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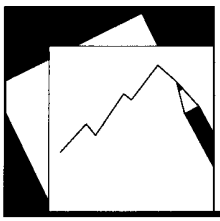

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Changing Nature of North-South Linkages: Stylized Facts and Explanations

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Changing Nature of North-South Linkages: Stylized Facts and Explanations

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Abstract

This paper examines the changing nature of growth spillovers between developed economies, the North, and developing countries, the South, driven by the process of globalization—the phenomenon of rising international trade and financial flows. We use a comprehensive database of macroeconomic and sectoral variables for 106 countries over the period 1960–2005. We consider the South to be composed of two groups of countries, the Emerging South and the Developing South, based on the extent of their integration into the global economy. Using a panel regression framework, we find that the impact of the Northern economic activity on the Emerging South has declined during the globalization period (1986–2005). In contrast, the growth linkages between the North and Developing South have been rather stable over time. Our findings also suggest that the North and Emerging South economies have started to exhibit more intensive *intra-group* growth spillovers.

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"Emerging economies are driving global growth and having a big impact on developed countries...As these newcomers become more integrated into the global economy and their incomes catch up with the rich countries, they will provide the biggest boost to the world economy since the industrial revolution." The Economist, September 16, 2006

I. INTRODUCTION

Profound changes have been taking place in the global economy over the past two decades. First, trade and financial linkages between developed countries, the North, and developing countries, the South, have become much stronger. Second, a number of developing countries have differentiated themselves from the others in the South by growing at an extraordinary pace while rapidly integrating themselves into the global economy. Moreover, some of these developing economies have become increasingly important players in the global economy as they have begun to account for a substantial share of the world output.[2]

Understanding the implications of these changes is important for the design of macroeconomic policies and theoretical models. Deeper trade and financial integration between the North and South can generate faster cross-border transmission of macroeconomic fluctuations, and therefore, can have implications for international coordination of economic policies. In regards to the theory, a better understanding of international economic linkages could be helpful in the design of dynamic models that can replicate the changing nature of linkages between the North and South.

In light of these considerations, the objective of this paper is to provide a comprehensive analysis of the changing nature of growth spillovers between the developed economies of the North and the developing countries of the South. In particular, we address the following questions: First, how have the economic linkages between the North and South changed over time? Second, what are the implications of these changes for the transmission of macroeconomic fluctuations across these groups? Third, how have the dynamics of growth spillovers between the North and South been affected by the changes in international linkages?

As we review in Section II, there has been a growing empirical research program analyzing the linkages between the developed economies of the North and the developing countries of the South. Our study contributes to this research program along several dimensions. First, to have a better understanding of the changing nature of linkages between these two groups, we examine sectoral interactions in addition to the conventional macroeconomic channels of

[2] These changes have been the subject of several articles in the media, as the quote at the top of this page and following examples show: *"The new prominence of emerging markets represent a sharp departure from the flurry of financial crises that tore through Mexico, Asia, and Russia in the 1990s…"* (USA Today, February 8, 2007); and *"the idea that the world economy was being pushed along in an American supermarket trolley was always an exaggeration… The difference now is that the rest of the world is doing more of the carrying…"* (The Economist, February 24, 2007). In addition, these changes have recently been at the center of an intensive debate about whether emerging market economies can decouple from the slowing of the U.S. economy (see Helbling and others, 2007, and Dées and Vansteenkiste, 2007).

interdependence. The earlier literature on the North-South linkages has mostly focused on the channels of transmission considering fluctuations in the standard macroeconomic aggregates, such as output, consumption, and investment. The sectoral analysis allows us to study the implications of dramatic shifts across industry, service, and agriculture sectors that have taken place over the past two decades.

Second, we employ a comprehensive dataset of 106 countries covering the 1960–2005 period. Considering the changes that have taken place over this period, we analyze the North-South linkages in three distinct sub-periods. The first period of 1960–72 corresponds to the Bretton Woods fixed exchange rate regime. The second period of 1973–85 is associated with a number of common shocks, including sharp fluctuations in the price of oil in the 1970s and contractionary (and highly synchronous) monetary policies in major industrial economies in the early 1980s. Finally, the third period, 1986–2005, represents the globalization era where there has been a substantial increase in the volume of trade and financial flows. By opening their trade and capital accounts during the globalization period, a number of emerging market economies have differentiated themselves from other developing countries in the South.[3] This observation is directly related to our third contribution, as discussed below.

Unlike the traditional North-South literature, we consider the South to be composed of two groups of countries, labeled as the Emerging South and the Developing South, based on the extent of their integration into the global economy. In particular, we divide the world (106 countries) into three groups of countries. The North is composed of 23 "core" OECD countries, the Emerging South includes 23 emerging markets, and the Developing South contains 60 developing countries.

In Section III, we examine how the size distribution of these groups, and the dynamics of sectoral output, trade and financial linkages have evolved over time. Our results suggest that the Emerging South economies have increasingly become major players in the global economy because of their rapid economic growth fueled by the dramatic changes in their sectoral structure and international trade and financial linkages. As a result of these changes, the nature of interactions between the Emerging South and North has evolved from one of dependence to multifaceted interdependence.

We turn our attention to the dynamics of growth linkages across these groups in Section IV. The results indicate that there has been a noticeable pattern of convergence within each group of the North and Emerging South countries during the globalization period. In particular, growth fluctuations in aggregate output and production of industry and service sectors across the North countries have become more correlated. Similarly, the growth rates of output and industrial production of the Emerging South economies have become more strongly associated with those of their Emerging Southern trading partners. Surprisingly, cross-group correlations of growth fluctuations suggest that the Emerging South economic activity has

[3] The globalization period also coincides with a prolonged decline in the volatility of output in a number of countries in the North (see Kose, Otrok and Whiteman, 2007). In addition, the beginning of the globalization period marks the start of the Uruguay Round negotiations which substantially accelerated the process of unilateral trade liberalizations in many developing countries.

appeared to diverge (or decouple) from that of the North in the globalization period. While these are useful stylized facts about the transmission of fluctuations across these three groups, understanding the changing nature of growth spillovers requires a formal framework controlling numerous other factors. We tackle these issues in Section V.

In particular, Section V analyzes the evolving nature of growth spillovers across these three groups using a panel regression model that allows us to control for other growth determinants as well as common shocks. Our results suggest that the North economies have continued to play a dominant role in explaining the growth dynamics in the rest of the world during the globalization period. However, consistent with the stylized facts about the transmission of growth fluctuations documented above, the impact of the North on the growth dynamics of the Emerging South has declined in the globalization period relative to the earlier periods. Moreover, both the North and Emerging South economies have started to exhibit more intensive intra-group growth spillovers. This result is particularly pronounced in the case of the former group while there is only some suggestive evidence for the latter one. In contrast to the Emerging South economies, the Developing South countries have continued to be significantly affected by the growth dynamics in the North throughout the entire sample.

We also analyze how the North and Emerging South groups affect economic growth in the Asia and Pacific and the Latin America and the Caribbean regions in Section V. The results suggest that while the impact of the North on the former region has declined over time, it has not changed much on the latter one. Moreover, the Emerging South countries' effect on Asia and Pacific has appeared to be strengthening during the globalization period. These are intuitively appealing findings since countries in the Asia and Pacific region have played a particularly important role in the transformation of the Emerging South group. In section V, we also briefly discuss the implications of our results for the recent debate about global decoupling considering that this debate heavily focuses on the ability of the Asia and Pacific region to decouple from a potential slowdown in the United States. Section VI concludes with a summary of our findings and a discussion of their implications for the design of macroeconomic policies and theoretical models.

II. WHAT DO WE KNOW ABOUT THE NORTH-SOUTH LINKAGES?

There have been three streams of empirical research studying the implications of increasing trade and financial flows for the nature of cyclical and growth linkages between the developing countries of the North and the developing economies of the South. The first stream has merely focused on the changes in the time-series patterns of the interdependency across the North and South. The second stream of the literature has attempted to measure the magnitude of spillovers between the North and South. The third one has analyzed the determinants of the business cycle co-movement among countries and groups.

A. Characterizing the North-South Economic Linkages Over Time

Kose, Otrok, and Prasad (2007) examine the sources of macroeconomic fluctuations in the developed economies of the North and the developing countries of the South using dynamic

factor models and the series of output, consumption, and investment for the 1960–2005 period.[4] They explicitly separate the group of emerging markets from other developing economies in the South. They find that while the global factor accounts for a smaller share of business cycle variation in the globalization period, the factors capturing the common fluctuations in each group have become more important in the groups of developed and emerging market countries over time. In other words, intra-group business cycles have become more potent over time in these groups of countries.[5]

Hoffmaister, Pradhan, and Samiei (1998) analyze the long-run growth linkages between the North and South using annual data for the 1967–93 period by constructing group specific output aggregates. They show that despite the long term co-integrating relationship between the growth dynamics of the two groups, the influence of the North countries on the output growth of the South countries has declined over time. They also document a potential structural break in the North-South relationship around the late 1980s. In addition, they report that the South, especially Asia, has become more resilient to cyclical movements in the North possibly because of structural changes that have taken place among the emerging Asian economies over the last decades.

There are three papers focusing on the degree of business cycle co-movement across developed and developing countries using sectoral data. Kouparitsas (2001) documents various stylized facts about the linkages between cyclical growth fluctuations of the Northern and Southern sectoral activity for the 1970–95 period using annual growth rates. He documents strong contemporaneous correlations between the Northern industrial activity and the overall Southern economic activity. He interprets these results on the basis of the classical model of asymmetric trade between the industrialized North and the commodity exporting developing South. He concludes that the relationship between the North and South is unidirectional and terms of trade movements are equilibrium responses to the transmission of business cycles from the manufacturing sector in the North to the export sector of the South. In a related paper, using a dynamic general equilibrium model, Kouparitsas (1998) shows that productivity shocks in the North account for about 20 percent of the variation of aggregate output, roughly 70 percent of the variation of consumption, and 60 percent of the investment variation in the South.

Loayza, Lopez, and Ubide (2001) analyze the common economic patterns across countries in Latin America, East Asia, and Europe for the period of 1970–94 by means of an error components model. Their model decomposes annual real value added growth of GDP, industry, services and agriculture in each country into international, sectoral, and country specific effects. They find that growth fluctuations in the European and East Asian countries exhibit a significantly high degree of co-movement. For Latin America, however, they document that the country specific components to be more dominant owing to the fact that

[4] Their methodology closely follows the one in Kose, Otrok, and Whiteman (2003) who decompose the volatility in output, consumption, and investment into the world, region, country, and idiosyncratic components using a sixty-country sample over the 1960–90 period.

[5] Several other researchers find relatively stronger business cycle co-movement among developed economies using factor models (see Kose, Otrok, and Whiteman, 2007 and Canova, Ciccarelli, and Ortega, 2007) or simple correlations (see Kose, Prasad, and Terrones, 2003).

the Latin American countries have more heterogeneous economic structures and are relatively more closed to international trade and financial flows.

B. Quantifying the Extent of Linkages between the North and South

Some recent papers examine the role of trade partners' economic performance in driving the dynamics of growth. For example, Arora and Vamvakidis (2004) study the role of trade partners in driving the medium term economic growth using a fixed effects panel regression model for 101 countries for the period of 1960–1999. They find that the industrial countries of the North benefit from trading with the rapidly growing developing countries in the South while developing countries benefit from trading with the relatively high-income industrial economies in the North. Their results indicate that a one percentage point increase in the average growth of a country's trading partners increases domestic growth 0.8 percentage points over a 5-year period even after controlling for the global and group-wide trends.[6]

In a companion paper, Arora and Vamvakidis (2006) estimate the impact of the U.S. economy on the growth performance of a large sample of industrial and developing countries using a fixed-effects panel regression model for the period of 1980–98. Their results suggest that a one percentage point increase in the U.S. growth is associated with an average of one percentage point increase in the growth in other countries even when the non-U.S. world growth or growth in Japan and Europe is included in the regression.

Helbling and others (2007) examine the implications of a possible economic slowdown in the U.S. economy for other countries using a variety of empirical methods. They find that while the potential size of spillovers from the United States to other countries has increased with greater trade and financial integration, the importance of these links should not be overestimated. Spillovers are most important for countries with close trade and financial ties with the United States, particularly Latin America and some industrial countries, and they tend to be larger during recessions, when import growth turns sharply negative, than during mid-cycle slowdowns.

C. Determining the Underlying Forces of Business Cycle Co-movement

There is a complementary strand of literature examining the importance of various channels underlying the co-movement of business cycles. For example, Frankel and Rose (1998), Kose and Yi (2006) and Baxter and Kouparitsas (2005) find that trade integration plays an important role in driving business cycle co-movement. Imbs (2004 and 2006) emphasizes the importance of sectoral similarity in addition to trade flows. Darvas, Rose, and Szapáry (2005) and Clark and van Wincoop (2001) provide some support for the role of policy coordination

[6] Similarly, Calderon, Loayza, and Schmidt-Hebbel (2005) show the importance of the growth rate of trade partners in explaining domestic growth using a sample of 76 countries during 1970–2000. Ahmed and Loungani (2000) employ a vector-error correction model for the period of 1973–96 to estimate the impact of export weighted aggregate GDP of the largest trading partners on domestic output of several emerging market economies in Asia and Latin America. They report that the impact of foreign output shocks is roughly one-for-one after controlling for other shocks. Hsiao, Hsiao and Yamashita (2003) analyze the extent of interdependence between the United States and the Asia-Pacific region using VAR models.

in explaining business cycle co-movement. In a recent paper, Akin (2006) provides a detailed analysis of a number of channels in driving business cycle co-movement. Using the data of a large group of industrialized and developing economies, she shows that trade linkages, especially in the form of intra-industry trade, are the main determinants of cyclical co-movement. Her results also indicate that financial integration, the similarity of economic structures and the similarity of fiscal policies can lead to a higher degree of synchronization.

