

TEXTO PARA DISCUSSÃO N° 166

NOTES ON TRADE AND GROWTH

Frederico G. Jayme, Jr

Outubro de 2001

JEL Classification: F4, O4

Ficha catalográfica

339.5	Jayne Jr., Frederico Gonzaga
J42n	Notes on trade and growth. / por Frederico Gonzaga Jayme Jr.
2001	Belo Horizonte: UFMG/Cedeplar, 2001. 25 p. (Texto para discussão ; 166)
	1. Relações econômicas internacionais 2. Comercio exterior 3. Balanço de pagamentos 4. Desenvolvimento econômico.. I. Universidade Federal de Minas Gerais. Centro de Desenvolvimento e Planejamento Regional. II. Título. III. Série.

**UNIVERSIDADE FEDERAL DE MINAS GERAIS
FACULDADE DE CIÊNCIAS ECONÔMICAS
CENTRO DE DESENVOLVIMENTO E PLANEJAMENTO REGIONAL**

NOTES ON TRADE AND GROWTH

Frederico G. Jayme, Jr

E-mail: gonzaga@cedeplar.ufmg.br

Address: Rua Curitiba 832/904

Belo Horizonte – MG 30170-120 - Brazil

Phone: 00xx31 3279-9154

Economics department, Universidade Federal de Minas Gerais and Cedeplar/UFMG.

I would like to thank Janine Berg, Will Milberg, Fabiana Santos,
Anwar Shaikh, and Chris Weller for helpful comments

**CEDEPLAR/FACE/UFMG
BELO HORIZONTE
2001**

SUMÁRIO

1. INTRODUCTION	7
2. OLD AND NEW MODELS OF TRADE AND GROWTH	9
2.1. Earlier Models of Welfare Gains of Trade	9
2.2. Trade and Growth in the New Endogenous Growth Models	13
3. TRADE AND GROWTH IN THE KEYNESIAN TRADITION	16
4. CONCLUSIONS	21
5. REFERENCES	22

Abstract

The theoretical and empirical connections between economic growth and trade have been discussed in economics for a long time. This link, however, has been proved empirically to be weak, as there is little evidence about the role of trade in economic growth and development. Taking into consideration this fact, the aim of this paper is to study the relationship between trade and growth. The central question to be addressed is the causal relation running from trade to growth, or, more specifically, the theoretical relationship between trade and growth. Two aspects will be taken into consideration, namely, the relationship between trade and growth and Balance of Payments problems and their relation with macroeconomic policy. The theoretical literature used in this paper will analyze the channels between trade and growth in both directions. The purpose is to assess the causality running from trade to growth.

1. INTRODUCTION

The aim of this paper is to analyze critically the relationship between trade and growth, an essential aspect of any theory of development. Although this connection has been made in several works relating this topic, both theoretical and empirical, the association between them is difficult to be established. The growth literature leads to problems such as the endogeneity of the variables whereas empirical policy literature has been proved to be weak in trying to make a clear correlation between openness and growth.¹ Although long-run economic growth and technological progress seem to lead to changes in the pattern of international trade, these effects are far from being conclusive. Moreover, an accurate analysis of economic growth has to include all the determinants of economic growth, in which capital stock, and investment play a central role. Indeed, investment is the only variable in which there is broad consensus as determinants of growth. The influences of trade on the quantity and quality of investment, however, remain as a puzzle.

The question to be addressed in this paper is the relationship between trade and growth in theoretical literature since earlier models of welfare gains of international trade. An assessment of the literature will be done in order to find how it works, if works, the link between trade and growth. It seems difficult to make this connection without to make an analysis of investment as the most important macro factor to foster economic growth.

The origins of the theoretical literature about trade and growth are absolute and comparative advantage, as well as the Heckscher-Ohlin model and their followers. Although some models find that growth can affect patterns of international trade, there is no clear evidence about the causal relation between these variables. Empirical literature relating trade and growth has been dedicated to assess the pattern of trade policy on growth, basically trying to find a causal relationship between openness and growth, or more specially, if trade causes growth². Some authors try to demonstrate that open economies tend to converge faster to steady state growth than the close ones. (Sachs and Warner, 1995; Edwards, 1992, 1993, 1998; Srinivasan and Bhagwati, 1999; Krueger, 1997; Ben-David and Kimhi, 2000). Others have found that openness can prevent economic growth due to the harmful effects on infant industries, or due to balance-of-payments constraint, in a demand-led approach. Empirical evidence in several countries, mainly in developing ones, seems to support these studies. (Taylor, 1993; McCombie and Thirlwall, 1999; Blecker, 1999b; Helleiner, 1996; UNCTAD, 1995). Still, others are skeptical about the power of openness in pushing up economic growth even using similar methodology that those who

¹ Thirlwall (1979), McCombie and Thirlwall (1994), Blecker (1992), Edwards (1992), Edwards (1998), Frankel and Romer (1999), Fitzgerald and Perosino (1996), Grosman and Helpman (1990), Harrison (1996), Harrison and Hanson (1999), Ocampo and Taylor (1998), Rodrik (1999), Rodriguez and Rodrik (1999), Sachs and Warner (1995), Taylor (1993), Srinivasan and Bhagwati (1999).

² The concept of openness that is utilized here relates to the absence of restrictions on flows of goods and capital across national borders. It is important, thus, distinguish to outward-orientation. The latter is related to the idea that world markets is an outlet for domestic markets. Therefore, outward-orientation can be accompanied by restriction of imports, whereas in the former import barriers have to be curtailed.

advocates the benefits of opening up to growth. (Rodriguez and Rodrik, 1999; Rodrik, 1999; Harrison and Hanson, 1999)

Keynesian models in Kaldorian lines, such as Thirlwall's Balance-of-Payments constrained growth (BOP) model, find the channel between trade and growth by means of demand-pull characteristic of exports³. Trade represents an important constraint to economic growth by means of balance of payments problems. Static trade models suggest that movements toward openness can temporarily increase the rate of growth due to short-run gains from the reallocation of resources, which would imply a positive relationship between changes in openness and GDP growth. The new growth literature also identifies a number of avenues through which openness might affect long run growth.⁴ Some of these channels are technological change and technological gaps. The idea behind this statement is that countries, which are more backward and provide more opportunities to absorb new ideas, will converge faster to international norms, allowing them to benefit from technological change. (Harrison and Hanson, 1999).

