continuously increase their exports of manufactured goods. The reason is the shortage of unskilled manufactured laborers in the North. To combat this, the North will invest capital in poorer nations to produce low-wage manufacturers for import. We have shown in Section 4 that Lewis's prediction is trending to be correct, but this has not solved the problem of uneven development. Once divided among primary and manufactured exporters, the world order would be transformed. "The ending of this division exposes the fallacy of the belief that the division [between North and South] was based on unfavorable terms of trade for agriculture as against industry. If 60 percent of the tropical labor force is in low-productivity food, the rest of the labor force will get low prices whether it exports agricultural or industrial products" (Lewis (1978): 36).

The model developed in this article assumes no differences in the products exported between the North and South. Even so, uneven development is the long-term outcome. The North attains higher growth their internal production is done in modernity. Furthermore, a large informal sector harms the South. They become dependent on imports from the North and are not equipped to respond to increased foreign demand for their products. Elasticity ratios move unfavorably for the South and terms-of-trade deteriorate in the long run. These factors force BP equilibrium to become constrained and uneven development to occur.

The South needs to raise domestic productivity to close the income gap between the two regions. In doing so, wages and prices for exported products will rise, and workers will be released from the informal sector so that the domestic market will grow, leading to less import dependency. Thus, the constraint due to BP equilibrium will be looser, and catching up to the North will be possible. Increasing internal productivity involves strategic action by economic agents and the state. The first step is to target the areas of concern. That is the location of the informal economy and internal production. A large portion will likely be in the rural areas, but there will also be street vendors and such in urban regions. The next step involves implementing extension and learning programs in these areas of concern. For example, upgrading tools and techniques of production, and updating transportation routes and methods so the products can more easily reach the consumer. The line between informality and formality is blurred, and for our purposes, it is irrelevant. What matters is increasing the productivity of the domestic economy, regardless of whether that means transforming the informal sector into a modern one or not.

The expansion of Northern investment to the South has not solved uneven development as it does not enhance the internal economy of the South. In some instances, it might worsen uneven development by diverting attention away from the internal economy. Many of the exporting sectors of Southern countries are set up through these investments and become enclaves with

no ties to the domestic economy. They make products solely for foreign consumption, and much of the money spent by foreigners does not find its way back into the economy. Integrating the domestic and export sectors is another step to overcoming uneven development for the South.

The current model only scratches the surface of research that needs to be done about the issue. We only briefly discussed ways to increase internal productivity, and in our model, we assume it can just happen. In reality, there needs to be a plan, and, of course, it will involve money. An extension to this model would be to use southern profits as investment toward local industry to improve its productivity. The relationship between internal production, the informal economy, and uneven development must also be further analyzed. More empirical work is needed to confirm the arguments outlined in this article. Also, I have not analyzed the distributional effects from elasticity ratio movements. An useful extension could do just that and connect the distributional changes with different demand-led regimes.

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7 Appendix

$$J = \begin{bmatrix} -\frac{\zeta}{\mu_N+\mu_S-1}\left[\frac{(1-\tau)\epsilon_S s_S \sigma_S P^{\zeta-1}}{a_S}\right] & \frac{1}{\mu_N+\mu_S-1}g_N \\ -\zeta\phi\frac{(1-\tau)s_S\sigma_S P^{\zeta-1}}{a_S} & 0 \end{bmatrix}$$

$$Tr < 0, Det > 0$$

Table 2: Country Categories

Africa	Asia	LAC	North
Algeria	Bahrain	Argentina	Albania
Angola	Bangladesh	Bahamas, The	Australia
Benin	China	Barbados	Austria
Burkina Faso	India	Belize	Belgium
Burundi	Indonesia	Bolivia	Bulgaria
Cameroon	Iran, Islamic Rep.	Brazil	Canada
Chad	Jordan	Chile	Cyprus
Comoros	Kuwait	Colombia	Denmark
Congo, Dem. Rep.	Lebanon	Costa Rica	Finland
Congo, Rep.	Malaysia	Dominican Republic	France
Cote d'Ivoire	Maldives	Ecuador	Germany
Egypt, Arab Rep.	Mongolia	El Salvador	Greece
Ethiopia	Myanmar	Guatemala	Hungary
Gabon	Nepal	Guyana	Iceland
Gambia, The	Oman	Haiti	Ireland
Ghana	Pakistan	Honduras	Israel
Guinea	Philippines	Jamaica	Italy
Kenya	Qatar	Mexico	Japan
Liberia	Saudi Arabia	Nicaragua	Korea, Rep.
Madagascar	Singapore	Panama	Malta
Malawi	Sri Lanka	Paraguay	Netherlands
Mali	Syrian Arab Republic	Peru	New Zealand
Mauritania	Thailand	St. Lucia	Norway
Mauritius	Turkiye	St. Vincent & the Grenadines	Poland
Morocco	United Arab Emirates	Suriname	Portugal
Mozambique	Viet Nam	Trinidad and Tobago	Romania
Nigeria		Uruguay	Spain
Rwanda			Sweden
Senegal			Switzerland
Sierra Leone			United Kingdom
South Africa			United States
Sudan			
Tanzania			
Tunisia			
Uganda			
Zambia			
Zimbabwe			