In addition, there are numerous studies analyzing the dynamics of business cycle co-movement in certain regions. Rana (2006 and 2007) argues that increased intra-industry trade flows and financial integration along with monetary policy coordination in East Asia have resulted in stronger cross-correlations of business cycles for some countries in the region. Shin and Wang (2004) also find that the relationship between trade and business cycle comovement in Asia is mainly driven by the extent of intra-industry trade flows. Kumakura (2006) emphasizes the importance of electronics industry in driving cross-country business cycle correlations in Asia.

III. Evolution of International Economic Linkages

This section starts with a detailed analysis of the size distribution of countries in the three groups and their growth dynamics. Next, it examines how international trade and financial linkages have evolved over time. It then provides a brief discussion of the implications of these changes for the traditional models of North-South growth linkages.

A. Changes in the Size of Distribution of Countries

The world economy has witnessed a dramatic shift in the size distribution of countries in the globalization period. To analyze these changes, we first divide the world (106 countries) into three groups of countries. The North is composed of 23 "core" OECD countries, the Emerging South includes 23 emerging markets, and the Developing South contains 60 developing countries. The group of Emerging South countries constitutes relatively more mature emerging markets in the sense that they attract the lion's share of international financial flows to developing countries.[7]

Table 1 shows that, during the period of 1960–85, the North economies on average constituted more than 70 percent of the world GDP (in PPP terms) while the share of the Emerging South was roughly 25 percent.[8] During the globalization period, the share of the Emerging South has increased to 34 percent while the Northern share has decreased to 62 percent. The share of the Developing South has registered a slight decline over time. These changes have mainly been the result of vibrant growth in the Emerging South in recent

[7] The countries in this group roughly correspond to those included in the MSCI Emerging Markets Index. The main differences are that we drop the transition economies because of limited data availability and add Hong Kong SAR, Singapore and Venezuela.

[8] Using PPP exchange rates is generally thought to provide a more balanced estimate of the relative importance of the rich and the poor countries since they adjust for the price distortions between traded and non-traded goods (see Callen, 2007). Developing countries constitute a much smaller share of the world economy when measured with weights in constant 2000 US dollars (see Helbling and others, 2007).

decades. Table 2 shows that the average growth in this group of countries has been more than two times faster than that in the North during the globalization period.[9]

The increase in the share of the Emerging South in the world GDP has been primarily driven by China and India. For example, China's share of world GDP has increased dramatically from 3.17 percent during the Bretton Woods period to 9.79 percent in the globalization period. Similarly, the share of India has risen from 4.36 percent to 5.61 percent over these periods.[10]

B. Changes in the Dynamics of Trade and Sectoral Output

Trade Openness

There have been significant changes in the volume and nature of trade flows during the globalization period. These changes have been fueled by the liberalization of trade policies around the world and rapid declines in the costs of transportation and communication. Figure 1 shows that the fraction of countries with a fully liberalized trade regime has precipitously increased in the globalization period.[11]

Figure 2 shows the evolution of trade openness, measured by the ratio of total trade to GDP, for the world and three groups. The measure of trade openness for the world has been relatively stable until 1985, but then has gained momentum during the globalization period. In particular, the ratio for the Emerging South has risen from 28 percent to 78 percent over this period. Similarly, for the North, the openness measure has increased from 26 percent to 46 percent during the globalization period. In contrast, the openness ratio for the Developing South has been rather stable over time. Relatively high level of trade openness of this group is the result of its heavy dependence on the exports of primary commodities and fuels.

Sectoral Changes

One particular reason for the dramatic increase in the degree of openness of the Emerging South is that many economies in this group have pursued aggressive industrialization policies based on export driven growth strategies over the last two decades (see Weiss, 2005). In the 1960–72 period, the average growth of exports of this group was lower than that of the North, but during the globalization period, it has been more than two times higher (Table 2).

These developments have been accompanied by a substantial reallocation of resources from agriculture to industry and services. Table 3 shows that the North has been rapidly increasing

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[9] Implications of increased trade and financial flows for economic growth in the Emerging and Developing South economies have been the subject of numerous papers (see Kose and others, 2006; and Winters, 2004).

[10] The rapid growth of Emerging South economies and their future growth potential have been a central theme in recent research. In particular, the growth potential of Brazil, Russia, India, and China (the BRIC economies) has been widely studied (see Coleman, 2007; Prasad, 2004; Tseng and Cowen, 2005; Aziz, Dunaway and Prasad, 2006; and Wilson and Purushothaman, 2003).

[11] Developing countries undertook the majority of unilateral trade liberalizations reported to the GATT following the beginning of the Uruguay Round negotiations in 1986 (see Qureshi, 1996).

the relative share of services sector while the Emerging South has been allocating more resources towards industry and services. These two sectors have been the driving forces of the growth in the Emerging South (Table 2). The Developing South, on the other hand, has continued to retain a relatively large agricultural sector during the globalization period.

Nature of Trade

There has also been a concurrent shift in the comparative advantage of the Emerging South from primary commodities to a diversified range of manufacturing products. Table 4 documents that during the Bretton Woods period, the groups of the Emerging South and Developing South have been similar in terms of the composition of their exports and imports. In particular, both groups have mainly been the exporters of primary commodities with the export share of 60 percent for the Emerging South and 81 percent for the Developing South while the manufacturing products have constituted the bulk of their imports. However, in the Emerging South, the share of commodities has declined to 17 percent while the share of manufacturing exports has rapidly increased to 74 percent of the total exports during the globalization period.

Table 4 also reveals that the share of manufacturing imports has expanded simultaneously with the growth of the manufacturing exports in the Emerging South. One of the underlying factors behind this trend has been the rising intra-industry trade between the North and Emerging South groups during the globalization period. Table 5 shows that the extent of intra-industry trade, measured by the average bilateral Grubel-Lloyd index, has been progressively increasing among the G-7 and between the Emerging South and G-7 countries since 1970.[12] The intra-industry trade intensity with the G-7 countries has been higher for the Emerging Asia in comparison to other Emerging South countries. The surge in intra-industry trade linkages between the North and Emerging South has been partly driven by the relocation of some Northern industrial facilities to the Emerging South. In particular, production processes among these two groups have been closely integrated and transformed into vertical trading chains with different countries specializing in different stages of production sequence (see Hummels, Ishii, and Yi, 2001).

Increased intra-industry trade with the North has also led to a significant change in the direction of trade flows around the world. As shown in Figure 3, the North has remained to be the dominant destination of global trade flows during the 1960–2005 period. The share of total world trade directed towards the Emerging South has significantly increased from 14 percent in 1985 to 25 percent in 2005. In testimony to the overall trade integration, the Emerging South has also become an important market for the North by increasing its share from 13 percent of the total Northern trade in 1985 to 21 percent in 2005. In contrast, the Developing South has continued to play a minor role in world trade during this period.

[12] Due to data limitations, the Grubel-Lloyd indices are available only bilaterally. In order to compute the intra-industry trade intensity, the index values of different countries in the Emerging South group are averaged. Similarly, the average index values of the G-7 countries are used as a proxy for the North.

South-South Trade Linkages

Figure 3 also shows that the intensity of intra- and cross-group trade linkages has increased in the South. For example, the share of intra-group trade in the total trade of the Emerging South trade has increased by fourfold from 9 percent in 1960 to 36 percent in 2005. During this period, the share of the Emerging Southern trade with the North has declined from 83 percent to 50 percent. Similarly, in the total trade of Developing South, the share of trade with the Emerging South has jumped from 6 percent in 1960 to 25 percent in 2005. China has been an engine of the growth of intraregional trade in Asia. For example, China related intra-regional trade flows grew by 12 times trade accounting for roughly 60 percent of intraregional trade within emerging Asia over the period 1990-2006 (see Hori, 2007). A significant fraction of intra-group trade flows in the Emerging South has been driven by intra-industry trade. Table 5 shows that intra-industry trade intensity of the Asian countries with the Emerging Asia has increased over time and it has in some cases exceeded the levels of Asian intra-industry trade with the G-7 in the 1990s**.** For example, within emerging Asia, China has been a major player in the growth of intra-industry trade as the index of intra-industry trade intensity between China and emerging Asia has increased from 0.06 to 0.32.

C. Changes in Financial Linkages

Financial Openness

The growth of international financial flows has overshadowed that of trade flows in the globalization period. This unprecedented change has been mainly associated with the rapid liberalization of capital account regimes since 1986. Figure 1 shows that the fraction of countries with liberalized financial systems has sharply increased in the globalization period. In addition, several "pull" and "push" factors have changed the composition of financial linkages between the North and South during the globalization period.[13] As a consequence, the composition of capital flows, in particular to the Emerging South, has rapidly changed, and portfolio-equity and foreign direct investment inflows have become more prominent.

Figure 4A displays the absolute level of integration of different country groups into global financial markets, calculated as the sum of gross international financial assets and liabilities. While the level of integration is clearly highest for the North economies, the Emerging South countries have accounted for the bulk of the integration experienced by the South. The gross stocks of assets and liabilities of the Emerging South has risen by more than fivefold and has been on average an order of magnitude larger than that of the Developing South during the globalization period.

[13] Most of these structural changes that can be classified as "pull factors" have taken place in the Emerging South economies. Privatization of state-owned enterprises, removal of restrictions on the acquisition of assets by foreigners, liberalization of domestic banking systems and stock markets, as well as gradual establishment of liberal capital account regimes have attracted the international capital flows towards the developing countries. As for the "push factors", demographic changes in the North countries have resulted in a search for higher returns (see Prasad and others, 2003 for details). For a detailed discussion of the evolution of foreign assets and liabilities around the world, see Lane and Milesi-Ferretti (2006).

Figure 4B presents the evolution of the composition of total foreign assets and liabilities for different groups of countries. Among the North economies, the biggest increase has been in the share of portfolio equity during the globalization period. The share of debt in gross stocks of foreign assets and liabilities of the Emerging South has declined from 80 percent to 50 percent during the same period while the share of FDI and portfolio equity has risen from a total of 13 percent to 40 percent. The share of portfolio equity has been rather small in the total stocks of the Developing South. Accumulation of official international reserves has recently accounted for a significant portion of the increase in gross foreign assets of the Emerging and Developing South economies (see Kose and others, 2006).

South-South Financial Linkages

Finally, there are also signs of increasing financial linkages between the Emerging South and Developing South groups commensurate with the rising importance of Emerging South in the global economy. For example, intra-South FDI flows increased by threefold over the period 1995–2003 (see World Bank, 2006; and Aykut and Goldstein, 2007). The share of flows from the Emerging South rose from 16 percent in 1995 to 36 percent in 2003 in the total FDI flows of the Developing South. These flows have mainly concentrated in the services and extractive industries backed by various government incentives for the Emerging Southern multinationals. The Emerging South banks have also started penetrating into the markets of the Developing South countries.

D. How to Characterize the North-South Linkages? Theory and Evidence

The dynamics of linkages between the North and South have been traditionally described as a form of "unidirectional dependence" with cyclical fluctuations and growth in the South being determined primarily by the developments in the North. According to the standard North-South model (see Findlay, 1980), the North wields greater economic influence on the South because of the Southern structural dependence on the Northern capital goods, finance, technology, and export markets. The asymmetric interaction between the two groups stems from the fact that the South is composed of poor developing countries specialized in the production and export of a narrow range of primary commodities while the North is composed of rich industrialized economies specialized in the production and export of manufacturing goods. In this traditional framework, the growth in the South is driven by the Northern demand for the Southern exports which are used as inputs in the Northern manufacturing sector. The growth spillovers across these groups are transmitted primarily through terms of trade fluctuations.[14]

[14] See Burgstaller and Saavedra-Rivano (1984) for an extension of the Findlay model with mobile capital flows. The model implies an inverse relationship between changes in the world capital stock and the South terms of trade. Beenstock (1988) shows that demand spillovers for the South exports through trade and a subsequent increase in the real commodity prices and terms of trade provide the main mechanism for the cyclical fluctuations and growth in the South economies. Chui and others (2002) provide a survey of the theoretical North-South models that combine the theory of trade with growth theory. For an excellent exposition of the insights from the earlier development literature analyzing the North-South linkages, see Lewis (1979).

However, the structural changes we have documented above suggest that the traditional framework of asymmetric North-South interaction might not be relevant anymore. In particular, the world economy has gone through several structural changes during the globalization period transforming the nature of interactions between the North and South from one of unidirectional dependence to multifaceted interdependence. For example, increasing economic weight of the Emerging South countries means that this group has started to play a more important role in explaining the dynamics of global economic growth.[15] Table 6 shows that, during the Bretton Woods period, the North and Emerging South groups accounted for 74 percent and 22 percent of the world GDP growth, respectively. In the globalization period, the average contribution of the Emerging South group to the global GDP growth has risen to 52 percent exceeding the Northern contribution of 45 percent.