Endogenous growth models have found in Total Factor Productivity (TFP) and the accumulation of knowledge channels to relate trade (in the form of openness) and growth. Basically, participation in world markets and importation of technology can lead to faster growth in the long run. Grossman and Helpman (1990, 1991), on the one hand, highlight that in a theoretical framework the relationship between opening up to trade and long run growth is in fact ambiguous. Therefore, for them, trade does not necessarily lead to faster growing. Empirically, on the other hand, these connections are far from conclusive. In contrast, some cross-section and time series/cross-section econometric studies presented different result and, in some cases, divergent results regarding these connections. (Hanson and Harrison, 1999, Rodriguez and Rodrik, 1999).

This paper is organized as follows. In the second section I will treat the neoclassical and endogenous growth view about trade and growth. In dealing with trade, the starting point is to discuss the traditional Ricardian and Heckscher-Ohlin-Samuelson models of gains for trade, as well as Bhagwati's immiserizing growth. Although these models and Heckscher-Ohlin-Samuelson models of gains from international trade do not relate directly with growth in their earlier versions, new models using endogenous growth depart in general from these models, which became important to analyze them critically.

The third section deals with alternative views about trade and growth. Export-led growth and import-substitution strategy will be studied in order to analyze the main features and similarities among these approaches to deal with trade and growth. Special attention will be taken to developing countries. The fourth section is dedicated to concluding remarks, where I will make a critical assessment of the relationship between trade and growth.

³ Thirlwall (1979) and McCombie and Thirlwall (1994, 1997).

⁴ See, for the special relationship between trade and growth using Endogenous Growth models, Grossman and Helpman (1990) and Grossman and Helpman (1991). See, also, for an empirical estimation of economic growth across countries Barro (1997).

2. OLD AND NEW MODELS OF TRADE AND GROWTH

2.1. Earlier Models of Welfare Gains of Trade

The starting point for a discussion of trade is the theory of Comparative Advantage. According to that, trade allows a more efficient use of the economy's resources by enabling imports of goods and services that could otherwise only be produced at home at higher resource costs. For instance, trade enables developing countries to import capital and intermediate goods – critical to long-run economic growth – that would be quite expensive to produce locally.

The traditional case for the gains of trade is based on comparative advantage, in which a country that opens up can be assured the benefits of welfare gains in a static model. The Ricardian model explains the welfare gains if any country specializes in producing goods in which it has a comparative advantage⁵. The Heckscher-Ohlin-Samuelson (H-O-S) model, on the other hand, shows the welfare gains in the two-country model that each country specializes based on their factor endowments. The keystone of these theories is that international trade is the way to achieve static productivity efficiency and international competitiveness. Recall that economic growth is only a result of this strategy. Although productivity efficiency and international competitiveness can be achieved, it is not clear, under the Ricardian or the H-O-S model, whether and how international trade determines economic growth in the long run.

The Ricardian model assumes two countries, two commodities and that all factors of production can be reduced to a single one, that is, labor. Besides, the production of each commodity is carried out according to fixed technical coefficients. Technology explains, thus, the pattern of international trade. Assuming absent costs of transportation, the condition for international trade to take place is the existence of differences between comparative costs in production of both goods in both countries. Even if one country has absolute advantage in costs of production in both goods, international trade is an option better than autarky. Since both conditions are satisfied, if each country specializes in commodities they have less comparative cost, and engage in international trade, the welfare of both economies and, also, the world welfare will improve.

This simple static model representing the efficiency gains of international trade is widely discussed in international trade textbooks and it is not necessarily to restate it here⁶. The basic aspect to take into consideration is the fact that having different comparative costs and different terms of trade, international trade will better off both countries in comparison with autarky. The condition stated in Ricardian static argument and the Viner (1937) version of the model shows that there is an improvement in income and welfare when countries engage in international trade. The textbook version of this model points out how international trade allows countries to go beyond the Production Possibility Frontier and

⁵ For a dynamic version of the Ricardian model see Findlay (1984).

⁶ See Gandolfo (1994) for a textbook version of the Ricardian model.

shows a basket of goods that neither country could obtain in autarky. Findlay (1984), however, presents a dynamic Ricardian model in which trade reduces the rate of growth. His model departs from a simple dynamic model relating wage-fund, the natural wage rate, the fixed supply of land and the two constant returns to scale production function to obtain a production possibility frontier.

Findlay (1984)'s model indicates that trade reduces the rate of growth, in comparison with autarky, in any country which exports agricultural goods and imports industrial one, due to the fact that the rise in rents is absorbed by luxury consumption whilst the fall in the rate of profit reduces accumulation. North-south models of trade follow this version of dynamic Ricardian model, in which free trade hurts growth in underdeveloped/agricultural countries. They show the inverse relationship between free trade and alternative models, such as center-periphery, and gap models.⁷

The basic Heckscher-Ohlin (H-O) model identifies the difference in factor endowments as the cause of trade. More specifically, following the H-O theorem, in a two-country model, each country exports the commodity that uses the country's more abundant factor more intensively. The H-O model, however, sustains itself under some restrict assumptions essentials for its validate. These assumptions, however, show the weak empirical verification of the model in its static version. The first assumption states that production functions exhibit positive, but decreasing, returns to each factor and constant returns to scale. The two goods exhibit different production functions, since otherwise there are no different goods. This first assumption is, as well known, basic in neoclassical argument. The second assumption states that the structure of demand is identical in both countries, which means that the two goods are consumed at any given relative prices and independent of the level of income (this the case of homothetic utility functions). Finally, the third basic assumption is that factor-intensity reversals are excluded.⁸

A corollary of the H-O theorem is the Factor Price Equalization theorem, which states that prices equalize across countries under international immobility of factors. Therefore, under the assumptions above described, countries that engage in international trade in the fashion of the H-O model improve welfare, income and change the income distribution across countries, by means of a best allocation of factors in comparison to autarky.⁹

The Stolper-Samuelson theorem leads to the generalization of H-O model (the so-called Hecksher-Ohlin-Samuelson model). The Hecksher-Ohlin-Samuelson (H-O-S) model analyses the consequences of international trade on employment and income distribution¹⁰. Following this model, international trade leads to a higher Pareto-efficient equilibrium by means of reallocation of resources

⁷ Findlay (1984) also presents Lewis model of the terms of exchange and unequal exchange models as sub sets of the dynamic Ricardian model.