Table 3: Dickey Fuller Unit Root Test

countrycode	df_import	df_GDP	df_RER	df_dGDP	df_dimport	df_dRER	Level	FirstDiff
AUS	-1.656944	-1.598423	-2.509476	-5.215638	-3.395428	-3.306602	I(1)	I(0)
BGD	-2.219184	.7041931	-2.272477	-3.24674	-4.392202	-5.043173	I(1)	I(0)
BHS	-1.331766	-2.696048	-3.901434	-4.538834	-2.008	-5.279181	I(0)	I(0)
BOL	-2.320611	-3.4502	-4.942049	-2.256852	-3.920747	-3.016801	I(0)	I(0)
BRB	-1.653803	-3.009898	-2.55376	-3.701296	-2.886762	-3.999959	I(1)	I(0)
CHE	-2.485235	-2.802083	-2.477255	-4.249	-3.308873	-3.842216	I(1)	I(0)
CHN	-1.625423	-1.108829	-1.714387	-3.0279	-3.295164	-3.329803	I(1)	I(0)
CMR	-2.253299	-2.516663	-2.046502	-2.42896	-3.719274	-3.254477	I(1)	I(0)
COG	-1.827904	-2.343333	-2.161628	-3.492585	-1.841217	-3.433757	I(1)	I(0)
COM	-2.414679	-1.31155	-2.498006	-3.359045	-3.804426	-4.469252	I(1)	I(0)
CYP	-1.129436	-1.859258	-2.528309	-2.592667	-3.311533	-3.752051	I(1)	I(0)
DOM	-2.022922	-2.431059	-2.02261	-4.50957	-4.108448	-4.172699	I(1)	I(0)
ECU	-2.452287	-2.056343	-3.6999	-2.587994	-3.46175	-5.617939	I(0)	I(0)
JOR	-2.318669	-2.926016	-1.666417	-3.240858	-2.519978	-4.426471	I(1)	I(0)
JPN	-2.00944	-2.576062	-1.93279	-2.885397	-4.065511	-4.842996	I(1)	I(0)
MAR	-2.600996	-1.72352	-4.563172	-2.567408	-3.177225	-3.689162	I(0)	I(0)
MDG	-3.181397	-1.95589	-1.938785	-4.307318	-5.001463	-4.146023	I(1)	I(0)
MOZ	-2.624739	-4.957395	-1.234517	-3.226154	-3.610324	-3.667772	I(1)	I(0)
MUS	-1.981878	-.719028	-2.182521	-4.69863	-3.835737	-4.081726	I(1)	I(0)
NIC	-2.060607	-2.384784	-2.51359	-2.129095	-4.135336	-3.093826	I(1)	I(0)
NLD	-1.594479	-1.136274	-2.099276	-3.099205	-3.707224	-3.772403	I(1)	I(0)
NZL	-2.67952	-2.604125	-3.225414	-2.66843	-3.615054	-3.603631	I(0)	I(0)
PER	-3.328794	-2.292156	-1.810019	-3.624365	-3.540287	-3.197119	I(1)	I(0)
PRT	-1.538643	-1.58596	-4.082104	-2.792499	-3.205868	-3.806357	I(0)	I(0)
PRY	-2.275599	-2.046451	-1.621669	-2.489237	-2.767782	-5.081196	I(1)	I(0)
RWA	-1.692385	-1.282865	-1.690377	-3.848273	-3.275605	-4.059151	I(1)	I(0)
SAU	-2.76623	-4.890316	-3.77094	-4.214175	-3.579264	-5.564115	I(0)	I(0)
SEN	-2.359062	-1.001326	-1.973831	-2.963843	-3.403162	-3.071212	I(1)	I(0)
SLE	-2.592965	-1.311767	-2.132119	-3.275283	-3.648249	-3.265745	I(1)	I(0)
SUR	-3.177584	-2.08407	-.9646749	-2.079144	-2.866146	-3.404537	I(1)	I(0)
SWE	-1.965765	-2.061694	-2.999768	-3.357563	-3.785907	-4.222684	I(0)	I(0)
TUN	-1.855592	-.2237822	-1.13098	-3.28825	-2.971633	-3.88306	I(1)	I(0)
VNM	-1.940581	-2.482424	-2.243433	-2.980882	-3.151906	-3.356026	I(1)	I(0)
ZMB	-2.889776	-1.965594	-1.734783	-1.600344	-3.798626	-3.23154	I(1)	I(0)

