

Low, Patrick; Olarreaga, Marcelo; Suarez, Javier

Working Paper

Does globalization cause a higher concentration of international trade and investment flows?

WTO Staff Working Paper, No. ERAD-98-08

Provided in Cooperation with:

World Trade Organization (WTO), Economic Research and Statistics Division, Geneva

Suggested Citation: Low, Patrick; Olarreaga, Marcelo; Suarez, Javier (1998) : Does globalization cause a higher concentration of international trade and investment flows?, WTO Staff Working Paper, No. ERAD-98-08, World Trade Organization (WTO), Geneva, <https://doi.org/10.30875/fd106603-en>

This Version is available at:

<https://hdl.handle.net/10419/90671>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

World Trade Organization
Economic Research and Analysis Division

**Does globalization cause a higher concentration of international trade
and investment flows?**

Patrick Low *WTO*
Marcelo Olarreaga *WTO and CEPR*
Javier Suarez *University of Geneva*

Manuscript date: August, 1998

Disclaimer: This is a working paper, and hence it represents research in progress. This paper represents the opinions of individual staff members or visiting scholars, and is the product of professional research. It is not meant to represent the position or opinions of the WTO or its Members, nor the official position of any staff members. Any errors are the fault of the authors. Copies of working papers can be requested from the divisional secretariat by writing to: Economic Research and Analysis Division, World Trade Organization, rue de Lausanne 154, CH-1211 Genève 21, Switzerland. Please request papers by number and title.

Does Globalization Cause a Higher Concentration of International Trade and Investment Flows?*

Patrick Low†

Marcelo Olarreaga‡

Javier Suarez§

August 1998

Abstract

It has sometimes been argued that "globalization" benefits only a small number of countries, and that this leads to greater marginalization of excluded countries. This paper argues that globalization is not necessarily biased towards greater concentration in international trade and investment flows. Marginalization is more likely to be explained by domestic policies in relatively closed countries. The paper shows that among relatively open economies, the concentration of international trade and investment flows has declined over the last two decades, whereas the opposite is true among relatively closed economies. Thus, marginalization is not intrinsic to globalization.

(JEL F11, F13, F21)

Key Words: Globalization, international trade and investment flows concentration.

* We are grateful to Sanoussi Bilal and participants at the CEPR/Venice International University workshop on Globalization, Regional Integration and Development, Venice, 31 January 1998. The views expressed here are those of the authors and do not necessarily reflect those of the institutions with which they are associated.

† Economic Research, World Trade Organization, 1211 Geneva 21, Switzerland, e-mail: Patrick.Low@wto.org.

‡ Economic Research, World Trade Organization, 1211 Geneva 21, Switzerland, and CEPR, London UK; e-mail: Marcelo.Olarreaga@wto.org.

§ Dpt of Political Economy, University of Geneva, 1211 Geneva 4, Switzerland, e-mail: Javier.Suarez@ecopo.unige.ch.

Non-technical summary

The rapid increase in international trade and investment flows over the last two decades is often seen as an important source of efficiency gains and growth. However, it has sometimes been argued that the impressive 5 and 12 percent annual growth of international trade and investment flows since the early 1970s has not contributed to overall world growth, but only benefited a small number of countries. In other words, the argument is that there has been an in-built bias that led to a concentration of trade and investment flows among only a few countries, implying the marginalization of others in world trade and investment. This paper argues that there are no reasons to believe that this is the case, and empirical evidence at the world level tends to show the opposite. The explanation for marginalization of some countries or regions resides in the domestic policies of the affected countries and should not be seen as a natural consequence of rapid increases in international trade.

The assertion that only a few countries have benefited from the rapid increase in trade, while others have been marginalized, looks credible at a first glance. An often quoted example of marginalization in world trade is Sub-Saharan Africa, which accounted for 3.1 percent of world exports in the 1950s and saw its share fall to 1.2 by 1990. More generally, Africa's share of world exports, for example was half its 1985 level in 1996. Similarly, Latin America lost 14 percent of its share during the same period (from 5.6 percent to 4.9 percent), whereas Western Europe increased its share of world trade by 11 percent (from 40.1 to 44.6 percent). Thus, there is a feeling that the increase in international trade has been largely restricted to a handful of countries. Similarly, 85 percent of FDI inflows to developing countries are concentrated in only 10 countries (China alone accounts for 40 percent of FDI inflows to developing countries). However, these figures give only a partial picture. The share of Asian countries in world trade has increased by more than 25 percent between 1985 and 1996. Thus, a full picture of what has happened to the concentration of trade flows during the last two decades requires a broader geographical approach.

Two questions are asked. First: *Was the increase in international trade evenly distributed across countries or has it been concentrated among only a few countries?* Whether trade has been evenly redistributed at the world level or not, there is evidence that some countries have been

marginalized. The second question is: *What has caused the marginalization of some countries in world trade?*

This paper employs three different concentration indicators to explore the first question (Herfindal-Hirschman concentration index, Theil-entropy coefficient and the Mean Logarithm deviation). These indicators share at least two desirable properties: first, they satisfy the Pigou-Dalton condition which implies that any "transfer" from a country with a high share of world trade to a country with a low share of world trade decreases the level of the concentration index. This may seem an obvious property, but it is clearly not satisfied when observers argue that the share of Africa's trade in world trade has declined. Second, they are decomposable, which is a desirable property when answering the second question of why some countries have been marginalized. We also allow the indicators to have different degrees of homogeneity on the level of world trade. The idea is to capture the effect that a rapid increase in world trade may have on countries' perceptions of their share of world trade (e.g., a high concentration of international flows may be more burdensome in a world where few international transactions occur). In other words, it may be better to have a small share of a large pie than a larger share of a smaller pie.

The period under examination is 1976-1995 and the sample contains data for 127 developing and developed countries. Results show that:

- *trade and investment concentration* indices suggest an ambiguous picture regarding the evolution of the concentration of international trade and investment flows if we do not account for the significant increase in world trade throughout the period (i.e., indicators are homogenous of degree zero on the level of world trade). When indicators suggest an increase in concentration, it appears that this essentially occurred among economies which have large shares of world trade and not among small trading partners. Moreover, if one corrects the concentration indices to account for the increase in world trade, then trade concentration unambiguously falls throughout the period for any level of homogeneity larger than 0.25 (i.e., low sensitivity of the concentration indicators with respect to the level of world trade).
- when dividing the sample of 127 countries into open and closed economies, it appears that concentration of trade and financial flows has unambiguously fallen among open economies, whereas it has increased among closed economies.

From these results, we conclude that marginalization of some countries from world markets can be mostly explained by inward-looking domestic policies. Marginalization in world trade is not inherent to the globalization process.

1 Introduction

International trade and investment flows have increased more rapidly than world GDP over the last two decades.¹ This rapid growth of international transactions has sometimes been referred to as "globalization".² Most economists would argue that the rapid increase in international transactions may be seen as a source of efficiency gains and growth³, as countries tend to specialize in the production of goods in which they have a comparative advantage.

However, it has sometimes been argued that globalization has not contributed to overall world growth, but only benefited a small number of countries, while many others have failed to reap the benefits of rapid increases in international trade and investment flows. In other words, the globalization process contains an in-built bias that leads to a concentration of trade and investment flows and greater inequality. This paper argues that there are no reasons to believe that globalization may induce marginalization. The explanation for increasing inequality among nations and marginalization resides in the domestic policies of the affected countries.

Section 2 discusses some theoretical and empirical arguments to explain why "Globalization" does not necessarily lead towards greater concentration of international trade and investment flows. It also reports some evidence on the changes in the concentration of international trade and investment flows at the world level from 1972 to 1995. The evidence is somewhat mixed for both investment and international trade flows, and the results depend on the type of indicators that are used. When using indicators of concentration that are homogeneous of degree larger than 0.25, the concentration of both trade and investment flows have unambiguously fallen during the period 1972-1995. Giving some degree of homogeneity to the concentration indicator is justified by the fact that it is better to have a smaller share of a big pie than a larger share of a small pie.

¹ Real international trade and investment flows have increased at an average of 4.6% and 12.2% respectively over the last two decades. By investment flows we understand portfolio and foreign direct investment.

² This is a loosely defined term but in this paper we define it as such.

³ There is also a huge and controversial literature on the potential drawbacks from "globalization", at least in the short run, such as increase of income inequality or unemployment. These issues fall outside the scope of this paper.