⁸ Under factor intensity reversal it is impossible to choose unambiguously the rank of commodities for all factor-price ratios.

⁹ There is an extensive discussion in the international trade literature about the validity of the Hecksher-Ohlin model. The most known limitation of this is the Leontief Paradox. Leontief (1953) found that US exported labor-intensity commodity and imported capital-intensive ones, which reverts the H-O arguments.

¹⁰ An extensive explanation of Hecksher-Ohlin-Samuelson model is out of the aim of this paper and it is assumed to be known. A graduate level of these models can be found in Gandolfo (1994).

between sectors. Movements in relative prices create intersectoral factor reward differentials that encourage businessmen to move the factors of production until these differentials in factor reward are eliminated. Supposing a country in which the importable-sector is taken to be capital-intensive and the exportable-sector labor-intensive, a shift from an import substitution strategy to an exported-oriented strategy reduces the domestic relative prices of importable. In consequence, if the economy is on the Production Possibility Frontier (PPF), output will increase in the exportable sector and will decrease in the importable one. As the exportable segment is less capital intensive than the importable sector, a change in the composition of output increases the aggregate demand for labor and reduces that for capital. The result will be a new equilibrium where real wages increase and capital rental falls, changing the income distribution of the opening economy. Thus, according to the H-O-S model, trade liberalization is an important policy for developing countries to increase their growth and real wages.

Extensions of this basic model has been developed by other authors who demonstrate that it is possible to enrich the previous model by introducing other factor endowments such as many different capital assets or even human capital. In the last case (human capital), openness allows improvements in income distribution not only by redistributing income from capital-owners to workers, but also from skilled to unskilled workers. Even in the case of short-run factor immobility, the long-run results do not change substantially from the traditional H-O-S model. Despite these extensions over the basic model, the message in both cases is the same: in a two-country world model, the impact of liberalization on the pattern of trade and income distribution is unambiguous in terms of welfare gains and income distribution. These models, in their earlier versions, do not determine the relationship between trade and growth though demonstrates welfare gains of open up.

Theoretical and empirical evidence shed light the limitations of the H-O-S model in supporting gains from international trade, especially in developing countries. On theoretical grounds, one of the most prominent fragilities is the timing of adjustment. In fact, this model assumes instantaneous adjustment, once nominal wages are flexible, even in the short-run, and there is total factor mobility. Nevertheless, these assumptions are very strong and the results of the H-O-S model are very sensitive to them. In addition, it is possible to show other problems such as the endowment base and the inherited comparative advantage of the country in question; sectoral factor-intensities and the existing technology; labor market rigidities, their prevailing institutions and skills; homogeneity of the production function and the access to new technology.

The New Trade theorists discussed some of these fragilities. In fact, the most important characteristic of the New Trade Theory is that it takes into account the market structure under imperfect competition. The core of the New Trade Theory is that, apart from the traditional theory of international trade, differences in exploitation of comparative advantage or factor endowments in the fashion of the H-O-S model is not the only reason to international trade. Economies of scale occupy the center of the argument and justify the missing link that factor endowments and static comparative advantage do not

explain.¹¹ But even in this case, the New Trade Theory states that free trade is better than interventionism under international flows of goods and capital, since interventionist trade policies can lead to governments' failure, and retaliation, whereas protected market structures are less efficient.

New endogenous growth models, in turn, generate other results. In particular, these models argue that open up to trade results in increased rates of economic growth, a result that is often used as an argument for a trade-growth linkage. Yet less known is that endogenous growth "can also yield permanently reduced rates of growth, as when trade pushes an economy to specialize in sectors with no dynamic scale or other benefits. The theoretical relationship between trade and growth is fundamentally ambiguous." (Rodrik, 1999:27).

Another important neoclassical model relating trade and growth is Bagwhati's (1958) immiserizing growth, in which national welfare declines as a result of economic growth pushed by technological progress. This result is a consequence of the deterioration of terms of trade after growth. The basic insight of this model is that after technological progress, national welfare can decline as a result of economic growth. This is caused by a sufficiently deterioration of the terms of trade that exceeds the favorable effect on welfare due to economic growth at constant relative product prices. Therefore, the change in terms of trade leads to an effect over consumption that contributes to a worse off in the global welfare. In other words it means that open up to trade in presence of distortions can be immiserizing and thereby decreasing the welfare of the economy.

A summing up of the traditional theory of international trade is basically that international trade, apart the case of distortions or market failures, leads to a potential better welfare condition than autarky. Policy prescriptions therefore suggest that opens up to trade is always the best alternative, since for them trade and capital account liberalization policies tend to improve welfare in a static efficiency model or improve growth in a dynamic model. The limitations and strong assumptions of most models, such as the H-O-S model, conduct to the weak empirical validate of them. As a matter of fact, even mainstream authors have highlighted the fragilities of these models, leading to the New Trade Theory, which emphasizes the essential non-well behavior functions founded in the H-O-S tradition. Structuralist and Post Keynesian tradition, however, work under different assumptions that will be discussed detailed in the third item of this paper. Here, it is important to stress the fact that a more detailed approach to trade and growth has to take into consideration institutional aspects and the potential effects of demand pull factors, as well as balance of payments constraints that can follow open economies.

Srinivasan and Bhagwati (1999), criticizing the critics of liberalized trade policies as contributing factors to foster economic growth, argued that the traditional theory of international trade still shows the best way to understand trade and growth. They sustain that openness to trade, factor and technology flows, potentially contribute to the sources of growth¹². For them it is a mistake to criticize

¹¹ See Helpman and Krugman (1985) and Krugman (1990).

¹² The sources of growth are growth in inputs of production, improvements in the efficiency of allocation of inputs across activities and innovation that creates new products, and new uses for existing products and brings about increases in the productivity of inputs.

the effect of trade and growth in traditional international trade because the theory itself offers the theoretical possibilities that open up to trade can lead to worse welfare or even less growth under market failures. Therefore, being open to trade allows the economy to exploit its comparative advantage, thereby enhancing the efficiency of the allocation of domestic resources. The fruits of technology and knowledge and innovation, therefore, can be available everywhere.¹³

Once more, basically the idea here is that openness is the best way, even under market failures, to warrant dynamic efficiency and promote economic growth. For these authors, policy judgment related to international trade and growth is that openness leads to more growth by means of their effects over the sources of economic growth. For instance, for these authors the Export Promotion (EP) strategy in practice was conducive to a significantly higher growth on a sustained basis, whereas the Import Substitution (IS) strategy produced, after an early IS period of often-government-stimulated investments in several countries, an unsustainable growth path.