In addition, the Emerging South group has begun to influence the dynamics of demand and supply in global commodity markets. For example, China, India and other rapidly growing Emerging South economies have become critical consumers of raw materials, food and energy and their demand has affected the dynamics of global commodity prices during the globalization period.[16]

The rapid diversification of the export base and industrial structure of the Emerging South towards the manufacturing activity has wide-ranging implications. For example, it indicates that the pattern of international division of labor described by the traditional framework has been changing. In particular, the Emerging South trade with the North has evolved from trade of raw materials to intra-industry trade where imported manufacturing goods from the Emerging South economies are used as intermediate products in the North. As a consequence of this, economic spillovers between the North and Emerging South have become more interdependent.[17] Moreover, there has been a concurrent increase in trade flows among the Emerging South countries leading to stronger intra-group spillovers (see Zebregs, 2004a).

The changes in the volume and composition of financial flows have also affected the nature of financial interactions between the North and Emerging South groups. The South experience with financial flows from the North in the traditional framework was characterized by the dominance of debt flows and official lending and the sensitivity of these flows to interest rates in the North economies before the globalization period (see Eichengreen and Mody, 1998; and Reinhart and Reinhart, 2001). With the rapid growth of portfolio-equity flows, fluctuations in financial markets in the North and Emerging South have become more interlinked as financial flows have become sensitive not just to the risk

[15] Zebregs (2004b) shows that trade flows in Asia have become more China-centric overtime as the Chinese market accounted for 17 percent of the Asian exports in 2002. Gaulier, Lemonie and Unal-Kesenci (2007) document the increase in the volume of vertical trade flows within Asia. For a detailed discussion of the changing nature of China's trade structure, see Cui and Syed (2007). IMF (2007) provides a brief discussion of the contribution of individual countries to global growth in recent years.

[16] For example, China absorbed more than 8 percent of total raw material exports of the Developing South group making it the third largest market after the EU with 34 percent and the United States with 23 percent in 2002 (see Yang, 2003).

[17] See Burstein, Kurz, and Tesar (2007) and Kose and Yi (2001, 2006) for models explaining the impact of vertical trade integration on the synchronization of business cycles.

and return conditions of the recipient economies but also to macroeconomic conditions in the North. In addition, cross-country international equity holdings have made asset prices in the Emerging South more responsive to financial conditions not only in the North but also in other Emerging South economies, as evidenced by the contagious nature of the 1997–98 Asian crisis.

In conclusion, the changes that have taken place in the globalization period imply that the venues of interaction between the North and Emerging South have become diversified and the relationship between these two groups has become more symmetric and interdependent in comparison to that between the North and Developing South groups. We now turn our focus to the implications of these changes for the growth linkages across these three groups of countries.

IV. Understanding Growth Linkages

We study the transmission of growth fluctuations in GDP and sectoral output within and across groups of countries using simple correlations in this section. We first describe the methodology used to construct the measures of aggregate economic activity of each group. Then, we document the stylized facts about the cross- and intra-group correlations of growth fluctuations.

A. How to Measure Aggregate Economic Activity?

We construct two group-wide measures for each macroeconomic variable of interest, including GDP and value added of industry, services, and agriculture sectors.[18] Our first measure is a widely used one based on the output-weighted sum of the growth rates of each variable. The second measure is a country-specific aggregate based on the trade-weighted sum of the growth rates of each variable. These two measures help us examine how the changes in the size distribution of countries and intensity of trade flows in each group affect the dynamics of group-wide economic activity.

Output-Weighted Index

To construct an output-weighted aggregate for each group, we first compute the time varying output weights, $yw_{i,t}^{R}$, for each country, *i,* by using the ratio of the respective country's GDP measured in PPP terms, $Y_{i,t}$, to the total GDP of its group. In particular, we compute the following ratio:

$$yw_{i,t}^{R} = \frac{Y_{i,t}}{\sum_{i=1}^{N^R} Y_{i,t}} \qquad (1)$$

[18] We use the annual growth rates of constant local currency values of GDP, industry, services and agriculture value added. Detailed information about the list of countries and data series is provided in Appendices V-VI.

where N^R denotes the number of countries in group R (North, Emerging South and Developing South).

We multiply the annual growth rate of each macroeconomic aggregate, $\Delta y_{i,t}^S$, with each country's lagged output weight and sum this multiplication over the sample of countries in each group to compute the output-weighted aggregate of each group, ΔYR_t^S

$$\Delta YR_t^S = \sum_{i=1}^{N^R} yw_{i,t-1}^R * \Delta y_{i,t}^S \qquad (2)$$

where S denotes the macroeconomic variable of interest (GDP or sectoral output).[19]

Trade-Weighted Index

Our second measure corresponds to country specific trade-weighted Northern and Emerging Southern indices for each country in our sample.[20] To construct the trade-weighted index for each country, we first compute the time varying bilateral trade weights for country i with country j in the North and Emerging South groups. In particular, we calculate the ratio of trade (exports and imports) of country i with country j to the total trade of country i with all the countries in the group that the country j belongs to. This ratio is denoted by $tw_{i,t}^{jR}$ and computed as follows:

$$tw_{i,t}^{jR} = \frac{X_{i,t}^j + M_{i,t}^j}{\sum_{j=1}^{N^R} X_{i,t}^j + M_{i,t}^j} \qquad (3)$$

where N^R denotes the number of countries in group R (North and Emerging South).

The trade-weighted index of country i, $\Delta TR_{i,t}^S$, is then derived by multiplying the annual growth rate of each macroeconomic aggregate of country j, $\Delta y_{j,t}^{SR}$, with the respective trade-weight of country i with country j and summing this multiplication over the sample of countries in the group the country j belongs to:

$$\Delta TR_{i,t}^S = \sum_{j=1}^{N^R} tw_{i,t}^{jR} * \Delta y_{j,t}^{SR} \qquad (4)$$

[19] When the annual growth rate of GDP or sectoral aggregate is multiplied with the lagged weight for each country, the nominator of the weight term and the denominator of the growth term will cancel out each other and the sum of the product over the sample will be equal to the aggregate growth of each group. Output weights are used both in the calculations of GDP and sectoral output indices.

[20] Since the quality of bilateral trade data for the Developing South countries is quite low, the trade weighted indices for this group are not constructed.

For example, in order to calculate the trade-weighted Emerging South index for China, trade volume of China with the Emerging South group is first calculated.[21] Next, the trade-weights for each trading partner of China in the Emerging South group are calculated by using the ratio of its trade with its respective trading partner to the total trade volume of China with the group. Then, these trade-weights are multiplied with the growth rates of macroeconomic aggregates of the respective trading partners. The trade-weighted index for China is the sum of these products over all the countries in the Emerging South group.

Why Two Distinct Indices? Similarities and Differences

The two indices of aggregate economic activity on average exhibit similar growth fluctuations. Figure 5A presents the Northern and Emerging Southern output- and trade-weighted indices of GDP. In the panel on the left, the averages of trade-weighted Northern GDP growth are calculated using all of the countries in our sample. The trade- and output-weighted Northern indices exhibit similar dynamics and capture several features of the global growth, including the trough associated with the oil shock in the mid-1970s, the recessions in the early 1980s and 1990s, and the recent global slowdown in 2001.

The panel on the right shows the consistent behavior across the trade- and output-weighted measures of GDP growth in the Emerging South. Both measures reflect the major events in this group of countries, such as the debt crisis in the mid-1980s and the 1997 Asian financial crisis. The trade-based index registers a sharper decline following the Asian crisis because of the relatively high trade intensity among the emerging Asian economies.

While the two indices on average display similar behavior, they serve different purposes in measuring economic activity of each group of countries. The output-based index generates a single, aggregated measure of economic activity driven by the size distribution of countries. This implies that large economies like the United States and China exert more influence on their respective group-wide indices. For example, since the United States on average constitutes about 38 percent of the total GDP of the North economies (in PPP terms) over the period 1960–2005, it has a significant impact on fluctuations in the output-weighted Northern index. The Chinese economy exerts a particularly large impact on the Emerging Southern index during the globalization period as the Chinese share in the total GDP of the Emerging South group has doubled from 14 percent during the pre-globalization period to 28 percent over the globalization period. During the 1960–2005 period, the correlation of the U.S. output growth with the output-weighted Northern index is 0.71 and the Chinese growth with the output-weighted Emerging Southern index is 0.59.

There are, however, some advantages in using the trade-based indices over the output-based ones. In particular, each country has a unique trade-weighted index where the weights for its growth fluctuations are proportional to its bilateral trade intensity with its trading partners in the same group. This provides a better characterization of the impact of group-wide economic activity for the respective country than the simple output-weighted index since the

[21] Since China belongs to the Emerging South group, the rest of Emerging South group is used to calculate the total trade of China with this group. The major trading hubs, including Hong Kong and Singapore, are excluded from the Emerging South group due to their disproportionately large shares of trade.

latter primarily captures the influence of large economies. As we discuss in Section II, trade linkages play a particularly prominent role in the transmission of economic fluctuations.[22]

In addition, since shocks to a particular economy often exert more influence on its neighboring trading partners, the trade-weighted index captures valuable information about the regional boom-bust episodes. Figure 5B presents the averages of the trade-weighted Emerging Southern GDP growth across different regions. The Emerging South index for Latin America displays sharper fluctuations during some important events for this region, such as the debt crisis in the early 1980s and the 2001 crisis in Argentina. Similarly, better growth performance of Asian economies during the 1980s and 1990s is reflected more clearly on the average growth of the Emerging Southern indices of the Asian economies as a result of deeper trade integration within Asia.

B. Stylized Facts about Growth Linkages

Cross-Group Correlations: Divergence Across Groups

We first examine the correlations across the growth rates of GDP and sectoral production based on the output- and trade-weighted indices for the North, Emerging South and Developing South groups. Table 7A presents the cross-group correlations based on the output-weighted indices. While the correlations between the Emerging Southern and Northern indices have increased during the common shock period relative to the Bretton Woods period, they have declined in the period of globalization.[23] In particular, the correlation between the Northern GDP and Emerging Southern GDP has decreased from 0.42 in the common shock period to 0.07 in the globalization period. Similarly, there has been a decrease from 0.63 to 0.22 in the correlation of group-wide indices of industrial output over these two periods. While the correlation between the Northern and Developing Southern GDP indices has been relatively more stable, the one between the Emerging and Developing Southern indices has decreased over time.[24] Our results suggest that the Emerging South has over time differentiated itself from the Developing South as growth fluctuations in the former group have diverged from the North in the globalization period.

There are of course other ways of studying cross-group correlations. Table 7B shows that the average correlations of GDP and sectoral growth of North countries with the output-weighted Emerging South indices produce similar results. The results from the average bilateral correlations of the Developing South countries with the trade-weighted and output-weighted Northern and Emerging Southern indices are not reported because they are close to zero. GDP and industrial output growth rates in the North countries have diverged from those of

[22] According to the trade-weighted index, for example, the African economies that trade heavily with France will have larger weights for France in the calculation of the North group-wide index in comparison to the Latin American economies that trade relatively less with France. Similarly, the Asian economies will have greater weights for the Japanese growth in their North indices because of their stronger trade linkages with Japan.

[23] We focus on the differences between the Bretton Woods and globalization periods since we would like to isolate the impact of common shocks from that of globalization on the evolution of international growth spillovers over time (see Kose, Otrok and Whiteman, 2007).

[24] We also compute the 10-year rolling window correlations of output and sectoral aggregates and find broadly consistent results with those reported in these tables.

their trading partners in the Emerging South group in the globalization period (Table 7C). The average of GDP (industrial output) correlations declined from 0.17 (0.31) in 1960–72 to -0.09 (-0.02) during the globalization period.

Intra-Group Correlations: Convergence Within Groups

We analyze the changes in the extent of intra-group growth linkages in Table 8 which presents the averages of bilateral correlations of GDP and sectoral growth rates of the North and Emerging South countries with their respective trade-weighted indices. The North countries on average have become more correlated with their Northern trading partners in the globalization period in comparison to the Bretton Woods period. For example, the average correlation between GDP growth of the Northern countries with that of their Northern trade partners has increased from 0.26 in 1960–72 to 0.53 in the globalization period. In a similar fashion, growth fluctuations in the Emerging South countries have become more correlated with their trading partners in the same group. The average intra-group correlation of GDP growth has steadily increased from 0.01 in 1960–72 to 0.35 in the globalization period.

With respect to the correlations of industrial output, the patterns are quite similar to those in GDP correlations. For example, industrial growth of the North countries is on average highly correlated with the growth rates of their Northern trading partners. The average correlation has increased from 0.48 in the 1960–72 period to 0.53 in the globalization period. Growth fluctuations in industrial output in the Emerging South countries have become more correlated with those in their trading partners in the same group as they have progressively increased from -0.09 in 1960–72 to 0.31 in the globalization period. Similar results are obtained in Table 9 using the average correlations across output-weighted Northern and Emerging Southern indices.

In sum, the extent of co-movement of growth fluctuations in the Emerging South with those in the North has become weaker over time. On the other hand, there has been an increase in the degree of co-movement of growth fluctuations across the North countries. In addition, growth fluctuations in the Emerging South economies have become more strongly associated with their trading partners in the same group.