Table 4: Elasticities by Country

code	export elasticity	import elasticity	SE	p-val	N	R-sq.
ZMB	4.590367	1.784504	.5980872	4.96e-08	35	.6664048
ZAF	3.367026	0	.3987584	4.68e-09	35	.6116769
VNM	5.634388	1.268671	.1429189	9.60e-27	35	.832706
URY	2.736264	1.726449	.4342989	1.14e-06	35	.6224613
UGA	3.727338	2.076493	.417693	8.18e-10	35	.5481967
TUN	4.007614	2.337551	.7077656	4.04e-06	35	.6711189
TCD	5.239069	1.572705	.6636008	8.23e-09	35	.3189542
SWE	1.33383	2.29733	.5025081	.0127655	35	.7611427
SUR	3.10995	3.025747	.5212196	1.53e-06	35	.2584219
SLE	3.11837	1.170184	1.113064	.0086837	35	.2249295
SEN	2.671723	2.479365	.0934298	7.59e-24	35	.4965669
SAU	2.25973	1.959137	.5537729	.0002918	35	.1800839
RWA	6.405178	1.403589	1.357462	.0000481	35	.2910608
PRY	3.600213	1.210051	.494942	3.49e-08	35	.2389544
PRT	1.624513	3.686169	.4121736	.000469	35	.7779837
PER	3.634061	2.059076	.3932881	5.35e-10	35	.5935025
NZL	1.770342	1.991911	.1219119	2.81e-14	35	.7075799
NLD	1.71454	2.604117	.282344	1.31e-06	35	.6451254
NIC	3.111578	2.410497	.5290397	2.52e-06	35	.5053523
MUS	0	1.414286	.922099	.1884186	35	.5756564
MOZ	4.731176	1.600139	1.203671	.0004828	35	.334559
MDG	2.598568	1.78741	.3477018	2.03e-08	35	.3773454
MAR	2.569386	2.085667	.0625876	1.37e-28	35	.6463819
KEN	2.159355	0	.3290142	2.50e-07	35	.2420235
JPN	.784457	4.119748	.1488475	.000012	35	.6470082
JOR	2.95412	1.8786	.468851	6.03e-07	35	.3402308
IDN	2.645886	0	.2935819	1.76e-09	35	.6622319
GTM	1.542014	0	.2543209	2.92e-06	35	.7265835
ECU	2.695727	2.773271	.4067929	2.45e-07	35	.2544983
DOM	0	.9058228	.701883	.8063758	35	.3935422
CYP	2.421042	1.991981	.2127248	1.34e-12	35	.3478763
COM	1.494305	2.455216	.3408163	.0001242	35	.2532866
COG	3.842983	3.460268	.5863907	3.00e-07	35	.316997
CMR	1.735128	1.95108	.2909173	1.54e-06	35	.48417
CHN	5.25121	1.493041	.2733874	8.40e-15	35	.8647878
CHE	1.441949	1.661325	.1638957	8.27e-10	35	.6865543
BRB	1.276829	5.293211	.3372394	.0006595	35	.252879
BOL	0	1.690639	8.289659	.9140952	35	.3032173
BHS	2.016017	4.766421	.5997347	.0020721	35	.2145746
BGD	4.210871	1.386514	.4972778	2.27e-08	35	.7283763
AUS	2.265847	2.075631	.1246401	2.15e-17	35	.6852928

Table 5: Summary Statistics

variable	mean	SD	N	min	max
ln import	22.442	2.11	1640	17.088	28.212
ln world GDP	26.661	.334	1640	26.042	27.239
ln own GDP	24.321	2.013	1634	19.798	30.291
ln export	22.181	2.373	1640	16.092	28.58
informal sector share of GDP	30.779	12.991	1230	7.984	66.417
ln RER	2.576	3.673	1640	-19.625	10.073

Table 6: Summary Statistics

variable	mean	SD	N	min	max
ratio	1.644	1.162	34	.19	4.563
avg. informal sector growth	-.677	.692	38	-2.94	.466
avg. sh primary export growth	.522	.547	38	.06	2.512
avg. ag productivity growth	.862	1.598	38	-3.109	4.239
avg. sh gross capital formation growth	.019	.032	38	-.026	.086
avg. employment rate	28.636	113.902	38	.117	703.365