The basic problem in this theoretical framework relating trade and growth is that it neglects the institutional effects that openness has over some countries, as well as the fact that openness without some normative state intervention easily leads to an unsustainable growth path, mainly through balance of payments constraints over investments. Similar problems occur with open new endogenous growth models that will be discussed in the next section.

2.2. Trade and Growth in the New Endogenous Growth Models

Grossman and Helpman (1990) present a dynamic two-country model of trade and growth with endogenous technological progress. According to them, a full understanding of economic growth has to consider the accumulation of knowledge. The model emphasizes the roles of scale economies and technological progress in the growth process.¹⁴ Basically it is a two-country model in which each country engages in three productive activities: the production of a final good, the production of a continuum of varieties of differentiated middle products and, finally, research and development (R&D). A typical production function generating endogenous growth for each country is the following:

¹³ “It should be noted that market failures and distortions can undermine both efficiency and growth effects of trade policies. The General Theory of Distortions (Bhagwati, 1971) tells us that, if other distortions are present in the economy, trade liberalization need not lead to "static" gains in the shape of a Pareto improvement. When it comes to the beneficial effects of growth, Bhagwati (1958, 1968a) showed equally that in the presence of distortions, growth under free trade could be immiserizing. By the same token, as Brecher and Diaz-Alejandro (1977) showed, foreign direct investment (FDI) that is attracted to a protected capital-intensive industry in a labor - abundant economy, will surely lead to a Pareto-inferior equilibrium as compared to an equilibrium with no such foreign investment and might lead to the same outcome if the expansion of the industry comes about through exogenous domestic investment.”(Srinivasan and Bhagwati, 1999: 14)

¹⁴ Recall that economies of scale are one of the most important arguments supporting the New Trade Theory. Helpmand and Krugman (1995), Krugman (1990).

$$Y_i = BA_i L_{Y_i}^{1-\beta} \left[\int_0^n x_i(\omega)^\alpha d\omega \right]^{\frac{\beta}{\alpha}}, \quad 0 < \alpha, \beta < 1$$

Where L_{Y_i} represents employment in the final-goods sector, $x_i(\omega)$ denotes the input of middle product ω , A_i is a country-specific productivity parameter, and n is the number of varieties of middle products available at that time. This product function exhibits constant return to scale for given n . An increase in the measure of varieties of middle products raises TFP.

Price is formed as follow:

$$P_{Y_i} = \left(\frac{W_i}{A_i} \right)^{1-\beta} \left[\int_0^n p_x(\omega)^{1-\varepsilon} d\omega \right]^{\frac{\beta}{1-\varepsilon}}, \quad \beta/(1-\varepsilon) > 1$$

Where W_i is the wage in country i and $p_x(\omega)$ is the price of variety ω . Final-good producers' worldwide pay the same prices for freely traded middle products. Maximization of profits in each country will lead to a mark-up price rule, as well as to a typical intertemporal consumer maximization (it is important to take into consideration that knowledge and R&D are included in the variables of the model).¹⁵

The Grossman and Helpman (1990) model generates an endogenous rate of long-run growth that relates trade and growth by means of diffusing technology and knowledge. Their results highlight some characteristics of the relationship between trade and growth.¹⁶ First, they found that stronger relative demand for the final good of the country with comparative advantage in R&D lowers the long-run share of that country in the number of middle products and slows long-run growth of the world economy. In the absence of comparative advantage in R&D, the long run growth is independent on the relative demand for final goods.

Second, a small import tariff or export subsidy on final goods reduces a country's steady state share in middle products and R&D. Furthermore, the rate of long run growth in the world economy will be increased only if the policy-active country has a comparative disadvantage in R&D. Finally, a small R&D subsidy by both countries at a common rate increases the rate of long run growth in the world economy.

Third, the provision of a subsidy to R&D in one country increases long run growth if spending shares on the two final goods are constant and the policy is undertaken by the country with comparative advantage in R&D. Otherwise, the long run growth rate may rise or fall.

¹⁵ For a detailed exposition of the model see Grossman and Helpman (1990).

¹⁶ Some of the propositions and conclusions in Grossman and Helpman (1990) model that are not directly related to trade have been omitted.

Other important propositions drawn by the model show that import tariffs can lead to ambiguous results in terms of growth. The result will depend on the level of behavior coefficients included in the model. The basic conclusions of the model are the following: “We have studied the determinants of R&D, where research bears fruit in the form of designs for new intermediate products and in making further research less costly. New intermediate products permit greater specialization in the process of manufacturing consumer goods, thereby enhancing productivity in final production.” (Grossman and Helpman, 1990:813).

The basic criticism of models based on endogenous growth is that they keep the same approach to treat economic growth, that is, Say’s law and individual maximizing behavior, in which each agent is capable to determine his/her intertemporal maximization. The engine of growth is saving and ideas (or technology) in a different way to demand-pull and macro models that take into consideration institutions, demand and its constraints.

Indeed, the fundamental aspect to growth is investment. As Rodrik (1999) points out, investment is the engine of growth. In this sense, investment is a typical demand variable, so that neoclassical growth models, old and new, neglect the demand-pull feature of growth in capitalist economies. Besides that, McCombie and Thirlwall (1999) highlight that new growth models are also closed models, but even the open ones like Grossman and Helpman (1990) focus only in trade and growth, neglecting balance of payments constraints. Institutions are also important in economic growth due to the fact that investment is correlated with the institutional environment in each country.

In Structuralist and Post Keynesian tradition, balance of payments constraints as well as internal saving and budget constraints are also central variables for the understanding of trade and growth. The prevailing orthodoxy is still to analyze growth from the supply side and neglects the manifest balance of payments difficulties experienced by many countries. This is summarized also in the more recent new or endogenous growth theory. The neoclassical approach uses the aggregate production function and attempts to explain the growth of output in terms of the growth of factor inputs. The production differences in the growth of output among countries are thus accounted for in terms of differences in the rates of growth of labor inputs, capital accumulation and technical progress as the determinant of productivity growth. (McCombie and Thirlwall, 1999).