The next step, undertaken in Section 3, is to classify countries into open and closed economies in order to identify whether changes in the concentration of international trade and investment flows may be explained by domestic policies. The basic notion of openness is defined in terms of the ratio of trade and investment flows to GDP. These indicators are corrected to account for some of the criticisms that have been made in the literature by controlling for certain factors, such as the size of the economy and the share of non-tradable sectors in total GDP. For example, our correction shows that one should expect large countries to have a relatively smaller share of trade in GDP. Thus, if a large and a small country share the same trade to GDP ratio, the former should be seen as a more open economy.

Section 4 estimates the concentration of trade and investment flows from 1972 to 1995, using different indicators of concentration. It shows that there has been a tendency towards a lower level of concentration of trade and investment flows among open economies, whereas the opposite is true for closed economies. Section 5 provides some concluding remarks.

2 Does globalization cause marginalization?

The assertion that only a few countries have benefited from "globalization", while others have been marginalized, looks credible at first glance. Africa's share of world exports, for example, was half its 1985 level in 1996. Similarly, Latin America has lost 14% of its share during the same period (from 5.6% to 4.9%), whereas Western Europe increased its share of world trade by 11% (from 40.1% to 44.6%).⁴

As for FDI, the figures suggest a similar state of affairs: nine developing countries receive 41% of total inflows of FDI to developing countries in 1993 whereas they represent only 17% of total developing countries' GDP, and these figures excludes China which represents 40% of developing countries total inflows.⁵ Moreover, developed countries' share of world outflows is close to 85%.⁶

⁴ See WTO (1997).

⁵ Unido (1996).

⁶ Unctad (1997).

These trends are illustrated in Figure 1 below, which shows the evolution of the share of sub-Saharan African countries in total world trade and investment flows. Both shares tended to fall during the period 1976-1995, though the trend is more impressive for the share of trade.

Insert Figure 1: sub-Saharan Countries: evolution of share in world trade and investment flows

Thus, there is the feeling that "globalization has been largely restricted to a handful of countries".⁷ As world trade and investment flows increase, the argument is that these tend to be more concentrated among a few countries. However, the figures given above only give a partial picture of the story. Trade and investment flows have also allowed some developing countries to grow faster. Note that the share of Asian countries in world trade has increased by more than 25% between 1985 and 1996.⁸ Also, the share of FDI from developing countries in world FDI more than doubled from 6% in 1985 to 14% in 1996.⁹ Thus, a global picture of what has happened to the concentration of trade and investment flows requires a broader approach.

The aim of this section is to check whether a careful analysis of the evolution of trade and investment flows over the last two decades can confirm the idea that international trade and investment flows are more concentrated than they were two decades or so ago. We calculate different concentration indices across time for world trade and world investment flows for a sample of 144 countries (including both developing and developed countries). It appears that the evidence is mixed, as reported in section 2.2. Section 2.1 describes the different indices that we employed and their properties.

2.1 Concentration Indices

In order to evaluate the level of concentration in world trade and investment flows we employed 3 different indicators. Each of these indicators has different properties. The indicators also share, at least, two desirable properties: first, they satisfy the Pigou-Dalton condition which implies that any "transfer" from a country with a high share of world trade to a country with a low share of world trade decreases the level of the concentration index. This may seem an obvious

⁷ Unido (1996).

⁸ WTO (1996).

⁹ Unctad (1997) and IFC (1997).

property but neither the Rawls criterion, nor the Quantile analysis, often used to claim that Globalization has only benefited a few countries satisfy this. Second, they are decomposable, which will be a desirable property in section 5 when the sample is decomposed into open and closed economies.

The first concentration index we employed is also the most commonly used indicator of concentration, i.e. the Herfindhal-Hirschman concentration index (H). It is given by:

$$H = \sum_i s_i^2 \quad \text{where} \quad s_i = \frac{f_i}{F} \quad (1)$$

where f_i are trade or investment flows of country i ; F are total world trade or investment flows (i.e. $F = \sum_i f_i$); thus, s_i is the share of country i 's trade or investment flows on total world trade or investment flows.

The Herfindhal-Hirschman index increases with the level of concentration. It reaches its upper-bound of 1 with a maximum level of concentration and its lower-bound of 0 with a minimum level of concentration. The Herfindhal-Hirschman index is a flow-weighted concentration index which implies that it can be decomposed according to the shares of total flows of each group. Thus, the weight given to each group depends on the trade share of each group. The Theil entropy coefficient (T) also shares this property and is given by:

$$T = \sum_i s_i \log(s_i) \quad (2)$$

The main difference between H and T is that the former is a convex function on the shares of world flows, whereas the latter is a concave function on the shares. This implies that the former is more influenced by changes in the share of large countries whereas the latter is more influenced by changes in the share of small countries. A comparison of the evolution of these two indices may give us some important information on which countries (small or large in terms of trade and investment flows) have experienced changes in their shares. If, for example, T is relatively constant through time, whereas H increases, this implies that the increase in concentration has mainly occurred within the group of countries which have a large share of

international flows. Thus, in this sense, the concave property of T may be of particular interest if we are interested in studying the evolution of countries who have a smaller share of international flows.

The main shortcoming of the Herfindhal-Hirschman and the Theil entropy indices from our perspective is that they are sensitive to the number of observations, in the sense that if in period 0 the world is divided into two countries and each has a share of $1/2$ in world trade flows, then the index takes the value of 0.5; whereas, if in period 1, the world is divided into 3 countries which each has a $1/3$ share of world trade then the index takes the value of 0.33. This may be a desirable property, but it may be misleading in our case, since the number of countries also varies with the availability of data. Thus our last indicator is not sensitive to the number of observations in the sense that regardless of the number of countries in the sample, an equal share for each country does not affect the value of the indicator.

The last indicator is the Mean Logarithm deviation (L) which is given by:

$$L = \log\left(\frac{1}{n} \sum_i f_i\right) - \frac{1}{n} \sum_i \log(f_i) \quad (3)$$

where n is the number of countries. Note that L is a population-weighted indicator which implies that the indicators can be decomposed and the weights given to each group depend on the number of individual (countries) in each group.¹⁰

Note that regardless of the number of countries in the sample, when countries have an equal share in world flows, L takes the value of 0.

2.1.1 Non-zero-homogeneous concentration indices

The three concentration indices described above are homogeneous of degree 0 on total flows, or in other words, they are invariant to a change in the scale of the distribution. That is, an increase of 10% of the trade flow of each country leaves the index unaffected. We may also want to look at measure which are not zero-homogeneous, which captures the idea that it may be better to

have a small share of a large pie than a larger share of a smaller pie. Or alternatively, that a high concentration of international flows may be more burdensome in a world where few international transactions occur.

Bourguignon (1979) proposes two concentration indicators which are non-homogeneous and that generalize the Mean Logarithm Deviation Index and the Theil entropy coefficient. These are respectively given by L_α and T_α below:

$$\begin{aligned} L_\alpha &= \bar{f}^\alpha \left[\frac{1}{n} \sum_i \left(\frac{f_i}{\bar{f}} \right)^\alpha - 1 \right] \\ T_\alpha &= \bar{f}^\alpha \left[\frac{1}{n} \sum_i \left(\frac{f_i}{\bar{f}} \right)^{\alpha+1} - 1 \right] \end{aligned} \tag{4}$$

where $\bar{f}$ is the average flow across the world in a particular year; and $\alpha < 0$ is the degree of homogeneity. If $\alpha = -1$, this implies that an increase of 10% in all countries' flows will increase the value taken by the concentration coefficient by 10%. Note that as for L and T , L_α and T_α are the corresponding population-weighted and flow-weighted decomposable measures of concentration.

Some of the indicators proposed above have different upper and lower bounds; thus, as we are interested in the evolution through time of the level of concentration and not in the level itself, we report the results in respect of each index with a normalized value of 100 in the initial period. An increase in the value of the normalized concentration index corresponds to higher concentration whereas a fall of the normalized concentration index corresponds to less concentration.

¹⁰ See Bourguignon (1979) for a formal proof.

2.2 The Concentration of Flows from 1972 to 1995

Data are available from 1972 to 1995. Description of the data can be found in the appendix. To avoid year-specific fluctuations, all variables are taken as a 5-year moving average. Thus, our initial observation for 1976 corresponds to the average from 1972 to 1976, whereas the final observation for 1995 corresponds to the average from 1991 to 1995.