These findings are consistent with some of the earlier results we surveyed in section II, but also provide some new insights. First, we argue that, rather than as a homogeneous entity, it is necessary to consider the South as the combination of two different groups of countries, the Emerging and Developing South, because of the dramatic changes documented in the previous section. Based on this new partition, we show that the growth dynamics of the Emerging South group have diverged from those of the North group. Second, we document that there has been a convergence in growth fluctuations within the North and Emerging South groups. Earlier studies have documented only one of these two results using standard macroeconomic aggregates, such as output, consumption and investment. Third, unlike the earlier studies, ours also examines to what extent the stylized facts associated with the GDP growth fluctuations are applicable to the dynamics of sectoral output using a comprehensive dataset.

V. QUANTIFYING GROWTH SPILLOVERS

While we provide a set of useful stylized facts about the growth linkages in the previous section, understanding the changes in the nature of growth spillovers within and across the three groups of countries requires a more formal framework controlling numerous other factors. In this section, we analyze these spillovers employing a regression model that accounts for such other factors, including several growth determinants. In particular, we use a set of panel OLS regressions with the following benchmark specification:

$$y_{i,t} = \alpha + \gamma' X_{i,t} + \beta N_{i,t} + \delta D_{pre-globalization} \times N_{i,t} + \varphi ES_{i,t} + \theta D_{pre-globalization} \times ES_{i,t} + \varepsilon_{i,t} \quad (5)$$

The dependent variable, $y_{i,t}$, is the 5-year average of the growth rate of the respective measure of economic activity, such as GDP, industry, services, and agriculture value-added of country *i*. Over the period 1960-2005, there are nine 5-year panels implying that each country has nine observations in these regressions.[25] The variables $N_{i,t}$ and $ES_{i,t}$ represent the 5-year averages of growth rates of each country's trade-weighted Northern and Emerging Southern indices, respectively. We prefer using the trade-weighted indices over the output-weighted ones in our regressions since they are unique to each country included in the estimation. Moreover, they account for the country specific levels of trade integration with the North and Emerging South economies.[26]

In this section, we simplify our earlier time demarcation by splitting the 1960–2005 period into two sub-periods: the globalization and pre-globalization periods. In order to identify the time variation associated with the Northern and Emerging Southern growth, we interact the group-wide indices of economic activity with a dummy variable, $D_{pre-globalization}$, representing the pre-globalization period (1960-1985) which combines the Bretton Woods period (1960-1972) and the common shock era (1973-1985).[27] In particular, the dummy variable takes the value of 1 before 1986 and is equal to 0 after. This implies that the β coefficient measures the average impact of the Northern growth during the globalization period while $(\beta + \delta)$ captures its average effect during the pre-globalization period. In other words, the δ coefficient indicates whether there is a change in the impact of the North growth over the two periods. Similarly, the φ coefficient corresponds to the average impact of the Emerging South growth in the globalization period and $(\varphi + \theta)$ measures its effect during the pre-globalization period.

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[25] The use of 5-year panels allows us to analyze the growth spillovers in the medium-term dampening the potential impact of transitory and volatile idiosyncratic shocks in shorter horizons. The panel regressions could also help explain some medium-term trends rather than year-to-year changes which are more apparent in the cross-correlations reported in the previous section. We tested the poolability of our specifications against the fixed or the random effects estimations but the existence of individual effects is rejected for the majority of the specifications.

[26] The results with the output-weighted indices are broadly consistent with the results using trade-weighted indices (see Appendix IIA). Results with 1991 as the starting year of the globalization period are also similar.

[27] As we discuss earlier, there are no significant changes in the nature of North-South trade and financial linkages in the pre-globalization period. In the previous section, we separate the common shock period to account for the impact of oil shocks in the 1970s and the contractionary monetary policies in the early 1980s. When we combine the two periods and compare the contemporaneous correlations of GDP and sectoral growth of the groups, we still observe the divergence of the cross-group activity in the globalization period.

$X_{i,t}$ represents a set of additional control variables widely used in the standard growth regressions (see Levine and Renelt, 1992). In particular, we use the log level of initial per capita GDP in PPP terms to measure the degree of convergence; the average population growth to account for the labor force growth; the share of investment in GDP as a proxy for fixed capital accumulation; the size of government spending relative to GDP; human capital endowment measured by the fraction of population over 15 years of age with secondary school attainment; and the log level of average inflation as a proxy for macroeconomic stability.

A. Results from the Benchmark Regressions

Output Growth Spillovers

We present the results of our benchmark GDP growth regressions in Table 10 for the world (whole sample) and the North, Emerging South and Developing South groups. The standard growth controls are significant with their expected signs in most cases.[28] The results indicate that the North economies play a major role in explaining GDP growth in the rest of the world. For example, a one percentage point increase in the growth of the North index is on average associated with approximately 0.6 percentage points increase in the GDP growth of the whole sample during the globalization period. On the other hand, a one percentage point increase in the growth of the Emerging South corresponds to roughly 0.2 percentage points growth spillover to the rest of the world during the globalization period. The pre-globalization coefficients associated with the Northern and Emerging Southern indices are not significant suggesting that the effects of these two groups on global growth have been stable over time.[29]

How do aggregate growth dynamics affect the average growth of countries in each group? The results suggest some interesting similarities with the stylized facts reported in the previous section. For example, the impact of Northern GDP growth on the North economies has increased over the two periods. A one percentage point increase in the Northern GDP growth corresponds to 0.75 percentage points increase in the average GDP growth of a typical North economy and this impact is about 0.54 percentage points higher than that in the pre-globalization period. This pattern is also observed in the growth dynamics of the Emerging South group as a one percentage point increase in the Emerging South growth tends to 0.35 percentage points increase in the GDP growth of the Emerging South economies during the globalization period. While this impact is larger than that in the pre-globalization period, the increase is not statistically significant.[30] In other words, consistent

[28] Investment is significant in all specifications; the convergence variable is significant for the North and Emerging South groups ; human capital development is significant for the GDP growth of the Emerging South group; population growth is significant for all the groups except the Emerging South; and inflation is significant for all the groups except the North.

[29] The results by Arora and Vamvakidis (2006) partially support our findings about the importance of the North GDP growth for the rest of the world. Their study looks at the growth spillovers from the United States during the period of 1980–98 for a large sample of developed and developing countries and finds that a one percentage point increase in the growth of the U.S. GDP generates a one percentage point increase in the growth of rest of the world.

[30] However, as we discuss later, this change is significant in the case of Asia Pacific countries.

with the findings about the convergence of growth correlations within groups, we find that the group-wide growth has become more important for countries in the same group over time.

In addition, there have been important changes in the cross-group growth spillovers over time consistent with our findings in the previous section. Specifically, the Northern impact on the Emerging South has decreased over time while its impact has been rather stable on the Developing South. For example, a one percentage point increase in the Northern GDP growth is associated with 0.34 percentage points increase in the GDP growth of the Emerging South economies during the globalization period but this is 0.41 percentage points lower than that in the pre-globalization period. In contrast, a one percentage point increase in the growth of the North activity corresponds to 0.45 percentage points rise in the Developing Southern GDP growth and this impact has been rather stable over time.

While these findings are consistent with some of the earlier results in the literature, they provide some new perspectives about the changing nature of linkages between the North and South. For example, the finding that the Northern activity has a larger and stable impact on growth in the Developing South confirms the results by Kouparitsas (2001). In his paper, a typical expansion in the North creates an expansion in the South as a result of the structural dependence of the South economies on the Northern export demand for primary commodities. Our results show that the asymmetric and unidirectional interaction modeled in the traditional North-South framework emphasized in Kouparitsas (2001) is applicable only in the context of North-Developing South growth spillovers. Moreover, our findings also suggest that the Emerging South economic activity has become less influenced by the Northern growth spillovers during the globalization period implying that the Emerging South has started differentiating itself from the Developing South in terms of its nature of growth linkages with the North.

Sectoral Growth Spillovers

The results associated with sectoral spillovers paint a broadly similar picture to that of output about the cross- and intra-group growth spillovers. To simplify the exposition, we present a summary of these findings in Figures 6 and 7.[31] For the whole sample (world), a one percentage point increase in the growth of industrial output in the North economies corresponds to approximately 0.6 percentage points rise in the average growth of the industrial value-added in the rest of the world. A one percentage point increase in the Emerging Southern industry growth is associated with an additional 0.16 percentage points expansion in the growth of industrial output in the rest of the world during the globalization period. There has been no significant temporal change in the extent of industrial growth spillovers from these two groups. Service output in the North appears to have a significant impact on the rest of the world as well.

[31] Detailed results of the regressions associated with the sectoral growth spillovers are presented in Appendix IIB.

With respect to the group-wide growth dynamics, the sectoral results are again similar to those of output. Specifically, there has been an increase in the extent of intra-group growth spillovers. For example, a one percentage point increase in the growth of industrial output in the North corresponds to slightly more than 0.6 percentage points increase in the growth of industrial output in the North economies. This impact is about 0.35 percentage points higher during the globalization period although the change over the two periods is not significant. A one percentage point increase in the industrial output of the Emerging South group is associated with 0.20 percentage points increase in the industrial output growth of the Emerging South economies, but this impact has not changed over time. Intra-group growth dynamics in the services sector exhibit a similar pattern with a statistically significant increase in the magnitude of growth spillovers from the Northern services to individual countries in the North across the two periods. However, there is no noticeable temporal pattern in the extent of growth spillovers in agricultural output.

The behavior of sectoral growth spillovers across groups is also consistent with that of GDP. A one percentage point increase in the growth of the Northern industrial output is associated with a growth of 0.40 percentage points in the Emerging South economies and this impact is two times higher in the pre-globalization period. Similarly, a one percentage point increase in the growth of the Northern services affects the Emerging South services growth by an additional 0.6 percentage points in the pre-globalization period in comparison to the insignificant impact during the globalization. On the other hand, the Developing Southern sectoral growth appears to be heavily affected by the Northern growth over both periods.

In summary, we have three major results in this section. First, intra-group growth spillovers have become stronger as countries in the North and Emerging South have become more interdependent. Second, there has been a decline in the cross-group growth spillovers as the impact of the North on the Emerging South has decreased over time. In other words, during the globalization period, the Emerging South countries have become more independent from the growth dynamics in the North in contrast to the Developing South countries. Third, the North still plays an important role in explaining the global economic growth.

B. Robustness Exercises

We conduct several exercises to check the robustness of our benchmark results. First, we control for various additional variables, including export structure, trade and financial openness, and common shocks. Then, we examine how the growth spillovers manifest themselves in specific regions such as Asia and Latin America. These exercises show that our main findings are quite robust.[32]

[32] In addition, we check the impact of outliers employing two methods. First, we run our robust regressions using the iteratively re-weighted least squares. Second, we apply an alternative methodology by excluding the observations that are two standard deviations above or below the mean growth rate of the samples. Both methods lead to broadly similar coefficient estimates with those of the benchmark regressions. The results of these regressions are available from the authors upon request.

Controlling for Export Structure, Openness, and Common Shocks

We extend our benchmark model by including the following variables: the share of manufacturing exports as a proxy for the high value-added component of the export structure; the extent of trade openness, measured by the fraction of years the country has an open trading regime using Sachs and Warner (1995) de-jure trade liberalization dummy; the degree of financial openness, measured by the share of the stock of FDI and portfolio-equity liabilities in GDP; and common shocks proxied by the changes in oil prices. Appendix III presents the details of these regression results. The results show that inclusion of these variables does not affect our qualitative findings, but they lead to some minor changes in the magnitudes of some coefficients of interest. [33]

Consistent with our benchmark results, the impact of the Northern GDP and sectoral growth on the average growth of the North economies has increased in the globalization period while the Emerging South has become less dependent on the growth spillovers from the Northern activity in the globalization period. The sectoral results point to the same conclusions. Finally, the impact of the Emerging Southern GDP and sectoral growth on the growth of countries in this group is significant during the globalization period and the estimates are broadly consistent with the benchmark results.

Growth Spillovers Across Geographical Regions

We also examine how the growth dynamics in the North and Emerging South groups affect economic growth in countries in the Asia and Pacific (AP) and the Latin America and the Caribbean (LAC) regions.[34] Appendix IV provides a summary of the regression coefficients of the Northern and Emerging Southern GDP and sectoral growth. The impact of the North GDP, industry and services growth on the respective aggregates of the AP region has clearly declined during the globalization period whereas the Emerging Southern trading partners' effect has been significant and strengthened over time. In particular, while the impact of the Northern GDP (industrial output) growth on the AP region is significant during the pre-globalization period, it has become insignificant over the period of globalization. On the other hand, a one percentage point increase in the Emerging Southern GDP growth is associated with 0.35 points increase on the growth of the AP region during the globalization period and this impact is 0.27 points higher relative to the pre-globalization period.

In contrast, the impact of Northern GDP and sectoral growth on the LAC region is significant during the globalization period but there is no clear indication that the extent of spillovers has

[33] Manufacturing exports have a significant impact on GDP and sectoral growth of the whole sample and the Emerging South GDP. We find that trade openness has a positive impact on the GDP, industry and services growth of the Developing South group, and the GDP and services growth of the North group. Financial openness has a positive impact on the North. In contrast, the impact on the Emerging South is either statistically insignificant for the growth rates of GDP and services or negative for the industry growth. Finally, oil price changes positively affect the Developing South growth.