One of the tribulations of the open neoclassical growth theory is that demand constraints never enter explicitly in the model. Therefore, there is no trade off related to balance of payments constraints, so that long run growth is determined by labor force, ideas, or research and development without explicitly reference to investment and demand constraints. Where trade is included it is to capture the technological spillovers from trade, which may also keep the marginal product of capital from falling as capital accumulation takes place. In the empirical studies that attempt to test new growth theory trade is measured as the ratio of trade to GDP as a measure of the openness of an economy.

Nonetheless, as McCombie and Thirlwall (1999) emphasize exports and imports related to GDP do not capture the dynamic effect of trade to growth. In contrast, in order to capture the dynamic effect

of trade from both demand and supply side, growth rate of exports related to marginal propensity to imports is clearly more appropriate. Exports are, also, an important demand side variable because they allow other components of demand to grow faster than other demand variables by means of Hicks supermultiplier.

3. TRADE AND GROWTH IN THE KEYNESIAN TRADITION:

Structuralist and Post Keynesian tradition analyze trade and growth by means of export led growth, import substitution strategy, and balance of payments constraints. Post Keynesian tradition, stimulated by Harrod, Domar, and Kaldor, demonstrates the importance of investment and foreign multiplier as determinants of long-run economic growth. Structuralists, also based in demand-pull characteristics of economic growth, emphasize the importance of current account deficits and financial aspects in capital account. As Findlay (1984) points out:

“The earlier literature on development tended to emphasize domestic saving as the major constraint on the growth rate that an LDC could achieve. This view arose out of the widespread application of the Harrod-Domar model to problems of development planning. The experience of many LDC’s in the 60’s, however, indicated that Balance of Payments situation tended to be a critical constraint on the rate of growth”. (Findlay, 1984: 215).

Chenery and Bruno (1962) presented a two gap model that highlight the role of external and saving gaps to limit long-run economic growth. Three gap model and gap models later sophisticated this type of model (Taylor, 1994). Taylor (1991, 1993) also presents a stylized structuralist model relating trade policy and growth.

In the two gap model both the foreign external gap and the domestic saving gap explain the poor performance of countries. The economic policy, therefore, should attack these gaps in order to relax some impediments to long-run economic growth. The structuralist approach, in turn, fits well mainly in developing economies, in which those gaps are particularly problematic. Here, the external gap is the important one, since I intend to analyze the effects of trade on growth. As Findlay (1984) shows, the foreign exchange gap can be represented in a simple equation.

$$\frac{dY}{dt} = \alpha [X_0 e^{gt} - mY] \quad (1)$$

Where Y is the domestic product, X is exports, m is the propensity to import consumer goods (or income elasticity to imports), and α is the incremental output capital ratio. It is assumed that export volume increases over time at a constant rate g . Once equation (1) is a differential equation in Keynesian fashion, the income growth rate is a function of exports growth rate. Its general solution is:

$$Y_{(t)} = \left(\frac{\alpha}{g + \alpha m} \right) X_0 e^{gt} + \left[Y_0 - \frac{\alpha}{g + \alpha m} X_0 \right] e^{-amt} \quad (2)$$

Equation (2) shows that, in the limit, the growth rate of production will approach the growth rate of exports. One important aspect to be highlight in this approach is that it neglects the role of relative prices in determining export performance. In fact, in a two-gap approach, the external gap depends solely on the income effect. Assuming a small country and that the Marshall-Lerner condition holds, there is an extensive literature showing that price effect is secondary in trade equations, so that price changes do not represent a great impact in exports.¹⁷ This approach, therefore, supposes that competitiveness is the most important component that affects current account performance of countries, mainly the developed ones. Countries that have absolute comparative advantage in most goods generally will be able to grow faster than their competitors. As Blecker (1992) pointed out, trade deficits in the US are a good example of the importance of competitiveness and income elasticities to import, rather than movements in relative prices. Indeed, empirical evidence shows that exchange rate movements have not offset improvements in industrial competitiveness neither led to trade balance adjustment.

Post Keynesian literature finds in Kaldor export-led growth model the starting point to explain theoretically and empirically the relationship between trade, growth and balance of payments constraints. Departing from Kaldor's standpoint, Thirlwall (1979) applied the Balance of payments constrained economic growth model (BPC) looking at industrialized economies, and, later, applied it bearing in mind the effects of capital flows, so his model could be extended to fit better in developing economies. The basic idea of the BPC model is that differences among countries long-run growth can be explained by demand. More specifically, "growth rates differ because the growth of demand differs between countries" (Thirlwall, 1979, p. 51), and the more important constraint in demand is the balance of payments. Thirlwall's model is simple and admits that long-run economic growth will depend on the relationship between income elasticities of import and exports, holding the Marshall Lerner condition and keeping relative prices of traded goods stationary. In his model, trade affects economic growth by influencing the demand for final goods and, indirectly, through its influence on investment.

Kaldor (1970) developed an export-led growth model built on the notion of cumulative causation, and it takes into consideration the fact that exports are the main component of demand. In Kaldor's model, the output growth is defined as

$$g = \phi x \quad (3)$$

Where g is the rate of growth of output, x is the rate of growth of exports, and ϕ is the Hicks supermultiplier, *i.e.* the elasticity of output growth with respect to export (autonomous expenditure)

¹⁷ See Blecker (1992) and Fargerber (1996) for an empirical assessment of this point.

growth. From the fact that exports are function of world income, prices and exchange rate, one can assume the following export function:

$$X = K_l \left(\frac{P_d}{EP_f} \right)^\eta Z^\varepsilon \quad (4)$$

Where X is the level of exports; K_l is any constant; P_d is the domestic prices of exports; P_f is the foreign prices; Z is the level of world income; E is the domestic prices of foreign currency; η is the price elasticity of demand for exports; ε is the income elasticity of demand for exports. Taking (4) as growth rates, it can be described as

$$x = \eta (p_d - p_f - e) + \varepsilon Z \quad (5)$$

Where small letters represent growth rates. Domestic inflation can be derived from the traditional mark up pricing equation that relates wages, prices and labor-output ratio (productivity). From that, deriving with respect to time, in logarithmic form we have

$$p_d = \tau - w - l \quad (6)$$

Where w is the rate of growth of the nominal wage rate; l is the rate of growth of labor productivity, and τ is the mark up on unit labor costs. In addition, the Kaldorian model assumes, following Verdoorn's Law, that the rate of growth of labor productivity is a function of the rate of growth of output. This can be represented by:

$$l = l_a + v g \quad (7)$$

Where l_a is the rate of autonomous productivity growth, and v is the Verdoorn coefficient. Combining equations (3), (5), (6), and (7) and solving for the rate of growth of output, we obtain:

$$g = \frac{\phi[\eta(w - l_a + \tau - p_f - e) + \varepsilon Z]}{1 + \phi \eta v} \quad (8)$$