In section 2.1.1 we analyze the evolution of the concentration of trade flows, and section 2.1.2 we analyze the evolution of the concentration of investment flows.

2.2.1 The concentration of trade flows

Trade flows for country i are defined as the sum of exports (x_i) and imports (m_i) of country i , i.e. $f_i = x_i + m_i$. Figure 2 below illustrates the evolution of the concentration of trade flows 1976 to 1995 for the three zero-homogenous indicators, i.e. H , T and L . The evidence from figure 2 seems ambiguous. When regressing the three concentration indices on a time trend over the whole period, only L indicates a positive and significant correlation. H has a positive but insignificant correlation, whereas T has a negative and insignificant correlation.¹¹ However, in figure 2, an increase in trade flow concentration is observed in the late 1980s. The Herfindhal-Hirschman concentration index (H) suggests that trade concentration was relatively stable until the beginning of the 1990s and it has increased since then. In 1995, H was 20% higher than in 1976. A similar conclusion can be drawn from examining the evolution of the Mean Logarithm Deviation index; L was 17% higher in 1995 than in 1976. However, the Theil entropy coefficient seems to suggest that concentration has remained relatively stable through time.

Insert Here Figure 2: Trade Concentration from 1976 to 1995

As previously suggested, comparing the evolution of T and H may be of interest, given that the former is concave on trade shares and the latter convex. Thus, the fact that T is relatively constant through time and H increases by 20% over the period implies that the increase in trade

¹¹ All the regressions on a time trend are done using a Maximum Likelihood iterative technique.

concentration has not occurred among countries that have a small share of world trade, but among economies that have a large share of world trade. This information is important in itself, since it means that smaller trading partners are not necessarily becoming relatively smaller through time.

As discussed above, the three concentration indicators reported in figure 2 are homogenous of degree 0. Thus, the fact that Globalization has implied an important increase in world trade during the last two decades does not affect the concentration index. During this period real trade flows have increased by 135%. Had this increase in total trade flows been equally shared, and our concentration index L homogeneous of degree 1 (i.e. $\alpha = -1$), then the concentration index would have fallen by 118% ($118=135-17$), and trade flows would have been much less concentrated.

However, the increase in trade flows has not been equally shared as shown in figure 3 where L_α is reported for different values of α . When L_α is homogeneous of degree 1 (i.e. $\alpha = -1$), it appears that trade concentration falls by 25% during the period 1976-1995 (and not 118%). This was expected, and confirms the idea that if our concentration measure is not objective, in the sense that it accounts for increases in the size of world trade, then trade concentration falls throughout the period for any level of homogeneity larger than 0.25, as shown in figure 3. When regressing these three indicators on a time trend, we obtained that for homogeneity degrees of 0.5 and 1, the relationship is negative and significant, whereas for a degree of homogeneity of 0.25 the relationship is not significant.

Insert Here Figure 3: Trade Concentration and Trade Growth (L_α)

More clear-cut conclusions can be drawn from figure 4, where T_α is reported for different values of α . As T is constant through time, it is clear that as world trade has increased, world trade concentration has fallen for any T_α with a level of homogeneity larger than zero (i.e. $\alpha < 0$). This was confirmed when we regressed these three indicators on a time trend, as we obtained a negative and significant relationship for all three indicators.

Insert Here Figure 4: Trade Concentration and Trade Growth (T_α)

To summarize, trade concentration has apparently increased if we do not account for the significant increase in world trade throughout the period. This increase in inequality has occurred essentially among economies which have large shares of world trade. But, if one corrects the concentration indices to account for the increase in world trade, then trade concentration falls for any level of homogeneity larger than 0.25.

2.2.2 The concentration of investment flows

Investment flows of country i are defined as the sum of inward and outward Foreign Direct Investment (FDI), and inward and outward Portfolio Investment Abroad (PIA). Thus $f_i = FDI_i + FDI_o + PIA_i + PIA_o$, where subscripts i, o refer to inward and outward flows respectively.¹² To smooth the trends in investment flows, a moving average of these flows is also taken. Data are discussed in the appendix.

Figure 5 reports the evolution of H , T and L throughout the period. When regressing the three concentration indicators on a time trend, we found that H is negatively and significantly correlated with a time trend, whereas the other two are positively but not significantly correlated with the time trend. Thus, the evidence here is again ambiguous. The first indicator shows that financial flows tend to be less concentrated throughout the period whereas the other two indicators suggest that there has been no significant change in the concentration of financial flows between 1976 and 1995. Figure 5 shows that L has increased throughout the 1980s to a level 30% higher in 1989 than in 1976. From there on, L tends to fall to a level 20% higher in 1995 than in 1976. Thus, according to the concentration measure L , trade concentration increases until 1989 and falls thereafter but remains at a level 20% higher than in 1976. A similar trend can be observed for the Theil coefficient T , although the level of concentration in 1995 according to T is almost equal to the level existing in 1976. The Herfindhal-Hirschman concentration index shows a fall of 40% in the level of concentration throughout the period, again with an increase during the 1980s.

Insert Here Figure 5: investment Concentration from 1976 to 1995

¹² FDI represents between 25% and 45% of total flows throughout the period.

As with trade concentration, it is useful to compare the evolution of T and H , given that the former is concave on the investment flows shares, whereas the latter is convex. Thus, the fact that T has remained constant, while H has fallen, tends to indicate that the fall in the concentration of investment flows has essentially occurred among countries that had a large share of world flows. This is the mirror image of what has happened with trade flows, as discussed in the previous section.

If the picture looks somewhat ambiguous, the ambiguity disappears when we allow the concentration index to take account of the large increase in world investment flows that has occurred (real world investment flows have increased by 794% over the period). As reported in Figures 6 and 7, the concentration of investment flows falls for any level of homogeneity larger than 0.25 in the concentration indices L_α and T_α . This is confirmed when regressing these six indicators on a time trend (except for $L_{0.25}$, where the relationship is negative but insignificant).

Insert Here Figures 6 and 7

To summarize, the evolution of the concentration of investment flows is relatively ambiguous and depends on the indicator that is chosen. However, it appears that the level of concentration has fallen among countries that had a large share of world investment flows. Moreover, if we correct the concentration indicators to account for the increase in investment flows at the world level, then the concentration of investment flows has fallen regardless of the concentration measure we use.

Thus, contrary to what has been sometimes suggested, it appears that the increase in world trade and investment flows has not (only) been limited to a few countries. Before drawing more conclusions, we consider whether the marginalization of some countries may be explained by domestic policies. We measure the evolution of the concentration of international flows among two set of countries: rapid and slow integrating economies (i.e. rapidly opening and slowly opening economies) This is done in section 5. First, in section 4, we build a trade and investment openness indicator to classify countries into rapidly and slowly integrating economies.

3 Rapid and Slow Integrating economies: 1972-1995

Many authors have already done the kind of country classification contemplated here, so one may wonder why we should repeat the exercise again. At least two reasons can be given: first, for internal consistency within the paper; second, because the classic openness indicators have been criticized on several grounds and we will try to correct at least for some of these critiques.¹³

In subsection 3.1 we build the openness indicator for trade and in subsection 3.2 we focus on international investment flows.

3.1 International Trade Openness Indicator

The basic trade openness indicator we are using is the classic ratio of trade to GDP. Thus for country i this is given by:

$$TI_i = \frac{x_i + m_i}{GDP_i} \quad (5)$$

where TI_i is the basic trade openness indicator in country i and GDP_i is the Gross Domestic Product of country i .

As one is interested in real effects and not price effects, all these variables are estimated in constant 1987 dollars. This controls for changes in trade to GDP ratios that are merely due to changes in dollar prices. This is of particular importance for countries that trade goods which have a high volatility of prices and countries with high inflation. Similarly, GDP in different countries is estimated in 1987 US prices so that we do not underestimate the GDP of low-price countries. This is done using the World Bank purchasing power parity index.¹⁴ Finally, all

¹³ An exception is Dollar (1992) which uses as an openness indicator deviations from real exchange rate and then corrects it for the size of the country.

¹⁴ To illustrate how differences in domestic prices may affect GDP measures, take the case of Switzerland which has a GDP/capita which is 35% higher than in the United States when measured at Swiss prices, but only 0.7% higher when measured at US prices.

variables are again taken as a 5-year moving average from 1976 to 1995 to control for year-specific exogenous shocks. This allows us to focus on main trends.