[34] Note that these two regions include countries from both the Emerging and Developing South groups.

strengthened over time. The Emerging Southern industrial output growth has a significant growth impact on the LAC industrial production during the globalization period.

What are the implications of these findings for the recent debate about decoupling? This debate focuses on the ability of emerging market economies, especially emerging countries in the AP region, to decouple from a potential slowdown in the United States (see Helbling and others, 2007).[35] Our findings indicate that the impact of the North on the Emerging South countries has been declining over the past two decades implying that there is some partial support for the decoupling of business cycles of this group from the advanced countries in the North. As our robustness exercises show, these results are also valid for the AP region.

However, the relevance of our findings for the decoupling debate should not be overstated. First, our results apply to a large group of advanced countries in the North, not just the United States. Second, they are suggestive of some changes in the evolution of annual growth fluctuations in the three groups of countries and how these groups affect each other. While the results are robust to the inclusion of several factors in the panel regressions, these regressions do not account for potential non-linearities and general equilibrium considerations which are particularly important in an analysis of the merits of the decoupling view.

As Helbling and others (2007) discuss adverse developments in the U.S. economy can have a significant impact on emerging markets in the presence of certain non-linearities involving the amplitude of business cycles. To analyze the importance of such non-linearities, they undertake a detailed event study of the implications of U.S. recessions and slowdowns for the rest of the world. They find that spillovers are larger during full blown U.S. recessions than during mid-cycle slowdowns. Moreover, in light of the large volume of global trade and financial flows, they consider the general equilibrium implications of these episodes. They conclude that the U.S. recessions are more worrisome for the rest of the world since U.S. import growth turns sharply negative during recessions, and cross-country asset price correlations increase significantly during financial market downturns.

VI. CONCLUSION

This paper examines the changing nature of growth spillovers between the developed economies of the North and the developing countries of the South. We begin with a detailed account of structural changes in these groups that have taken place over the past two decades. Our findings suggest that the South is no longer a homogenous group of developing countries. In particular, the Emerging South countries have diversified their economies, attained high growth rates and increasingly become important players in the global economy. As a result, the nature of economic interactions between the North and Emerging South has evolved from one of dependence to multidimensional interdependence.

[35] For additional information about the decoupling debate in the context of Asia, see He, Cheung and Chang (2007) and Asian Development Bank (2007).

We then document a set of basic stylized facts about the evolution of intra- and cross-group correlations of growth fluctuations. The results indicate that cross-country correlations of growth fluctuations in aggregate output within each group of the North and Emerging South countries have increased over time implying that there has been a noticeable pattern of intra-group convergence of growth spillovers. Surprisingly, while cross-group correlations of growth fluctuations suggest that the Emerging South economic activity has appeared to decouple from that of the North over time, there has been no significant change in the nature of growth linkages between the North and Developing South. The dynamics of sectoral production, especially those of industrial production and services, also exhibit similar stylized facts.

Next, we study the extent of growth spillovers from the North and Emerging South groups to GDP and sectoral output of individual countries. In particular, we employ a panel regression model to analyze the quantitative importance of group-wide indices of GDP and sectoral output in explaining domestic economic activity after controlling for various factors, including the standard growth determinants, export structure, trade and financial openness, and oil price changes. Consistent with the stylized facts summarized above, we find that the impact of the North on the growth dynamics of the Emerging South has declined in the globalization period (1986–2005) relative to the earlier periods. Moreover, both the North and Emerging South economies have started to exhibit more intensive intra-group growth spillovers. In contrast to the Emerging South, the Developing South countries have continued to be significantly affected by the Northern growth throughout the entire sample.

We also study how the Asia and Pacific and the Latin America and the Caribbean regions are affected by the growth dynamics in the North and Emerging South groups. Our findings indicate that while the impact of the North on the former region has declined over time, it has not changed much on the latter one. In addition, the impact of the Emerging South on Asia and Pacific appears to have increased during the globalization period. These findings confirm that the rapid growth in the Asia and Pacific region, which was partly driven by the integration of China and India into the global economy, has played a major role in the transformation of the Emerging South group.

Our findings have important implications for the design of economic policies and theoretical models. The changing nature of international linkages implies that the global macroeconomic environment can have significant effects on domestic conditions that should be taken into account in the formulation of policies (see Reisen, Grandes, and Pinaud, 2005; and Lenain and de Serres, 2002). Furthermore, nationally oriented policies aimed at economic stabilization would have a limited impact if growth dynamics in small open economies are driven primarily by external factors such as trade partner's growth and capital flows. Under these circumstances, economic policies need to focus on domestic macroeconomic fundamentals, efficient functioning of markets and of institutions to mitigate the potentially adverse effects of external shocks.

Moreover, in a highly integrated world economy with more potent channels of transmission, the desirability and effectiveness of international policy coordination have become increasingly more relevant. For example, according to the traditional models based on trade multiplier mechanisms, our findings would suggest a growing need for international policy

coordination (Oudiz and Sachs, 1984). In these models, international policy coordination can result in sizeable welfare gains if the degree of integration of goods and assets markets is high. If international economic linkages are strong, countries can implement policies targeting current account dynamics to stimulate their economies and such policies can have a strong effect on domestic and global economic activity.

Recent research by Obstfeld and Rogoff (2001), on the other hand, provides insights quite different than those in the earlier literature. In particular, they argue that increased integration may in fact diminish the need for monetary policy coordination since international financial markets generate an expanded set of opportunities for cross-country risk sharing. Policymakers should then focus on eliminating the distortions created by various rigidities in domestic markets. They also find that the coordination of national economic policies serves little purpose in response to global shocks since it is not possible for countries to insure each other against such shocks.[36]

With respect to theory, it is a major challenge for the traditional North-South models to explain some of the stylized facts documented here. For example, the classical North-South model assumes that the growth dynamics in the South are primarily driven by the North. This model considers the South as a homogenous group of poor developing countries specialized in the production and export of a narrow range of primary commodities while the North is composed of industrialized economies specialized in the production and export of manufactured goods. Consequently, the relationship between the two groups is an asymmetric one.[37] The structural changes we document here suggest that the assumption of the asymmetric North-South interaction might not be relevant anymore. Recent modeling efforts attempt to account for some of the observations we document here, but they fall short of explaining various features associated with the evolving nature of North-South linkages.[38]

[36] For recent surveys on international policy coordination, see Meyer and others (2004) and Canzoneri, Cumby, and Diba (2005).

[37] In his Nobel Prize lecture, Lewis (1979) notes that *"…For the past hundred years the rate of growth of output in the developing world has depended on the rate of growth of output in the developed world. When the developed world grow fast the developing world grow fast, when the developed slow down, the developing slow down. Is this linkage inevitable?..."* The results reported in this paper suggest that the nature of linkages between the developed world and the developing world has been changing, and, at least for the group of Emerging South countries of the developing world, the linkage Lewis identified appears to be evitable.

[38] For an early discussion of these issues, see Currie and Vines (1988). Chui and others (2002) provide a survey of theoretical North-South models focusing on trade and growth. For some recent modeling efforts analyzing the implications of the changing nature of international trade linkages for the growth of world trade and transmission of business cycles, see Kehoe and Ruhl (2003), Yi (2003), Kose and Yi (2006), and Burstein, Kurz, and Tesar (2007).

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Table 1. Size Distribution of Groups
(in percent)

	1960-1972	1973-1985	1986-2005
North	73.40	70.25	62.38
Emerging South	22.03	25.41	33.74
Developing South	4.57	4.34	3.88

Notes: The values correspond to the period averages of shares that are calculated for each year based on GDP with constant PPP 2000 International dollars.

Table 2. Average Growth Rates of Macroeconomic and Sectoral Aggregates
(in percent)

	1960-1972	1973-1985	1986-2005
North			
GDP	4.89	2.82	2.63
Agriculture	1.26	2.04	1.37
Industry	5.41	1.65	1.97
Services	4.67	3.21	2.91
Exports	7.95	5.47	5.69
Emerging South			
GDP	5.15	5.00	5.63
Agriculture	3.19	3.40	2.57
Industry	6.47	5.54	6.36
Services	4.96	5.94	5.84
Exports	5.17	7.76	11.73
Developing South			
GDP	4.11	3.14	3.24
Agriculture	1.94	2.29	3.15
Industry	6.89	3.81	3.34
Services	2.46	4.49	3.30
Exports	4.67	4.80	6.12

Notes: The values correspond to the period averages of growth for each group calculated using the sum of PPP-based output weighted constant local currency growth rates of GDP, exports and sectoral value added of each country in the corresponding group.

Table 3. Changes in the Sectoral Composition
(in percent)

	1960-1972	1973-1985	1986-2005
World			
Agriculture	5.67	4.41	3.91
Industry	32.98	31.86	29.59
Services	61.39	63.73	66.51
North			
Agriculture	3.50	2.43	1.92
Industry	33.60	32.11	28.69
Services	62.90	65.46	69.39
Emerging South			
Agriculture	21.59	15.72	12.28
Industry	27.93	29.74	33.38
Services	50.48	54.54	54.34
Developing South			
Agriculture	28.96	20.97	20.09
Industry	29.91	33.90	32.13
Services	44.61	45.13	47.91

Notes: The values correspond to the period averages of sectoral value added as a share of total value added computed using the constant 2000 U.S. dollars sectoral value added series.

Table 4. Changes in the Composition of Trade
(in percent)

Exports	1960-1972	1973-1985	1986-2005
North			
Primary Non-fuels	24.92	19.48	14.18
Primary Fuels	3.79	6.37	4.20
Manufacturing	71.37	74.22	81.63
Emerging South			
Primary Non-fuels	60.80	37.76	17.05
Primary Fuels	16.78	23.65	9.00
Manufacturing	23.33	38.59	73.95
Developing South			
Primary Non-fuels	81.53	35.64	33.36
Primary Fuels	14.96	56.80	40.77
Manufacturing	7.33	9.43	28.21

Imports	1960-1972	1973-1985	1986-2005
North			
Primary Non-fuels	35.74	22.21	15.39
Primary Fuels	11.59	22.69	9.51
Manufacturing	52.66	55.11	75.10
Emerging South			
Primary Non-fuels	26.60	19.71	13.94
Primary Fuels	7.38	17.00	9.45
Manufacturing	66.02	63.29	76.61
Developing South			
Primary Non-fuels	20.98	19.61	20.60
Primary Fuels	7.85	13.31	9.75
Manufacturing	71.17	67.12	69.65

Notes: The values correspond to the period averages of sectoral shares of merchandise exports and imports data. Primary non-fuels are defined as the sum of agricultural raw materials, food, ores, and metals.

Table 5A. Intra-Industry Trade Intensity (Grubel-Lloyd Index)

G-7		G-7	Emerging Latin America	Emerging Asia	Other Emerging South
	1970-79	0.285	0.120	0.076	0.078
Canada	1980-89	0.307	0.108	0.096	0.120
	1990-99	0.383	0.138	0.140	0.175
	1970-79	0.535	0.078	0.123	0.118
France	1980-89	0.540	0.101	0.144	0.188
	1990-99	0.608	0.156	0.269	0.275
	1970-79	0.514	0.089	0.114	0.125
Germany	1980-89	0.507	0.122	0.166	0.159
	1990-99	0.594	0.154	0.285	0.230
	1970-79	0.418	0.086	0.101	0.152
Italy	1980-89	0.441	0.106	0.125	0.208
	1990-99	0.482	0.156	0.267	0.269
	1970-79	0.312	0.056	0.123	0.064
Japan	1980-89	0.290	0.083	0.157	0.071
	1990-99	0.362	0.063	0.309	0.084
	1970-79	0.536	0.095	0.142	0.173
United Kingdom	1980-89	0.537	0.104	0.184	0.224
	1990-99	0.631	0.172	0.300	0.331
	1970-79	0.484	0.193	0.196	0.115
USA	1980-89	0.502	0.241	0.289	0.172
	1990-99	0.602	0.318	0.386	0.262

Emerging Latin America		G-7	Emerging Latin America	Emerging Asia	Other Emerging South
Argentina	1970-79	0.118	0.267	0.054	0.018
	1980-89	0.129	0.204	0.034	0.026
	1990-99	0.138	0.301	0.073	0.061
Brazil	1970-79	0.172	0.160	0.023	0.008
	1980-89	0.217	0.182	0.036	0.039
	1990-99	0.275	0.255	0.099	0.118
Chile	1970-79	0.064	0.116	0.019	0.000
	1980-89	0.071	0.115	0.042	0.013
	1990-99	0.094	0.215	0.035	0.069
Colombia	1970-79	0.061	0.144	0.020	0.006
	1980-89	0.071	0.140	0.041	0.003
	1990-99	0.118	0.248	0.054	0.047
Mexico	1970-79	0.213	0.234	0.020	0.000
	1980-89	0.251	0.200	0.045	0.029
	1990-99	0.332	0.260	0.163	0.104
Peru	1970-79	0.059	0.107	0.053	0.002
	1980-89	0.062	0.136	0.035	0.004
	1990-99	0.073	0.175	0.030	0.017
Venezuela	1970-79	0.031	0.139	0.000	0.000
	1980-89	0.065	0.146	0.012	0.026
	1990-99	0.127	0.208	0.044	0.033

Notes: The values correspond to the period averages of intra-industry trade intensity of each country with respective groups. Intra-industry trade intensity of a specific country vis-à-vis the groups is measured by the average of the bilateral Grubel-Lloyd Indices of that country with the other countries included in the group.