Equation (8) emphasizes the role of the rate of growth of foreign demand, Z , in output growth¹⁸. A common feature with the Keynesian model is the fact that it is the rate of growth of autonomous demand that determines the rate of growth of output.¹⁹ The model presented highlights that expansionary

¹⁸ Equation (8) will lead to the Thirlwall's model of balance of payments constrained economic growth. The equation, after some assumptions leads to that $g = (1/\pi)x$, where π is the income elasticity of imports.

¹⁹ In the Keynesian model the level of autonomous spending determines the level of output, rather than the rates of growth.

demand policies have cumulative effects, since the higher the rate of growth of output, the faster the rate of growth of productivity, whereas the faster the rate of growth of productivity the lower the rate of increase in unit costs and hence the faster the rate of growth of exports. This feature contributes to the explanation of income disparities between developed and underdeveloped countries, since the cumulative causation above-mentioned can operate in opposite way in case of balance of payments constraints and high income elasticity of demand *vis-à-vis* income elasticity of exports. This is the case of underdeveloped countries, in which balance of payments constraints lead to impediments to economic growth. Indeed, there is a vicious circle where the lower the rate of growth of output, the lower the growth rate of productivity, and the lower the rate of growth of productivity the higher the increase in unit costs and thereby the lower the rate of growth of exports.

The above-mentioned model has a close relationship with the two-gap model, and also stimulates the Balance of Payments constrained economic growth (BPC) model. In fact, this model is a special case of gap models, as shown in the foreign gap of equation (2), once one of the basic constraints to growth is the external gap, defined by balance of payments constraints. Thirlwall (1979) developed his model based on Kaldorian model and shed light on the balance of payments constrained economic growth in a typical demand-led version.²⁰

The debate concerning the export-led characteristics of the Post Keynesian/Kaldorian model is important to be clearly explained. Indeed, at a first glance, the Post Keynesian model of trade and growth is only export-led. This feature, however, needs to be more explained in order to avoid misunderstanding with neoclassical outward-oriented strategies to economic growth in opposition of inward-oriented strategies. Income elasticities of imports are central in the Post Keynesian approach.

Indeed, export-led growth alone can also lead to balance of payments constraints in the long-run growth if the income elasticity of imports remains unchanged. The reason is simple: an export-led growth strategy does not lead necessary to a long-run stable growth path due to the role of imports. In fact, if income elasticity of imports is high, short-run growth can be achieved at the cost of decreasing current account balance, since domestic income will increase, and thereby imports will increase proportionally more than the growth of income. High income elasticities of imports, therefore, prevent that income increases without balance of payments constraints. In this case, a typical export-led strategy can be failed and the cumulative process based in the Verdoon's law does not work. Quite the contrary, the cumulative process works in an opposite way, generating a vicious circle of low productivity and growth.²¹ It is important to stress, however, that income elasticity of imports tend to be stable in the long run (McCombie and Thirlwall, 1999). Jayme Jr (2001) shows the stable pattern of the income elasticity of imports in Brazil from 1955 to 1998. This feature, on the other hand, does not invalidate the need for an alternative theory that takes into considerations the crucial role of the income elasticity of imports in relaxing the Trade Balance rigidity.

²⁰ A detailed exposition of Thirlwall's model can be seen in Thirlwall (1979).

²¹ Which lead to Trade Balance rigidities. This is a typical stylized fact in Latin America countries in 1990s. See Curado (2001).

The Post Keynesian tradition, therefore, shows the case of export-led growth and, also, shed light on the importance of income elasticity of imports. There is, thus, the possibility in establishing a connection with the structuralist tradition. The novelty of both approaches (Structuralist and Post Keynesian) is to emphasize, not only the role of exports in the sense of their demand-pull feature, but also the importance of a structural base to avoid high external dependency. It can frequently lead to impediments to economic growth by means of current account deficits, and problems in capital account due to the particular instable behavior of capital flows. The important aspect to take in consideration in the Kaldorian model and its Post Keynesian counterpart is to establish the classic Keynesian principle of effective demand in the long run. The Kaldorian model also implies that, in general, although not always, it is the balance of payments the central constraint to warrant stable economic growth. Export-led growth, thus, has the advantage of easing the balance of payments constraint by providing the foreign exchange needed for essential imports. Nevertheless, as emphasized above, it takes into consideration the important effect of the income elasticity of imports to relax balance of payments constraints.

In contrast with the neoclassical standpoint, models in Post Keynesian/Kaldorian and Structuralist tradition not only emphasizes the role of effective demand and the balance of payments, but also shows that government demand management policies are crucial for economic growth. While neoclassical versions of open model prescribes a compassionate *laissez faire*, except for the case of market failures, the demand-led models imply that policies that stimulate the growth of demand without putting pressures on the balance of payments should be emphasized.

4. CONCLUSIONS

This paper explored critically the relationship between trade and growth. More specifically, it examined whether trade affects growth. It was shown that theoretically this question is, at least, ambiguous. The classical theory of international trade is restricted to define clearly this point. As a matter of fact, the Ricardian Comparative Advantage theory deals with the static gains of international trade, which does not deal direct with growth. A dynamic version of the Ricardian approach addressed by Findlay (1984) does not reach to an unambiguous outcome in terms of the benefits of trade to growth. Quite the contrary, open up to trade can be hurt for growth in his model. The H-O-S model is also restricted to define the effects of international trade to economic growth, since their restrictive assumptions are strong.

Modern endogenous open growth models, and the New Trade Theory also poses no clear results regarding to openness and growth. New Trade theorists, indeed, states that free trade is better than interventionism due to the fact that interventionism in trade leads to nonmarket failures and retaliation that could conduct to impediments to growth. The efforts in defining a clear relationship between international trade and growth are limited. As a matter of fact, it was difficult to explain that open up to trade would stimulate growth by means its effects over TFP growth.