We correct the basic trade openness indicator to account for differences in country size and levels of development. Indeed, it has often been argued that large countries in terms of GDP and/or population tend to trade less, as there is larger scope for trade within the country.¹⁵ Similarly, it has been argued that countries with high level of GDP/capita may also be biased toward having a lower level of trade to GDP ratio.¹⁶ The reason is that as countries develop, the share of the service sector tends to increase, and the service sector is largely non-tradable. To account for differences in country size and levels of development, we considered the following regression:

$$\ln(TI_{i,t}) = \beta_0 + \beta_1 \ln(GDP_{i,t}) + \beta_2 \ln(GDP_{i,t})^2 + \beta_3 \ln(pop_{i,t}) + \beta_4 \ln(pop_{i,t})^2 + \beta_5 \ln(GDP_{i,t}/pop_{i,t}) + \beta_6 \ln(GDP_{i,t}/pop_{i,t})^2 + \varepsilon_{i,t}$$

where subscript i is for countries and t for time; the squared terms control for possible u-type relationships (this may occur, for example, if as economies get richer the services sector share becomes larger, but also at very high levels of development (high GDP/capita) economies start trading services and therefore the non-tradable sector becomes smaller). Obviously, the regression cannot be run as such due to multicollinearity problems. Also the squared of the population turned out to be insignificant (though it had the correct negative sign). Thus the constrained regression we run in panel (2540 observations) is given by:¹⁷

$$\ln(TI_{i,t}) = \gamma_0 + \gamma_1 \ln(GDP_{i,t}) + \gamma_2 \ln(GDP_{i,t})^2 + \gamma_3 \ln(pop_{i,t}) + \gamma_4 \ln(GDP_{i,t}/pop_{i,t})^2 + \varepsilon_{i,t}$$

¹⁵ As an extreme example, assume a two-country world composed of Uruguay and a second country which represents the rest-of-the world. It is then clear that Uruguay will have a much larger trade to GDP ratio than the rest-of-the-world, as the latter can easily trade a substantial amount of goods internally which will not correspond to international trade under our assumption.

¹⁶ See for example IMF (1997), p. 46.

¹⁷ We also ran a further constrained regression by putting the GDP that appears on the left hand side (recall that TI includes GDP) on the right hand side. Results were statistically significant at the 99% level and equal to those reported in table 1.

where $\gamma_0 = \beta_0$, $\gamma_1 = \beta_1 + \beta_5$, $\gamma_2 = \beta_2$, $\gamma_3 = \beta_3 - \beta_5$ and $\gamma_4 = \beta_6$. Results of plain OLS estimator are reported in table 1.¹⁸

Insert Here Table 1: Correcting the trade openness indicator

The coefficients tend to have the expected signs and indicate that trade openness falls with population and that the relationship between openness and GDP and GDP/capita has a u-shape. That is, for small levels of GDP and GDP/capita, the higher the GDP or the GDP/capita the lower the level of openness. This confirms our predictions. For sufficiently high levels of GDP and GDP/capita, the relationship is reversed. In the case of GDP/capita, this may be explained by the fact that once a country becomes sufficiently rich it also starts to trade services, as argued before. Because of the constraints due to multicollinearity, it is impossible to identify at which levels of GDP and GDP/capita the relationship changes. However, as the coefficient of the squared GDP term is relatively small, we presume that this occurs at relatively high levels of GDP, whereas as the coefficient of the squared GDP/capita term is relatively large, the relationship changes at relatively low levels of GDP/capita.¹⁹ In sum, results tend to confirm that larger and poorer countries tend to trade less.

We then construct the fitted value of TI from the above regression, which tells us what is the "normal" degree of openness of a country with a given GDP and GDP/capita. That is:

$$\hat{TI}_{i,t} = \exp[\log(TI_{i,t}) - \varepsilon_{i,t}] \quad (6)$$

Finally, our corrected trade openness indicator, denoted by TI^* , is given by:

$$TI_{i,t}^* = \frac{TI_{i,t}}{\hat{TI}_{i,t}} \quad (7)$$

¹⁸ Similar results were obtained using within and between estimators. We opted for a plain OLS estimators since both the within and between estimators capture partly what we want to keep in the error term (see below).

¹⁹ This was confirmed when we regressed the TI on GDP, population and GDP/capital in turn. The relationship between TI and population is log-linear and negative, whereas for GDP and GDP/capita it has a u-shape and reaches its minimum at a level of GDP of 1.3 trillion dollars (very high) and at a level of GDP/capita of 1200 dollars (relatively low).

Thus, the corrected trade openness indicator TI^* tell us what the openness deviation is of country i with respect to the “normal” openness of a country with the same GDP, population and GDP/capita. If $TI^* > 1$, then country i is more open than average, whereas if $TI^* < 1$ country i is more close than average.

As we are interested in the evolution through time of countries’ openness we calculate the rate of trade integration between 1976 and 1995. This is given by:

$$RTI_i = \frac{TI_{i,1995}^*}{TI_{i,1976}^*} \quad (8)$$

Thus when $RTI_i < 1$, the country has become more open in the period 1976-1995 whereas when $RTI_i > 1$, the country has tended to become less open during the given period. To correct for the fact that highly open economies in the initial period (i.e., 1976) may experience more difficulty in furthering open their economies than countries that were relatively closed in 1976, we run the following regression:

$$\log(RTI_i) = \alpha + \beta_i \log(TI_{i,1976}^*) + \varepsilon_i$$

Thus, we control for the initial degree of openness by running the above OLS regression across countries (112 observations). The results can be found in table 2.

Insert here table 2

We now build the corrected rate of trade integration indicator by taking the fitted value of the above regression ($\hat{RTI}_i$) and comparing it with the actual value of RTI_i . Thus, the corrected rate of trade integration, denoted by RTI_i^* is given by:

$$RTI_i^* = \frac{RTI_i}{\hat{RTI}_i} \quad (9)$$

Thus, when $RTI_i^* > 1$, country i has been opening more quickly than the average country with the same level of trade openness in 1976. Table 4 reports the ranking of countries according to RTI_i^* . Table 3 also reports the classification of countries into fast trade integrating countries and slow trade integrating countries according to whether RTI_i^* is larger or smaller than one. This will allow us in section 5 to calculate the evolution of trade concentration among fast and slow trade integrating countries.

Insert here table 3

3.2 International Investment Openness Indicator

The basic investment openness indicator we are using is the classic ratio of international investment flows to GDP. Thus for country i this is given by:

$$II_i = \frac{FDI_i + FDI_o + PIA_i + PIA_o}{GDP_i} \quad (10)$$

where II_i is the basic investment openness indicator in country i .

To classify countries into fast and slow investment integrating countries we proceed in the same way as for trade integration.

We first control for size and GDP/capita. Results of the constraint regression are given in Table 4. As for trade openness, the larger the population of a country, the lower its level of investment openness. The relationship between investment openness and GDP and GDP/capita is also u-shaped. Thus for low levels of GDP and GDP/capita, the higher GDP or GDP/capita, the lower the level of investment openness, whereas for high levels of GDP and GDP/capita, the relationship is reversed.

Insert here table 4

We then build the corrected investment openness indicator, denoted $II_{i,t}^*$, which is given by

$$II_{i,t}^* = \frac{II_{i,t}}{\hat{II}_{i,t}} \quad (11)$$

where $\hat{II}_{i,t}$ is the fitted value of $II_{i,t}$.

As in the case of trade, we are interested in the evolution through time of the level of investment openness so we build an indicator of the speed of investment integration, denoted RII_i , which is given by:

$$RII_i = \frac{II_{i,1995}^*}{II_{i,1976}^*} \quad (12)$$

As before, we corrected RII_i for the initial condition by running the OLS regression of RII_i on $II_{i,1976}^*$. Results are reported in Table 5.

Insert here table 5

From there we build the corrected rate of investment integration indicator, RII_i^* which is given by:

$$RII_i^* = \frac{RII_i}{\hat{RII}_i} \quad (13)$$

where $\hat{RII}_i$ is the fitted value of the regression reported in Table 5.

Table 6 reports the ranking of countries according to RII_i^* and classifies them into fast and slow investment integrating countries.