Table 5B. Intra-Industry Trade Intensity (Grubel-Lloyd Index)

Emerging Asia		G-7	Emerging Latin America	Emerging Asia	Other Emerging South
China	1970-79	0.099	0.083	0.055	0.000
	1980-89	0.141	0.044	0.131	0.039
	1990-99	0.268	0.067	0.317	0.107
India	1970-79	0.125	0.024	0.089	0.154
	1980-89	0.101	0.018	0.099	0.068
	1990-99	0.201	0.098	0.254	0.239
Indonesia	1970-79	0.065	0.001	0.059	0.003
	1980-89	0.069	0.010	0.134	0.017
	1990-99	0.163	0.064	0.300	0.069
Korea	1970-79	0.192	0.058	0.090	0.064
	1980-89	0.231	0.078	0.173	0.078
	1990-99	0.354	0.066	0.319	0.113
Malaysia	1970-79	0.204	0.006	0.166	0.067
	1980-89	0.250	0.053	0.226	0.005
	1990-99	0.353	0.064	0.395	0.052
Phillipines	1970-79	0.106	0.007	0.114	0.002
	1980-89	0.224	0.028	0.201	0.016
	1990-99	0.324	0.055	0.294	0.065
Thailand	1970-79	0.084	0.048	0.124	0.024
	1980-89	0.143	0.014	0.151	0.067
	1990-99	0.292	0.085	0.343	0.178

Other Emerging South		G-7	Emerging Latin America	Emerging Asia	Other Emerging South
Egypt	1970-79	0.071	0.002	0.086	0.002
	1980-89	0.072	0.006	0.061	0.031
	1990-99	0.114	0.025	0.048	0.137
Israel	1970-79	0.244	0.016	0.156	0.000
	1980-89	0.324	0.023	0.068	0.068
	1990-99	0.379	0.051	0.241	0.233
Morocco	1970-79	0.084	0.002	0.003	0.005
	1980-89	0.134	0.007	0.004	0.011
	1990-99	0.197	0.025	0.047	0.085
Turkey	1970-79	0.047	0.000	0.016	0.005
	1980-89	0.114	0.022	0.055	0.048
	1990-99	0.209	0.082	0.132	0.172
South Africa	1970-79	0.142	0.011	0.013	0.000
	1980-89	0.171	0.040	0.027	0.036
	1990-99	0.263	0.129	0.120	0.160

Notes: See notes in Table 5A.

Table 6. Contribution to World GDP Growth
(in percent)

	1960-1972	1973-1985	1986-2005
North	74.00	48.86	44.62
Emerging South	22.34	46.36	51.84
Developing South	3.66	4.77	3.53

Notes: The values correspond to the period averages of the growth contributions of each group to the world growth. The sum of PPP-based output weighted constant local currency growth rates are used to construct the world growth. Growth contribution of each group is measured as the ratio of the sum of the weighted growth of countries included in each group to the world growth.

Table 7A. Cross-Group Correlations
(Output Weighted Indices)

	1960-1972	1973-1985	1986-2005
North-Emerging South			
GDP	0.23	0.42	0.07
Agriculture	0.06	0.46	-0.05
Industry	0.34	0.63	0.22
Services	-0.37	0.54	-0.19
North-Developing South			
GDP	0.32	0.27	0.20
Agriculture	0.28	-0.02	0.12
Industry	0.47	0.80	0.50
Services	-0.30	-0.16	0.03
Emerging South-Developing South			
GDP	0.75	0.31	0.18
Agriculture	0.01	0.23	0.31
Industry	0.72	0.63	0.04
Services	0.28	0.28	0.04

Notes: The values correspond to the correlations between the PPP-based output weighted GDP and sectoral indices of the North, Emerging South, and the Developing South groups.

Table 7B. Correlations between North and Emerging South
(Correlations with Output Weighted Emerging South Index)

	1960-1972	1973-1985	1986-2005
GDP	0.12	0.34	-0.07
Agriculture	0.15	0.07	0.04
Industry	0.25	0.42	0.01
Services	-0.05	0.36	-0.14

Notes: The values correspond to the cross-country averages of bilateral correlations of GDP and sectoral growth rates of North countries with the output weighted Emerging South indices for each period.

Table 7C. Correlations between North and Emerging South
(Correlations with Trade Weighted Emerging South Indices)

	1960-1972	1973-1985	1986-2005
GDP	0.17	0.41	-0.09
Agriculture	0.26	0.10	-0.03
Industry	0.31	0.44	-0.02
Services	0.05	0.38	-0.17

Notes: The values correspond to the cross-country averages of bilateral correlations of GDP and sectoral growth rates of North countries with the trade weighted Emerging South indices for each period.

Table 8. Intra-Group Correlations
(Trade Weighted Indices)

North	1960-1972	1973-1985	1986-2005
GDP	0.26	0.58	0.53
Agriculture	0.08	0.29	0.12
Industry	0.48	0.59	0.53
Services	0.24	0.52	0.41
Emerging South			
GDP	0.01	0.27	0.35
Agriculture	0.002	0.02	0.13
Industry	-0.09	0.28	0.31
Services	-0.13	0.06	0.17

Notes: The values correspond to the cross-country averages of bilateral correlations of GDP and sectoral growth rates of countries in the North and Emerging South groups with the respective trade weighted group indices for each period.

Table 9. Intra-Group Correlations
(Output Weighted Indices)

North	1960-1972	1973-1985	1986-2005
GDP	0.24	0.53	0.50
Agriculture	0.24	0.22	0.09
Industry	0.43	0.56	0.45
Services	0.28	0.49	0.45
Emerging South			
GDP	0.10	0.22	0.39
Agriculture	0.07	0.06	0.19
Industry	0.15	0.29	0.36
Services	0.11	0.17	0.25

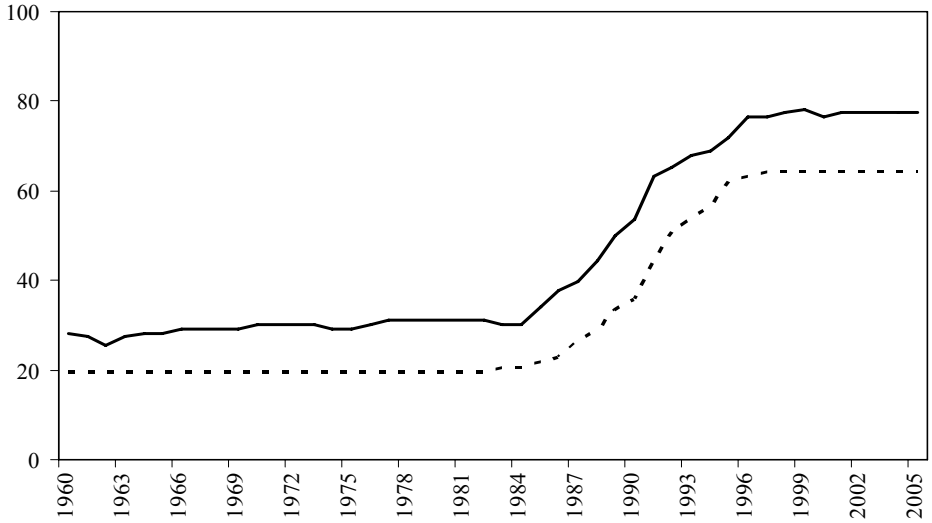
Notes: The values correspond to the cross-country averages of bilateral correlations of GDP and sectoral growth rates of countries in the North and Emerging South groups with the respective output weighted group indices for each period.

Table 10. Benchmark GDP Growth Regressions

	GDP			
Variable	Whole Sample (1)	North (2)	Emerging South (3)	Developing South (4)
Northern GDP	0.589***	0.744***	0.344*	0.448***
	[0.1]	[0.19]	[0.18]	[0.16]
Northern GDP * D pre-globalization	0.00448	-0.537**	0.412**	-0.0845
	[0.13]	[0.25]	[0.18]	[0.18]
Emerging South GDP	0.173**	-0.158	0.355***	0.0788
	[0.074]	[0.099]	[0.12]	[0.094]
Emerging South GDP * D pre-globalization	0.0495	0.195	-0.122	0.107
	[0.079]	[0.12]	[0.093]	[0.12]
log (Initial Percapita GDP)	-0.0495	-2.288***	-1.100**	0.182
	[0.21]	[0.59]	[0.43]	[0.22]
Population Growth	0.614***	1.020***	0.0635	0.700***
	[0.15]	[0.23]	[0.21]	[0.2]
Investment / GDP	0.0818***	0.0753**	0.160***	0.0622***
	[0.019]	[0.035]	[0.029]	[0.014]
Government Spending / GDP	-0.0036	-0.0192	0.00794	-0.0196
	[0.016]	[0.023]	[0.021]	[0.034]
log (100 + Inflation)	-1.736***	-3.72	-1.299***	-2.204***
	[0.32]	[4.37]	[0.38]	[0.39]
Secondary Education (15+)	0.018	0.000156	0.0567**	0.0169
	[0.015]	[0.011]	[0.027]	[0.018]
Constant	6.370**	40.06*	11.94**	7.866***
	[2.59]	[22.9]	[4.77]	[2.57]
Observations	803	198	192	413
R-squared	0.25	0.56	0.43	0.21

Notes: The dependent variable is the 5-year average of annual real GDP growth. The North and Emerging South GDP refer to the 5-year averages of the country specific trade-weighted GDP growth indices of the respective groups. Detailed descriptions of other explanatory variables are available in Appendix VII. Heteroscedasticity consistent robust standard errors from the pooled OLS regression are reported in parenthesis. The symbols *, ** and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.

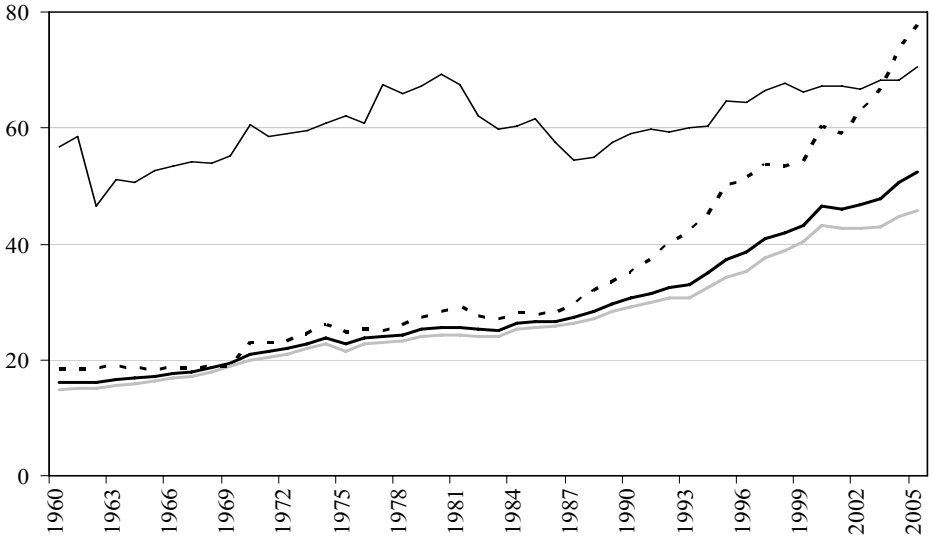
Figure 1. Evolution of Trade and Financial Liberalization
(fraction of liberalized countries, in percent)



Solid line = Trade Liberalization; Dashed line = Financial Liberalization

Notes: Trade liberalization measure indicates the fraction of countries with a fully liberalized trade regime. The dates of trade liberalization are determined on the basis of the Sachs and Warner (1995) and Wacziarg and Welch (2003). Financial liberalization measure indicates the fraction of countries with a liberalized financial system. The dates of official liberalization are determined on the basis of stock market liberalization and removal of restrictions on foreign investment based on the Bekaert, Harvey, and Lundblad (2005).