In another theoretical vein, Post Keynesian and Structuralist theory of trade and growth highlight the importance of balance of payments constraints and investments for long run economic growth in a demand-led approach. Both approaches underline the significance of investment demand as central element in warranting economic growth. This approach emphasizes the role of trade in preventing long run economic growth due to harmful effects over current account.

Thinking about openness is meaningless outside a country's historical and institutional context, which represents a fundamental issue to discuss openness and growth. Balance of payments is essential in any theory of economic growth, and represents an important variable to delimit the best level of openness in any economy. Large countries tend to be closer whereas exchange rate dynamic inflation, fiscal constraints as well as international environment can define the best growth strategy to countries. There are, then, distinct policy prescriptions that relate trade policy and growth, or the relationship between openness and growth. Therefore, it is important to bear in mind institutional aspects of countries. Even if Thirlwall's argument demonstrates the importance of trade to growth, policy prescriptions can be distinct for each country. For instance, export-led growth or import substitution can be efficient for some countries but inefficient for others.

One of the limitations of the alternative view of Trade and Growth is that it lacks microeconomics foundations. As a matter of fact, the Keynesian tradition emphasizes investment as the engine of growth, but they do not discuss more closely technological change and its relations with growth. Their focal point is the macroeconomics aspects to growth and their interrelations with trade. This paper, also, analyzes only macroeconomic aspects of trade and growth, taking into consideration their external constraints and the limits of openness in foster economic growth. The analysis of this aspect using microeconomic foundations has been carrying out by the neo-Shumpeterian literature and further studies can be made to connect the above mention tradition with Post Keynesians and Structuralists.

5. REFERENCES

- Barro, R. J. 1991. Economic Growth in a cross-section of Countries. *Quarterly Journal of Economics*. Vol. 106(2): 407-43.
- Barro, R. J. 1997. *Determinants of Economic Growth: A cross country empirical study*. Cambridge, Massachusetts: MIT press.
- Bhagwati, J. 1958. Immiserizing Growth: A Geometric Note. *Review of Economics Studies*, 25(3): 201-5.
- Ben-David, Dan and A. Kimhi. 2000. Trade and the Rate of Income Convergence. *NBER Working Papers 7642*, April.
- Blecker, R. 1992. Structural Roots of U.S. trade problems: income elasticities, secular trends and hysteresis. *Journal of Post Keynesian Economics*, 13(3): 321-46.
- Blecker, R. 1999a. *The fallacy of composition and the limits of Export-Led Growth*. New School for Social Research, Unpublished manuscript.
- Blecker, R. 1999b. *Taming Global Finance*. Washington, D.C. Economic Policy Institute.
- Chenery, H.B. and Michel Bruno. 1962. Development alternatives in an open economy: The case of Israel. *Economic Journal*. 72(1): 70-103
- Curado, M. 2001. *Movimento de Capitais e Rigidez na Balança Comercial*. Unpublished Doctor Dissertation, Universidade Estadual de Campinas, São Paulo.
- Dale, B. & T. Lee. 1996. International Trade and the Performance of U.S. Labor Markets. In: Blecker, R. Editor. *U.S. Trade Policy and Global Growth*. Amonk, NY: M.E. Sharpe.
- Dixon, R. and Anthony Thirlwall. 1975. A model of Regional Growth Differences along Kaldorean lines. *Oxford Economic Papers*. 27(2): 201-14.
- Dollar, D. 1992. Outward-oriented Developing Economies Really do Growth more Rapidly: Evidence from 95 LDCs, 1976-85. *Economic Development and Cultural Change*, 1992, 523-544.
- Easterly, W., N. Loyaza. 1997. Has Latin America's post-reform growth been disappointing? *Journal of International Economics*, 43(2): 287-311.
- Edwards, S. 1992. Trade orientation, Distortions, and Growth in Developng Countries. *Journal of Development Economics*. 39(1): 31-57.
- Edwards, S. 1993. Trade Policy, exchange rates and growth. *NBER Working papers n.4511*, Cambridge, Massachusetts, February.
- Edwards, S. 1998. Openness, Productivity, and Growth: What Do We Really Know? *Economic Journal*, 108(1): 383-98.
- Fargerber, J. 1996. Technology and Competitiveness. *Oxford Review of Economic Policy*. 12(3):.

- Findlay, R. 1984. Growth and Development Trade Models. In: Jones, R.W. and P.B. Kenen, eds. *Handbook of International Economics*. Amsterdam, North-Holland.
- Frankel, Jeffrey and David Romer. 1999. Does Trade causes Growth? *American Economic Review*. 89(3): 379-99
- Frenkel, Roberto. 1998. *Capital Market Liberalization and Economic Performance in Latin America*. Working papers Series III, n.1. Cepa, New School.
- Frenkel, Roberto and Martin Rozada. 1999. *Balance of Payments liberalization: effects on growth and employment in Argentina*. Paper prepared for Cepa, New School Conference on Globalization and Social Policy. January.
- Fitzgerald, E.V.K. & G. Perosino. 1996. *Trade Liberalization, Employment, and Wages: A critical Approach*. Unpublished manuscript.
- Gandolfo, G. 1994. *International Economics*. V.1. Springer Verlag, New York, 2nd edition.
- Grosman, G. 1986. Imports as a cause of Injury: the case of the US Steel Industry. *Journal of International Economics*, 20(2): 201-23.
- Grosman, G. and Elhanan Helpman. 1990. Comparative advantage and long-run growth. *American Economic Review* 80(4): 796-815.
- Grosman, G. and Elhanan Helpman. 1991. *Innovation and Growth in the Global Economy*, Cambridge: MIT press.
- Hanson, G. and A. Harrison. 1995. Trade, technology, and wage inequality. *NBER Working paper*. 5110.
- Harrison, A. 1996. Openness and Growth: A time-series cross-country analysis for developing countries. *Journal of Development Economics*. 48(3): 419-47.
- Harrison, Ann and Gordon Hanson. 1999. Who gains from trade reform? Some remaining puzzles. *NBER Working Papers 6915*, January.
- Helleiner, G. K. 1996. *Trade, Trade Policy, and Industrialization*. Unpublished manuscript.
- Helpman, Elhanan and P. Krugman. 1985. *Market Structure and Foreign Trade*. MIT Press, Cambridge, Massachusetts.
- Holland, M., O. Canuto, and C. Xavier. 1998. Taxa de Câmbio, Elasticidades-renda e saldo comercial na Economia Brasileira. *Revista Brasileira de Economia*, 52(2): 323-34.
- Jayme Jr, F.G. 2001. Balance of Payments Constrained Economic Growth in Brazil. *Texto para Discussão* n. 155. Cedeplar/UFMG.
- Kaldor, N. 1970. The Case for Regional Policies. *Scottish Journal of Political Economy*. November.
- Krueger, Anne O. 1997 'Trade Policy and Economic Development: How We Learn,' *American Economic Review*, 87(1): 1-21.