Insert here table 6

4 The Concentration of International Trade and investment Flows among Fast and Slow Integrating Economies

In the previous section we classified countries into fast and slow integrating countries. This allows us to decompose our sample into these two categories. In order to capture the idea that domestic policies rather than Globalization itself have been the cause of the decline of some countries in terms of trade and investment shares, we will calculate the different concentration indices presented in section 2 with respect to these two sets of countries.

4.1 Trade and Investment Concentration among fast integrating countries

Figures 8 and 9 show the evolution of the trade and investment concentration indices over the period 1976-1995 for fast integrating countries. It appears that both trade and investment concentration levels have fallen between 1976 and 1995 for fast integrating countries. When regressing these six concentration indices on a time trend, we obtained a negative and significant correlation at the 99% level for two of the trade concentration indices (H and T) and a negative and significant correlation at the 90% level for the remaining indicator L . Concerning investment flows, the correlation is negative and statistically significant at the 99% level for L , negative and significant at the 90% level for T , and negative but insignificant for H .

One should note that there has been an increase in the investment concentration indices during the period 1985-1990 (this may be due to the early 80's debt crisis). But the final level in 1995 of all three indices is lower than in 1976. The fall in the trade concentration indices has been almost monotonic to reach a level of trade concentration 20% lower according to the Herfindhal-Hirschman index in 1995 than in 1976 (8% and 5% according to the Theil coefficient and Mean Logarithm deviation respectively).

Insert here figures 8 and 9

4.2 Trade and Investment Concentration among slow integrating countries

All concentration indices for both trade and investment show that concentration in trade and investment flows have increased over the period 1976-1995, as shown in Figures 10 and 11. This is confirmed when regressing the six indicators on a time trend as they are all positively and significantly correlated at the 99% level with the time trend (except for L in the case of financial flows, which is negatively and significantly correlated at the 90% level).

Insert here figures 10 and 11

A comparison of figures 8 to 11 suggests that if trade and investment flows may be more concentrated at the world level, this may be simply explained by the fact that some countries remain relatively closed and do not participate in the Globalization process. Thus, Globalization does not inherently create marginalization. Rather, countries marginalize themselves.

5 Concluding Remarks

The aim of this paper was to determine whether trade and financial flows have tended to be concentrated among a few countries during the period 1972-1995. The indicators of concentration that we have used in this paper tend to indicate that there has been no clear trend towards more concentrated trade and investment flows. Moreover, when the concentration indicators are adjusted to take account of the increase in world financial and trade flows (i.e., for the size of the pie), it appears that both trade and financial flows are less concentrated today than in the early 1970s.

We ranked countries into fast and slow-integrating countries and calculated the various concentration indicators for each of these groups of countries. It appears that the concentration of trade and financial flows has fallen among rapidly integrating countries, whereas it has increased among slow-integrating countries. We argue this shows that marginalization of individual countries from world markets can be mostly explained by inward-looking domestic policies and therefore that marginalization is not inherent to the globalization process.

Bibliography

Amjadi, A., U. Reinke and A. Yeats (1996), "Tariffs, nontariff measures and transport barriers facing Sub-Saharan Africa's exports: an assesment of the potential impact of positive OECD trade policies", mimeo, IECIT, The World Bank.

Bourguignon, F. (1979), "Decomposable Income Inequality Measures", *Econometrica* **47**, 901-920.

Dollar (1992), "Outward-oriented developing economies really do grow more rapidly: Evidence from 1976-1985", *Economic Development and Cultural Change*, **40**, 523-544.

IFC (1997), *Foreign Direct Investment*, number 5.

IMF (1997), *World Economic Outlook*, May 1997.

UNCTAD (1997), "Transnational Corporations, Market Structure and Competition Policy", *World Investment Report*, July 1997.

UNIDO (1996), *The Globalization of Industry*.

WTO (1997), *Annual Report*, vol. II.

Data Appendix

Trade, GDP and population data is from the World Development Indicators of the World Bank and covers the period from 1972 to 1995. Trade and GDP are provided in 1987 dollars and GDP is calculated in purchasing power parity using World Bank data. International investment data is IFS data from the IMF for the same period. All variables are calculated using a 5 year moving average to avoid year fluctuations.