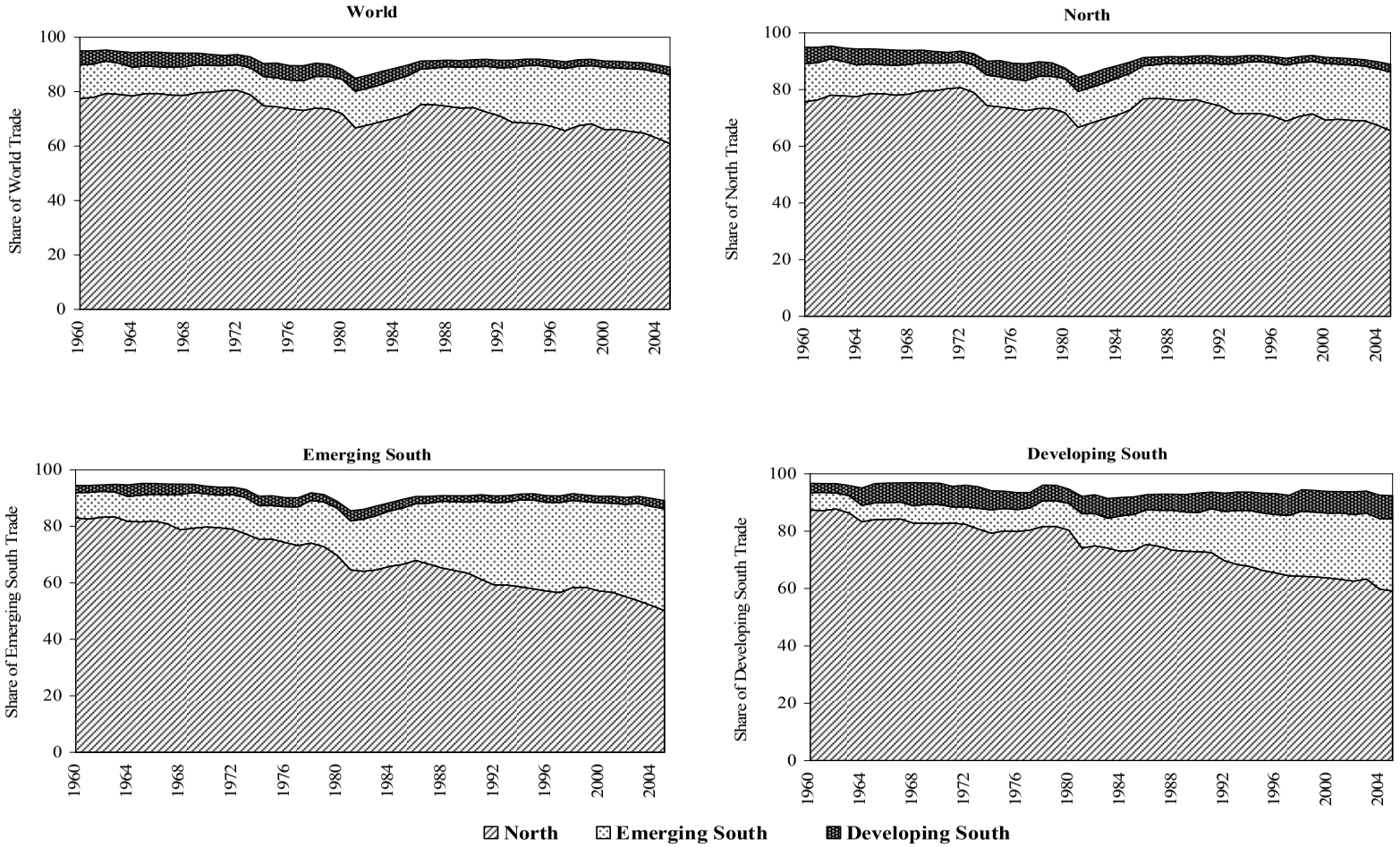
Figure 2. Trade Openness
(Exports+Imports/GDP, in percent)



Thick line = World; Gray line: North; Dashed line = Emerging South; Thin Line= Developing South

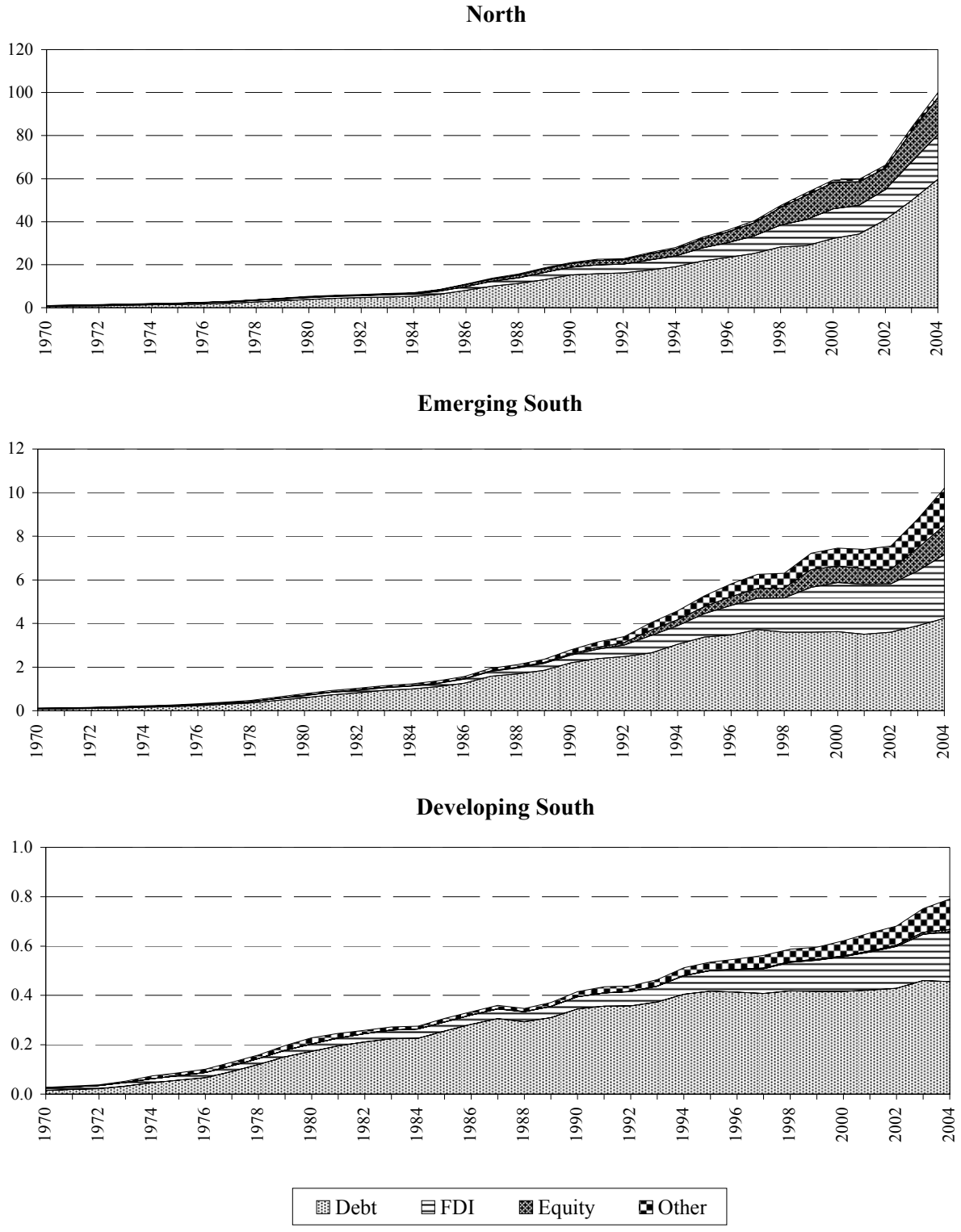
Notes: This figure shows the ratio of constant 2000 U.S. dollar values of the sum of exports and imports of goods and services over combined GDP of the world and each group.

Figure 3. Direction of Trade Flows
(in percent)



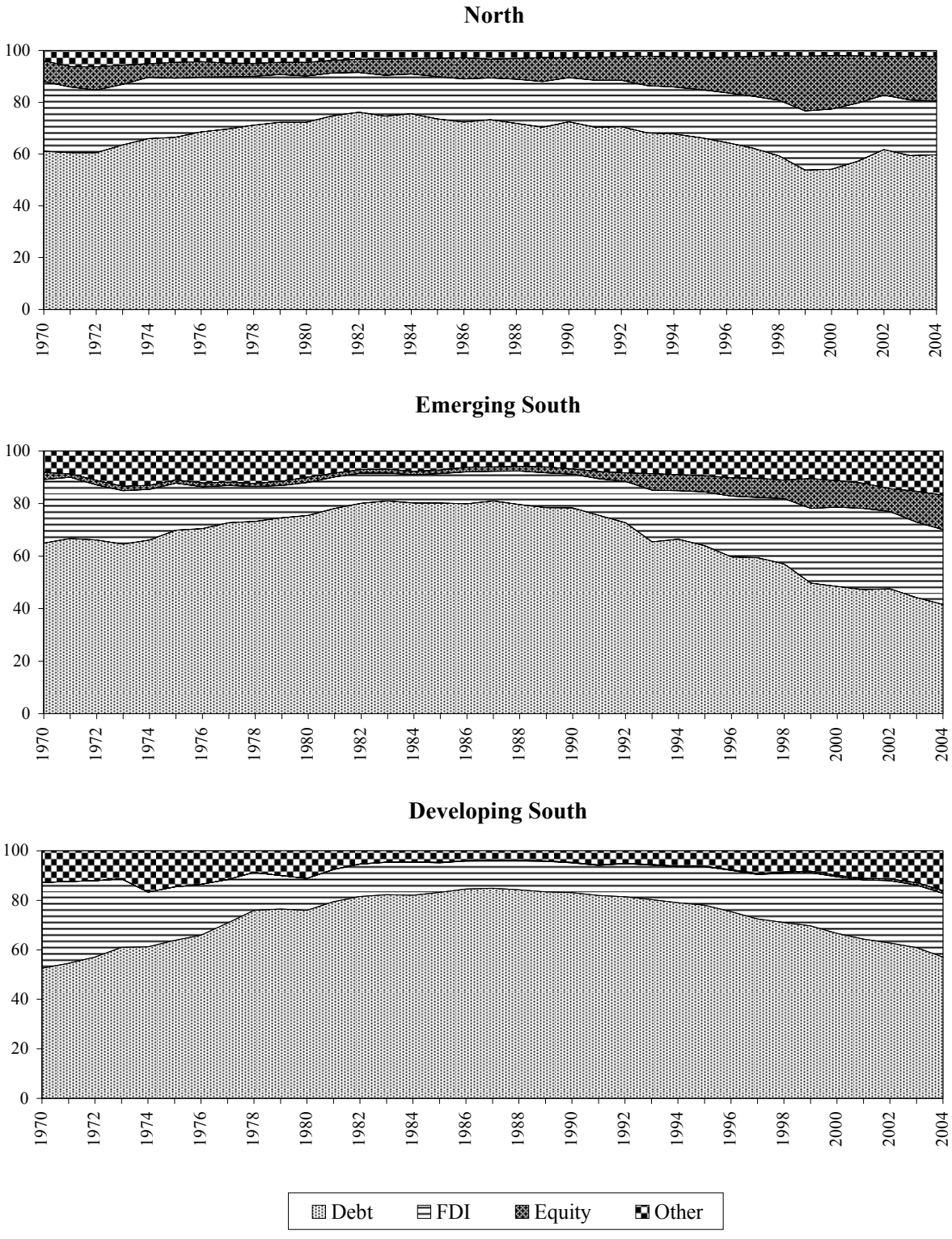
Notes: These figures show the fraction of the total export and import flows directed towards each group. Trade flows are calculated by aggregating the bilateral export and import data of countries in each group. The breakdown of the total world trade is calculated by aggregating the total merchandise exports and imports of each country in the sample and then calculating the fraction of group-wide export and import volumes in the total trade. The sum of the shares for the North, Emerging South, and Developing South does not add up to 100 because of the presence of other countries that are not included in the sample of 106 countries. Trade with those countries, however, are included in the total merchandise trade.

Figure 4A. Financial Integration
(Gross International Financial Assets and Liabilities, trillions of U.S. dollars)



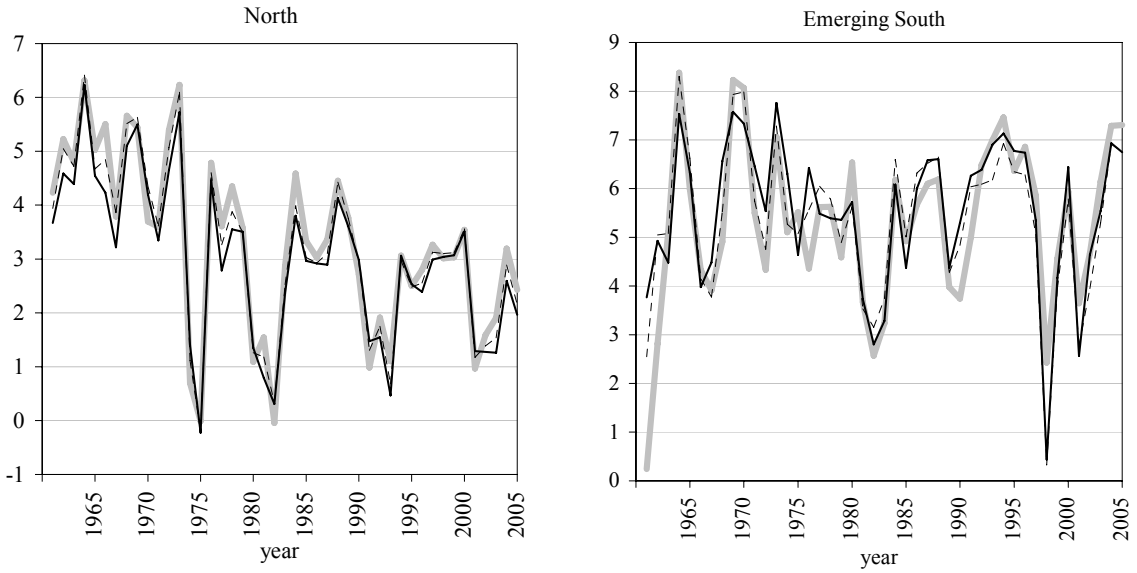
Notes: These figures show how the different components of total financial assets and liabilities evolve over time. Debt includes both official and unofficial debt. The category "Other" includes financial derivatives and total reserves minus gold.