- Krugman, Paul, and Lance Taylor. 1978. 'Contractionary Effects of Devaluation,' *Journal of International Economics*, 8(3): 445-456.
- Krugman, P. 1989 Differences in Income Elasticities and Trends in Real Exchange Rates. *European Economic Review*. 33(5): 1031-46.
- Krugman, P. 1990 *Rethinking International Trade*. MIT Press, Cambridge, Mass.
- Laplane, M. And F. Sarti. 1999. *Investimento Externo estrangeiro e o impacto na Balança Comercial nos anos 90*. Texto para Discussão N. 629 Ipea: Rio de Janeiro. Fevereiro.
- Leontief, W.W. 1953. Domestic Production and Foreign Trade: The American Position Reexamined. *Proceedings of the American Philosophical Society*, 97(3): 332-49.
- McCombie, J. 1989. Thirlwal's Law and balance of payments constrained growth - a comment on debate. *Applied Economics*, 21(5): 611-29.
- McCombie, J. 1992. Thirlwal's Law and balance of payments constrained growth - more on the debate. *Applied Economics*, 24(5): 493-512.
- McCombie, J. 1993. Economic Growth, Trade linkages, and The Balance of Payments Constraint. *Journal of Post Keynesian Economics*, 15(4): 471-505.
- McCombie, J. 1997. On The Empirics of The Balance-Of-Payments-Constrained Growth. *Journal of Post Keynesian Economics*, 9(3): 345-75.
- McCombie, J. and A. Thirlwall. 1994. *Economic Growth and the Balance of Payments constraint*. London, St. Martins.
- McCombie, J. and A. Thirlwall. 1997. The dynamic Harrod Foreign Trade Multiplier and the Demand-oriented Approach to Economic Growth: an evaluation. *International Journal of Applied Economics*, 11(1): 5-26.
- McCombie, J. and A. Thirlwall. 1999. "Growth in an international context: a Post Keynesian view". In: Deprez, J. and John Harvey. *Foundations of International Economics: Post Keynesian Perspectives*. London, Routledge.
- Milberg, William S. 1997. *The Revival of Trade and Growth Theories: Implications for Income Inequality in Developing Countries*, Department of Economics, New School, New York.
- Ocampo, Jose Antonio. 1997. *Trade Policy and Productivity*, Ministry of Finance, Bogota.
- Ocampo, J.A. & L. Taylor. 1998. *Trade Liberalization in Developing Countries: Modest benefits but Problems with Productivity Growth, Macro Policies, and Income Distribution*. Working papers Series I, n.8. Cepa, New School.
- Rodrik, Dani. 1994. 'The Rush to Free Trade in the Developing World: Why so Late? Why Now? Will it Last?' in Stephan Haggard and Steven B. Webb (eds.) *Voting for Reform*, New York: Oxford University Press.

- Rodrik, Dani. 1995. 'Trade and Industrial Policy Reform.' in Jere R. Behrman and T. N. Srinivasan (eds.) *Handbook of Development Economics*, vol. 3B, Amsterdam; North-Holland.
- Rodrik, Dani. 1999. *The New Global Economy and Developing Countries: Making Openness Work*. Washington, DC. Overseas Development Council.
- Rodrik, Dani and André Velasco. 1999. *Short-term capital flows*. NBER Working Papers n.7364. Cambridge, Massachusetts. September.
- Rodríguez, F. and Dani Rodrik. 1999. *Trade policy and Economic Growth: a Skeptic's guide to the Cross-National evidence*. NBER Working Papers n.5791. Cambridge, Massachusetts. April.
- Ros, Jaime and Nora Lustig. 1999. *Trade and financial liberalization with volatile capital inflows: Macroeconomic consequences and Social impacts in Mexico during the 1990's*. Paper prepared for Cepa, New School Conference on Globalization and Social Policy. January.
- Sachs, J. and A. Warner. 1995. Economic reform and the Process of Global Integration. *Brooking Papers on Economic Activity*, 1: 1-117.
- Shaikh. Anwar. 1999. *Real Exchange Rates and the International Mobility of Capital*. Working paper N. 265. March.
- Srinivasan, T.N. and J. Bhagwati. 1999. *Outward-Orientation And Development: Are Revisionists Right?* Unpublished manuscript.
- Taylor, L. 1991. *Income Distribution, Inflation, and Growth*, Cambridge MA: MIT Press.
- Taylor, L. 1993. Economic openness: Problems to Century's end. In Tariq, Banuri. *Economic Liberalization: No panacea*.
- Taylor, L. 1994. 'Gap Models,' *Journal of Development Economics*, 45(1): 17-34.
- Taylor, L. 1997. 'The Revival of the Liberal Creed – The IMF and the World Bank in a Globalized Economy,' *World Development*, 25(2): 145-52.
- Thirlwall, A. 1979. Balance of Payments constraint as an Explanation of International Growth Rate differences. *Banca Nazionale del Lavoro Quarterly Review*. 128(1): 45-53.
- Thirlwall, A. 1991. Professor Krugman 45-degree rule. *Journal of Post Keynesian Economics*, 14(1): 23-28.
- Thirlwall, A. 1997. Reflections on the concept of balance-of-payments-constrained growth. *Journal of Post Keynesian Economics*, Spring, 19(3): 377-85.
- Thirlwall, A. and N. Hussein. 1982. The Balance of Payments Constraint, Capital Flows and Growth Rate Differences Between Developing Countries. *Oxford Economic Papers*, November.
- Viner, J. 1937. *Studies in the Theory of International Trade*. New York, Harper and Brothers.