**Figure 1: Sub-Saharan Countries Shares of World Trade and Investment Flows
1976-1995**

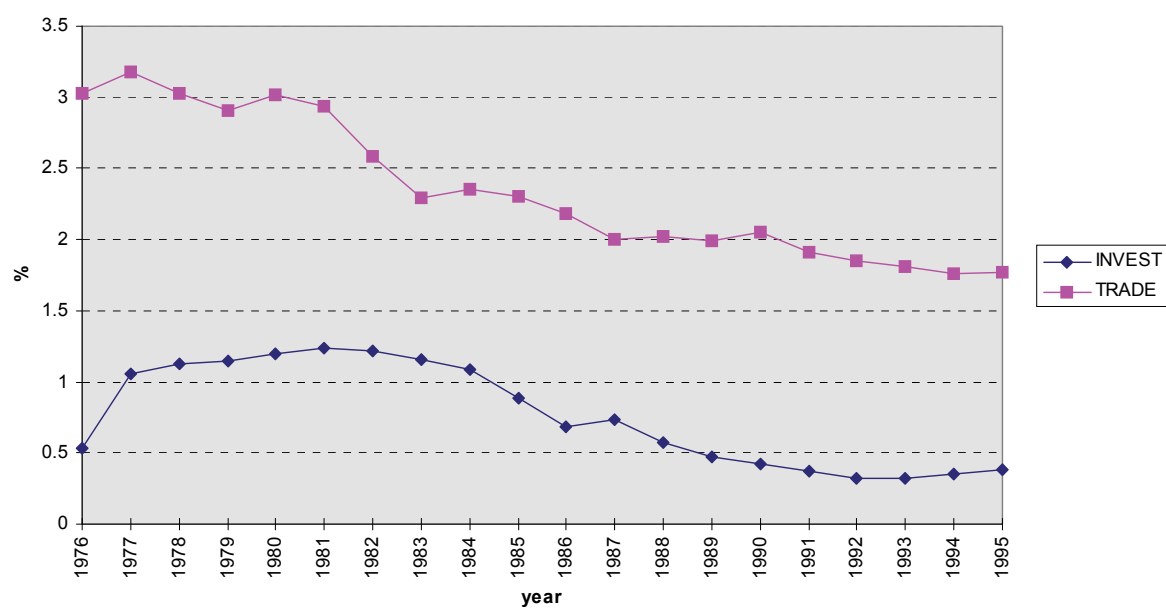


Figure 2: Trade Concentration 1976-1995

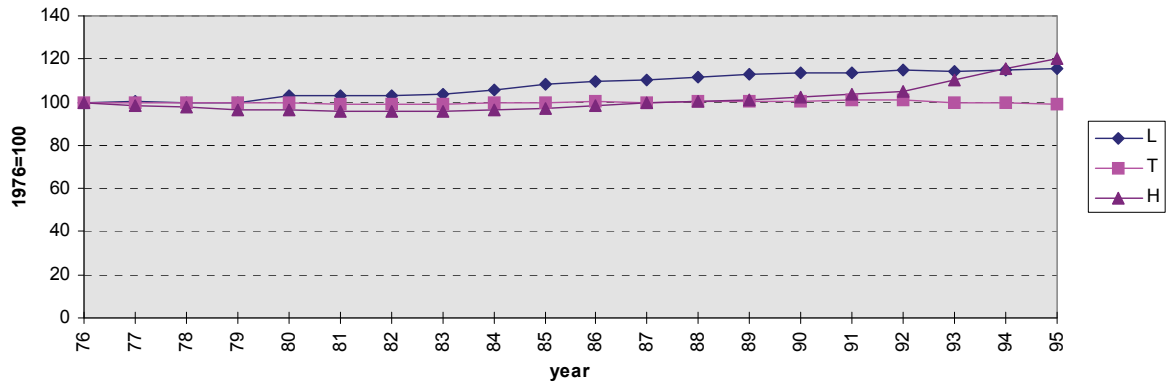


Figure 3: Trade concentration-Mean Logarithm deviation

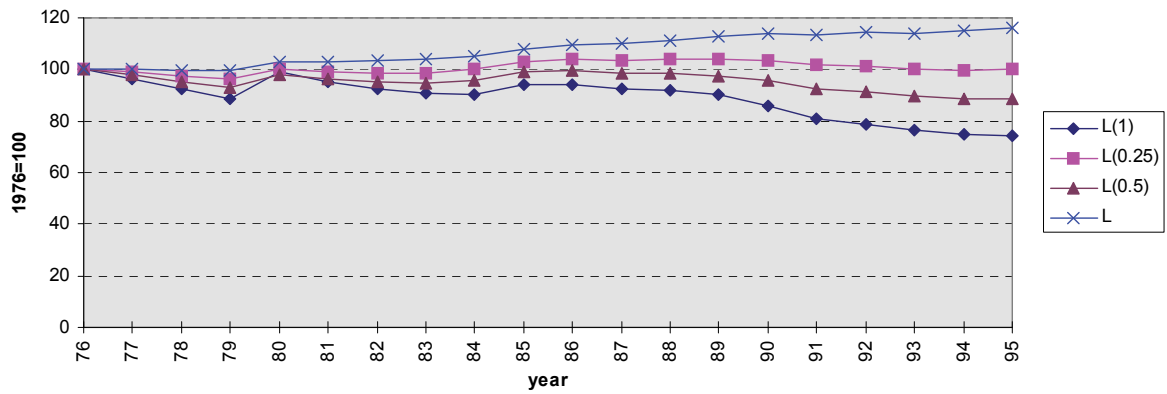


Figure 4: Trade concentration-Theil's coefficient

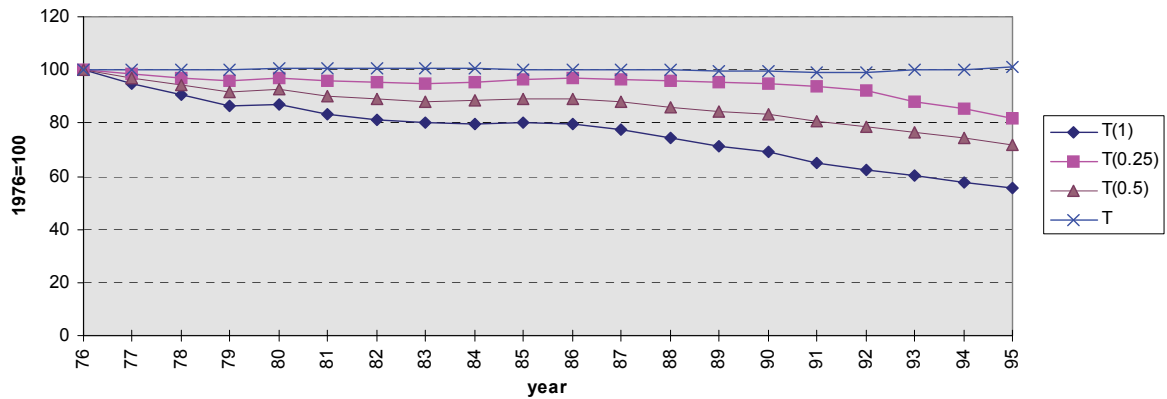


Figure 5: Financial Flows Concentration 1976-1995

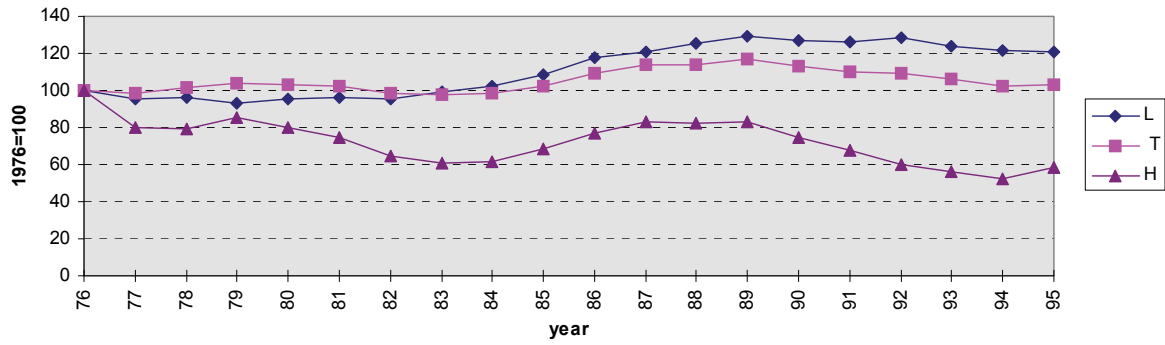


Figure 6: Financial Flows concentration-Mean Logarithm deviation

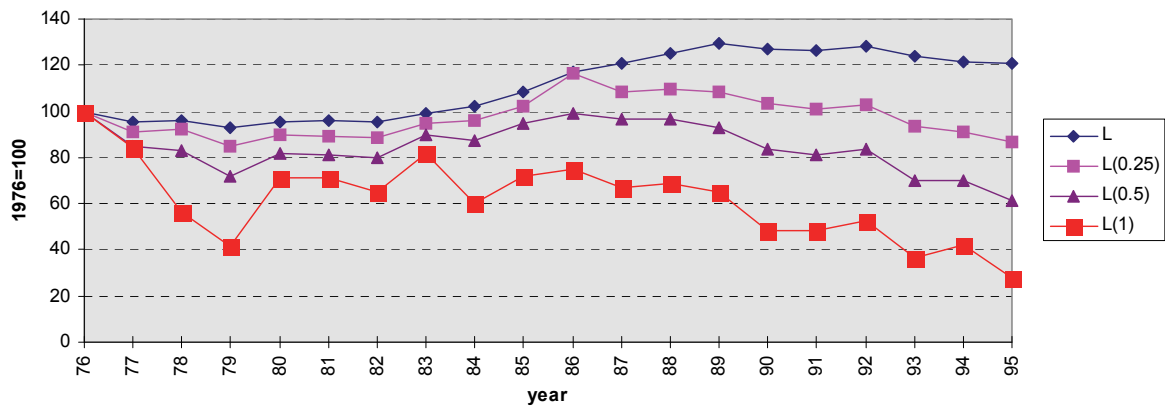


Figure 7: Financial Flows concentration-Theil coefficient

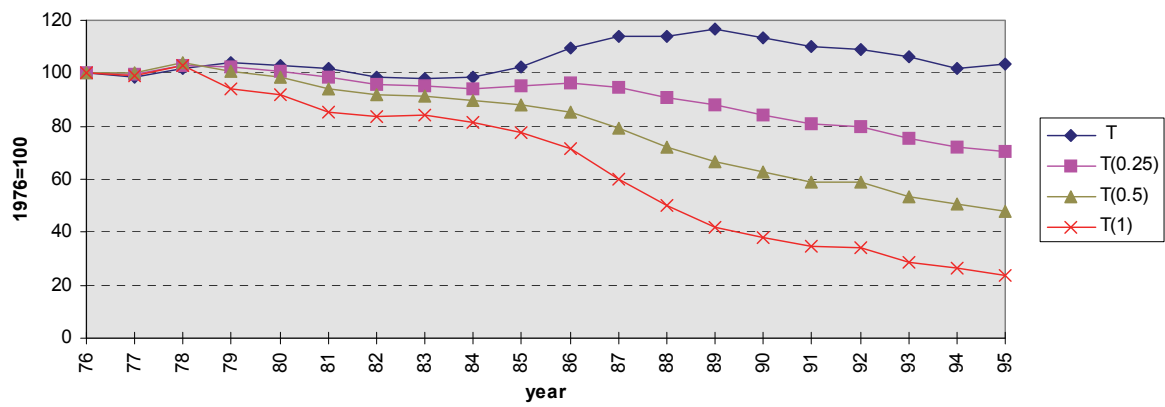


Figure 8: Fast trade integrating countries-trade concentration 1976-1995

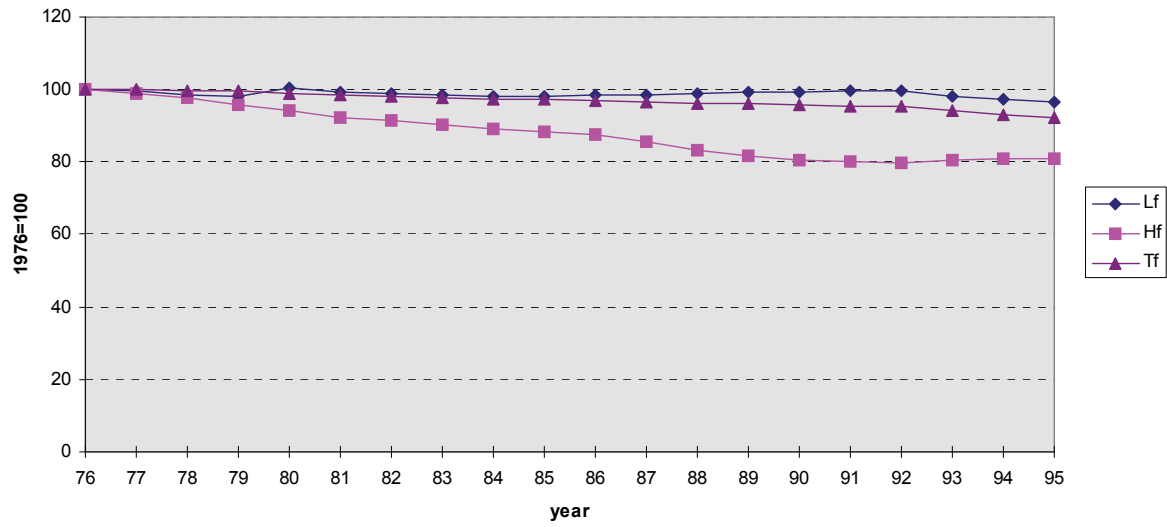


Figure 9: Fast investment integrating countries-investment concentration 1976-1995

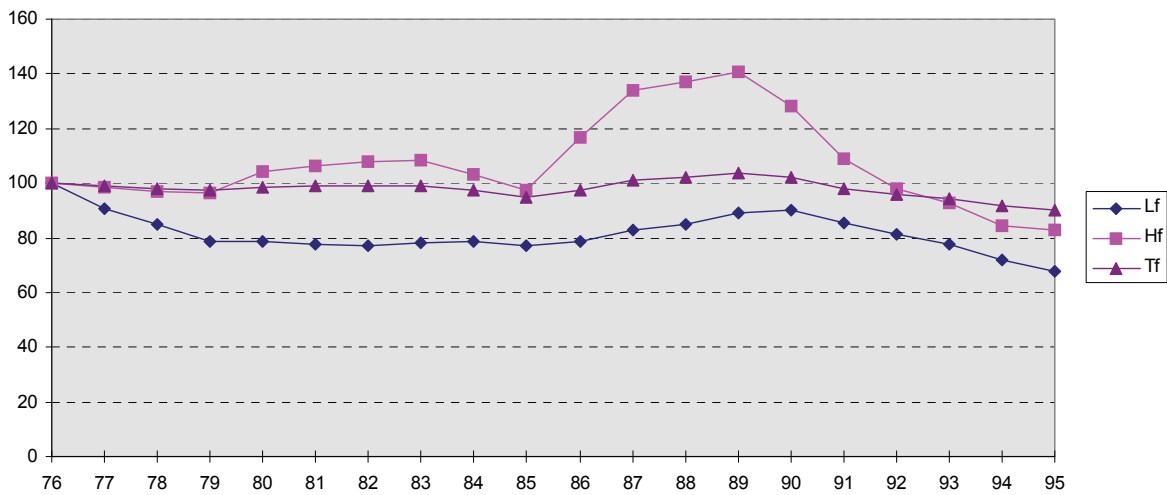


Figure 10: Slow trade integrating countries-trade concentration 1976-1995

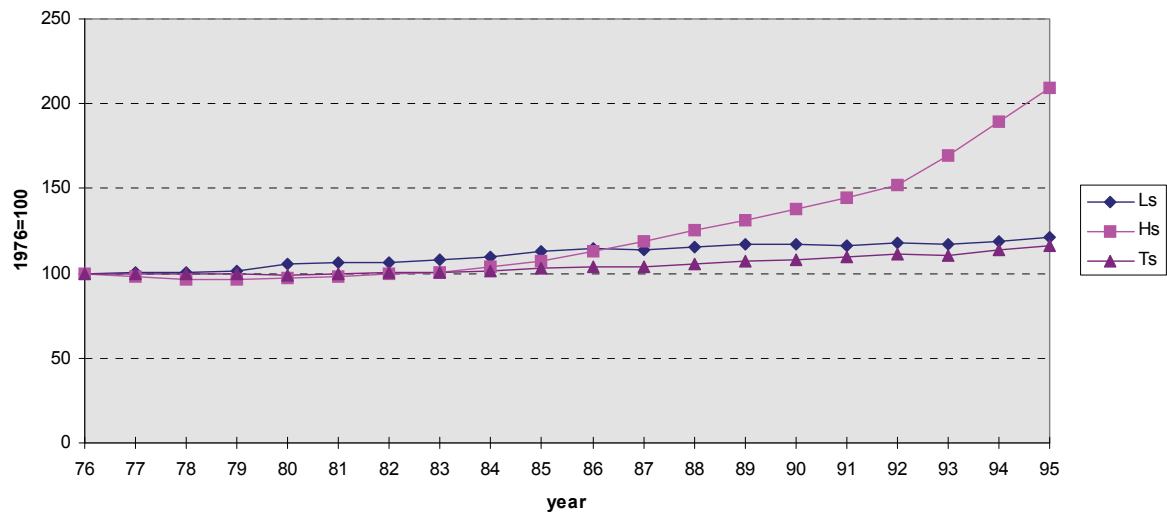
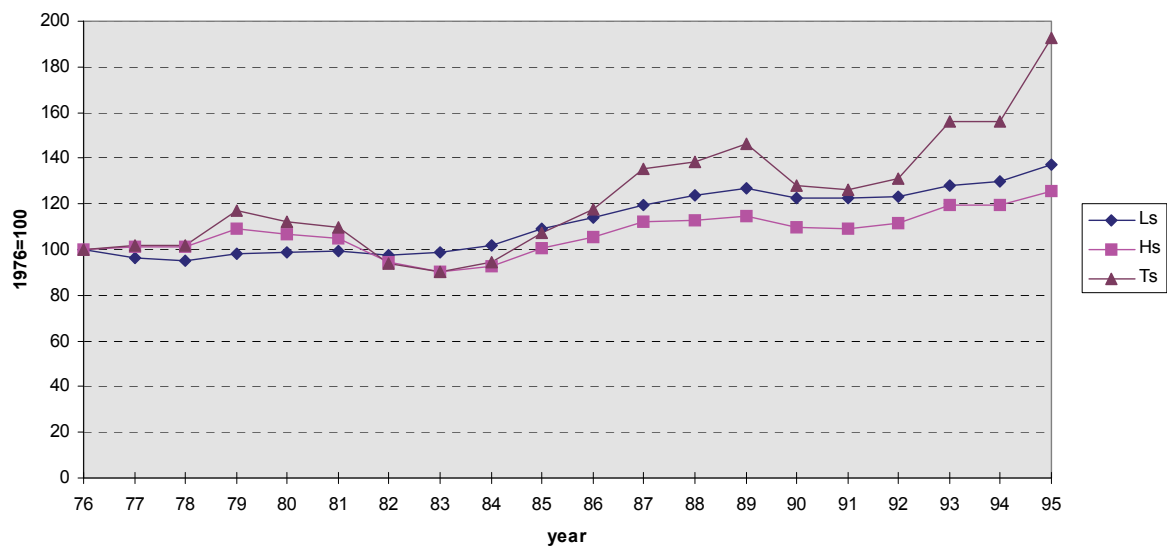


Figure 11: Slow investment integrating countries-investment concentration 1976-1995



Tables

Table 1. Correcting the trade openness indicator

Exogenous variables	Endogenous variable: ln TI
constant	2.49 (11.4)
ln GDP	-0.22 (-5.3)
ln POP	-0.34 (-17.6)
ln GDP ²	0.01 (5.9)
ln (GDP/POP) ²	0.14 (18)
adjusted-R ² :	0.57
Standard error of regression:	0.55
Observations:	2425

Note. T-statistics in parentheses.

Table 2: Correcting for the initial value of RTI

Exogenous variables	Endogenous variable: ln RTI
constant	0.06 (1.76)
ln TI* ₁₉₇₆	-0.37 (-6.0)
adjusted-R ² :	0.25
Standard error of regression:	0.37
Observations:	104

Note. T-statistics in parentheses.

Table 3: Ranking of rates of trade integration between 1976 and 1995

Rank	Country	TIC 95 over tic 76		Speed of integration	
		Value	Rank	Value	rank
1	Swaziland	1.83	13	2.1	1
2	Paraguay	2.49	2	1.9	2
3	Philippines	2.24	4	1.88	3
4	Trinidad & Tobago	3.12	1	1.85	4
5	Malaysia	1.64	19	1.81	5
6	Cote d'Ivoire	1.64	18	1.69	6
7	Haiti	1.83	12	1.68	7
8	Gabon	1.92	9	1.66	8
9	Hong Kong	1.34	35	1.64	9
10	China *	1.99	5	1.62	10
11	Greece	1.94	8	1.61	11
12	South Africa	1.04	61	1.61	12
13	Poland	1.87	10	1.57	13
14	Jamaica	1.5	23	1.54	14
15	Mali	1.86	11	1.52	15
16	Mexico	1.97	6	1.41	16
17	Belgium	1.09	54	1.35	17
18	Chinese Taipei	0.91	77	1.35	18
19	Ireland	1.21	43	1.35	19
20	Netherlands	1.1	50	1.35	20
21	Canada	1.5	24	1.31	21
22	Spain	1.57	22	1.28	22
23	Costa Rica	1.69	16	1.27	23
24	Germany	1.1	49	1.26	24
25	Argentina	2.31	3	1.25	25
26	El Salvador	1.37	33	1.24	26
27	Singapore	0.81	81	1.24	27
28	Cameroon	1.59	21	1.24	28
29	Senegal	1.39	30	1.23	29
30	Zimbabwe	1.44	28	1.22	30
31	Papua New Guinea	1.17	44	1.21	31
32	India	1.46	26	1.2	32
33	Thailand	1.29	38	1.19	33
34	Korea, Republic of	1.01	67	1.18	34
35	Bangladesh	1.96	7	1.18	35
36	Sweden	1.16	45	1.17	36
37	Austria	1.22	42	1.17	37
38	Turkey	1.38	31	1.16	38
39	Uruguay	1.74	15	1.15	39
40	Switzerland	1.29	39	1.14	40
41	Nicaragua	1.79	14	1.13	41
42	Chad	1.07	57	1.12	42

43	Tunisia	1.25	41	1.11	43
44	Colombia	1.68	17	1.09	44
45	Dominican Republic	1.36	34	1.08	45
46	France	1.1	52	1.05	46
47	Chile	1.38	32	1.05	47
48	Cyprus	1.03	63	1.02	48
49	Congo	0.92	75	1.01	49
50	United Kingdom	1.05	60	1.01	50
51	New Zealand	1.4	29	1.01	51
52	Finland	1.06	59	1	52
53	Israel	1.09	53	1	53
54	Morocco	1.08	56	1	54
55	Australia	1.31	37	0.99	55
56	Kenya	0.91	76	0.99	56
57	Denmark	1.01	66	0.99	57
58	Portugal	1.15	47	0.99	58
59	Guyana	0.58	100	0.99	59
60	Italy	1.03	62	0.99	60
61	Sri Lanka	1.25	40	0.98	61
62	Panama	1.15	46	0.97	62
63	Brazil	1.31	36	0.97	63
64	Nigeria	0.8	82	0.97	64
65	Hungary	0.99	70	0.97	65
66	United States	1.44	27	0.96	66
67	Gambia, The	1.07	58	0.95	67
68	Honduras	0.98	73	0.94	68
69	Romania	0.7	94	0.94	69
70	Mauritania	1	69	0.94	70
71	Burundi	1.48	25	0.93	71
72	Malta	0.68	95	0.91	72
73	Ecuador	1.01	65	0.89	73
74	Togo	1.11	48	0.87	74
75	Venezuela	1.09	55	0.86	75
76	Lesotho	1.1	51	0.84	76
77	Cape Verde	0.88	78	0.84	77
78	Malawi	0.93	74	0.81	78
79	Burkina Faso	1.03	64	0.81	79
80	Kuwait	1.61	20	0.81	80
81	Guatemala	0.99	72	0.8	81
82	Pakistan	1	68	0.79	82
83	Bolivia	0.99	71	0.79	83
84	Indonesia	0.73	90	0.77	84
85	Luxembourg	0.8	85	0.75	85
86	Ghana	0.85	79	0.73	86
87	Madagascar	0.74	89	0.72	87
88	Syrian Arab Republ	0.56	102	0.72	88

89	Japan	0.8	84	0.71	89
90	Egypt, Arab Rep. o	0.65	96	0.71	90
91	Peru	0.8	83	0.7	91
92	Zambia	0.58	99	0.69	92
93	Norway	0.6	98	0.69	93
94	Central African Re	0.84	80	0.65	94
95	Niger	0.7	92	0.63	95
96	Algeria	0.64	97	0.63	96
97	Sudan	0.7	93	0.6	97
98	Benin	0.72	91	0.6	98
99	Guinea-Bissau	0.8	86	0.54	99
100	Mauritius	0.79	88	0.54	100
101	Iran, Islamic Rep.	0.38	104	0.44	101
102	Sierra Leone	0.5	103	0.42	102
103	Iraq	0.31	105	0.34	103
104	Bulgaria	0.18	106	0.2	104

Table 4: Correcting II for GDP and GDP/capita

Exogenous variables	Endogenous variable: ln II
constant	1.5 (2.4)
ln GDP	-0.50 (-4.1)
ln POP	-0.66 (-10.8)
ln GDP ²	0.04 (6.2)
ln (GDP/POP) ²	0.23 (9.4)
adjusted-R ² :	0.35
Standard error of regression:	1.39
Observations:	1918

Note. T-statistics in parentheses.

Table 5: Correcting for the initial value of RII

Exogenous variables	Endogenous variable: ln RII
constant	0.78 (4.7)
ln II* ₁₉₇₆	-0.75 (-7.8)
adjusted-R ² :	0.48
Standard error of regression:	1.32
Observations:	66

Note. T-statistics in parentheses.

Table 6: Ranking of countries according to rate of integration indicator

Ranking	country	Value of RII*
1	BOLIVIA	22.81
2	GUYANA	13.83
3	ARGENTINA	5.71
4	BELGIUM +LUX	5.36
5	SWAZILAND	5.28
6	SOUTH AFRICA	4.13
7	PAPUA NEW GUINEA	3.85
8	JAMAICA	3.27
9	POLAND	3.03
10	SPAIN	3.00
11	TURKEY	2.94
12	BRAZIL	2.91
13	THAILAND	2.77
14	DENMARK	2.57
15	UNITED KINGDOM	2.46
16	SRILANKA	2.46
17	CHILE	2.23
18	SWEDEN	2.11
19	NETHERLANDS	2.06
20	FINLAND	2.01
21	PARAGUAY	1.91
22	PAKISTAN	1.87
23	PORTUGAL	1.79
24	NEWZEALAND	1.77
25	FRANCE	1.74
26	EGYPT	1.60
27	ITALY	1.54
28	ECUADOR	1.43
29	MALAYSIA	1.39
30	KOREA	1.37
31	COLOMBIA	1.36
32	IRELAND	1.30
33	SINGAPORE	1.18
34	AUSTRIA	1.16
35	CANADA	1.15
36	HONDURAS	1.13
37	NIGER	1.03
38	RWANDA	0.99
39	MOROCCO	0.98
40	AUSTRALIA	0.91
41	KUWAIT	0.83
42	ISRAEL	0.74

43	TUNISIA	0.69
44	UNITED STATES	0.68
45	COTE D IVOIRE	0.67
46	MALI	0.66
47	VENEZUELA	0.64
48	TRINIDAD AND TOBAGO	0.62
49	GHANA	0.57
50	DOMINICAN REPUBLIC	0.56
51	GREECE	0.51
52	CYPRUS	0.45
53	SIERRA LEONE	0.45
54	SENEGAL	0.43
55	EL SALVADOR	0.38
56	MALTA	0.36
57	SEYCHELLES	0.31
58	NORWAY	0.30
59	SAUDI ARABIA	0.24
60	KENYA	0.13
61	MAURITIUS	0.13
62	MAURITANIA	0.11
63	BURKINA FASO	0.08
64	TOGO	0.06
65	BAHRAIN	0.03
66	GERMANY	0.01