Figure 4B. Composition of Financial Assets and Liabilities
(in percent)



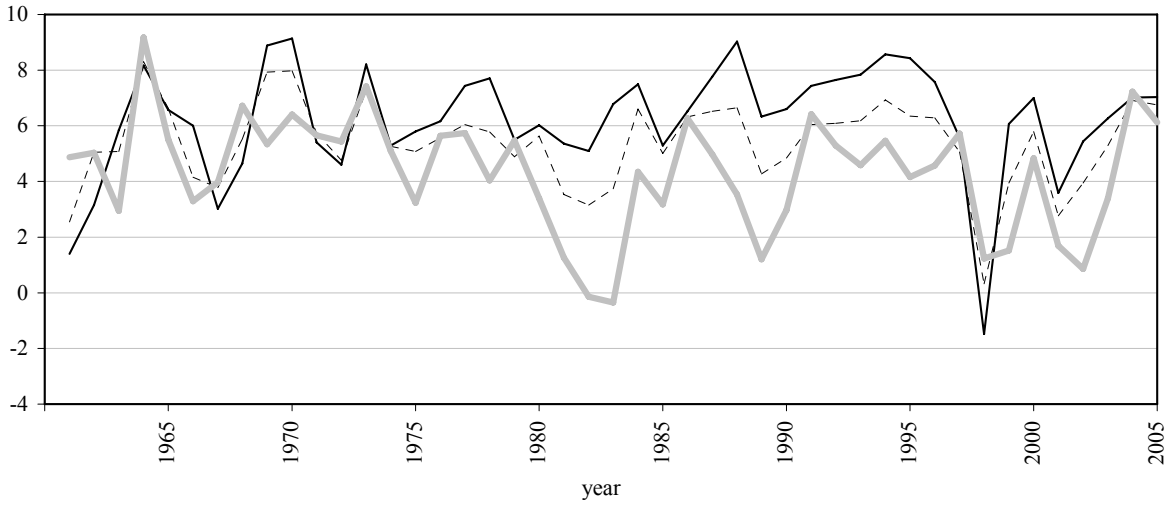
Notes: These figures show the composition of total financial assets and liabilities. Debt includes both official and unofficial debt. The category "Other" includes financial derivatives and total reserves minus gold.

Figure 5A. Comparison of Group-Wide GDP Indices



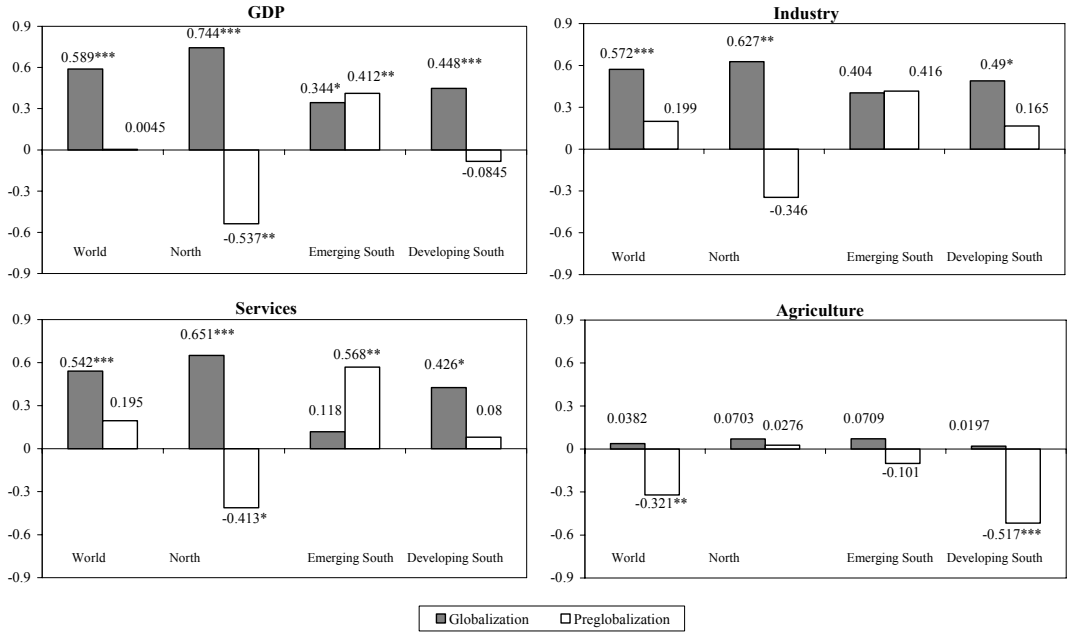
Notes: These figures present the output and trade weighted North and Emerging South GDP growth indices. Gray lines refer to the output weighted indices of North and Emerging South GDP growth. Black lines refer to the averages of the North or Emerging South trade weighted indices of the North countries. Dashed lines refer to the average of trade weighted North or Emerging South indices of all the countries in the sample.

Figure 5B. Comparison of Trade Weighted Emerging South GDP Growth across Different Geographical Regions



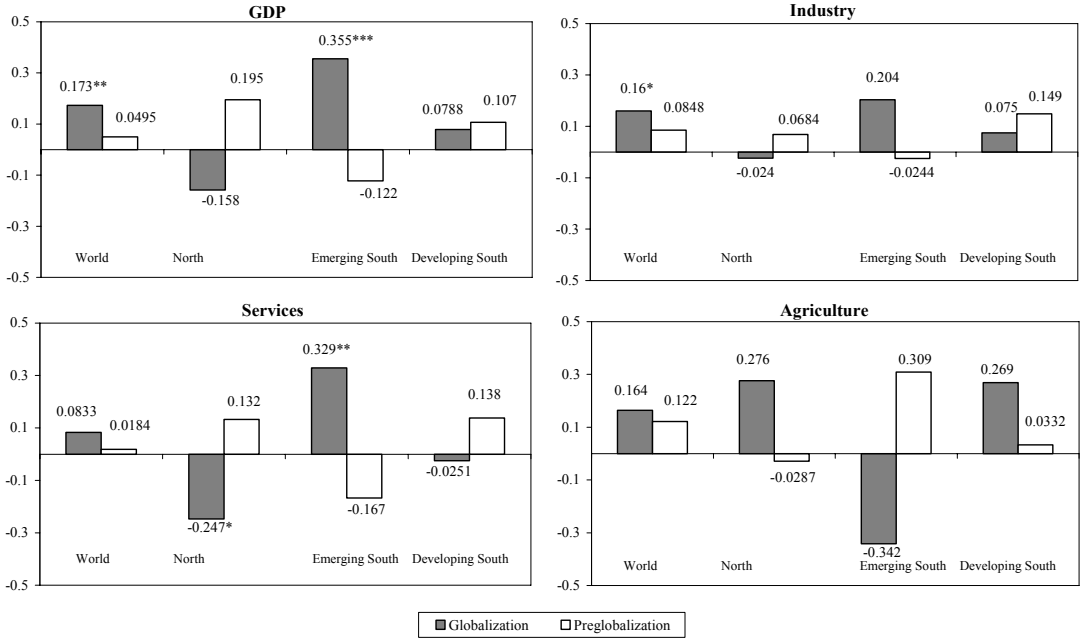
Notes: These figures present the trade weighted Emerging South GDP growth indices for different geographical regions. Dashed line refers to the average of trade weighted Emerging South indices of all the countries in the sample. Black line (gray line) refers to the averages of the Emerging South indices of countries from Asia (Latin America and the Caribbean). The averages are derived using the data series of both developed and developing countries if they belong to the same group.

Figure 6. Growth Impact of the North
(Coefficient Estimates from the Benchmark Regressions)



Notes: These figures show the coefficient estimates from the benchmark growth regressions. The globalization and pre-globalization effects of the North and the Emerging South GDP and sectoral growth are obtained from the coefficient estimates reported in Table 10 and Appendix IIB. The top left panel show that a one percentage point increase in the North GDP growth is associated with a significant increase of 0.74 percentage points in the GDP growth of the North countries during the globalization period and this impact was lower by 0.54 percentage points at 5 percent significance level during the pre-globalization period. The symbols *, ** and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.

Figure 7. Growth Impact of the Emerging South
(Coefficient Estimates from the Benchmark Regressions)



Notes: See figure 6.

Appendix I. Summary Statistics
(Obtained from the Sample Used in the Benchmark GDP Growth Regression)

Variable	Obs	Mean	Std. Dev.	Min	Max
GDP	803	3.90	2.88	-7.12	18.24
Industry	754	4.45	5.03	-15.35	40.63
Services	753	4.16	4.00	-15.93	60.79
Agriculture	757	2.50	3.35	-10.07	28.16
Northern GDP	803	3.16	1.13	1.05	7.36
Emerging South GDP	803	5.36	1.53	-0.82	10.96
Northern Industry	803	2.66	1.78	0.09	9.75
Emerging South Industry	803	5.99	2.31	-1.78	15.51
Northern Services	803	3.32	1.02	0.56	7.39
Emerging South Services	803	5.58	1.78	0.05	17.08
Northern Agriculture	803	1.53	1.53	-2.15	7.60
Emerging South Agriculture	803	2.86	1.36	-6.27	11.71
log (Initial Percapita GDP)	803	8.30	1.13	5.92	10.46
Population Growth	803	1.92	1.13	-5.15	8.11
Investment / GDP	803	20.94	8.46	3.12	73.11
Government Spending / GDP	803	16.98	8.47	0.94	63.88
log (100 + Inflation)	803	4.75	0.34	4.57	8.80
Secondary Education (15+)	803	23.10	17.25	0.00	73.10
Ave_sachswarner	755	0.56	0.48	0.00	1.00
FDI-Portfolio Inflows	631	22.42	34.14	0.0003	440.98
Manufacturing Exports	707	39.28	30.67	0.27	96.27
Oil Price	803	13.05	21.32	-5.28	63.80

Appendix IIA. Coefficient Estimates of the Benchmark GDP Growth Regressions Using Output-Weighted Indices

	GDP			
Variable	Whole Sample	North	Emerging South	Developing South
	(1)	(2)	(3)	(4)
Northern GDP	0.645***	0.842***	0.43	0.611***
	[0.14]	[0.21]	[0.28]	[0.21]
Northern GDP * D pre-globalization	0.137	-0.466*	0.601	0.0521
	[0.17]	[0.23]	[0.43]	[0.27]
Emerging South GDP	0.512***	-0.0204	0.992***	0.598***
	[0.12]	[0.11]	[0.23]	[0.19]
Emerging South GDP * D pre-globalization	-0.0261	0.15	-0.162	0.00918
	[0.11]	[0.14]	[0.25]	[0.19]
Observations	803	198	192	413
R-squared	0.25	0.57	0.44	0.23

Notes: The dependent variable is 5-year average of real GDP growth. The North and Emerging South GDP refer to the 5-year averages of the output-weighted GDP growth indices of the respective groups. Coefficient estimates regarding standard growth variables are not reported but available from the authors upon request. Heteroscedasticity consistent robust standard errors from the pooled OLS regression are reported in parenthesis. The symbols *, ** and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.

	GDP			
Variable	Whole Sample	North	Emerging South	Developing South
	(1)	(2)	(3)	(4)
Northern GDP	0.699***	0.681**	0.406	0.611***
	[0.14]	[0.25]	[0.27]	[0.21]
Northern GDP * D pre-globalization	-0.00226	-0.583**	0.539	0.0521
	[0.17]	[0.26]	[0.46]	[0.27]
Emerging South GDP	0.614***	-0.0812	0.974***	0.598***
	[0.12]	[0.11]	[0.22]	[0.19]
Emerging South GDP * D pre-globalization	0.0723	0.241*	-0.14	0.00918
	[0.11]	[0.14]	[0.25]	[0.19]
Observations	803	198	192	413
R-squared	0.26	0.55	0.45	0.23

Notes: The dependent variable is 5-year average of real GDP growth. The North and Emerging South GDP refers to the 5-year averages of the output-weighted growth indices of the respective groups. Each of the North and Emerging South countries has a respective country-specific output-weighted group-wide GDP index calculated by adjusting the PPP weights for the rest of the corresponding group. Coefficient estimates regarding standard growth variables are not reported but available from the authors upon request. Heteroscedasticity consistent robust standard errors from the pooled OLS regression are reported in parenthesis. The symbols *, ** and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.

Appendix IIB. Coefficient Estimates of the Benchmark Sectoral Growth Regressions

	Industry			
Variable	Whole Sample	North	Emerging South	Developing South
	(1)	(2)	(3)	(4)
Northern Industry	0.572***	0.627**	0.404	0.490*
	[0.16]	[0.24]	[0.24]	[0.27]
Northern Industry * D pre-globalization	0.199	-0.346	0.416	0.165
	[0.2]	[0.24]	[0.29]	[0.35]
Emerging South Industry	0.160*	-0.024	0.204	0.075
	[0.09]	[0.11]	[0.14]	[0.13]
Emerging South Industry * D pre-globalization	0.0848	0.0684	-0.0244	0.149
	[0.094]	[0.081]	[0.11]	[0.17]
Observations	754	191	184	379
R-squared	0.25	0.53	0.42	0.21

	Services			
Variable	Whole Sample	North	Emerging South	Developing South
	(1)	(2)	(3)	(4)
Northern Services	0.542***	0.651***	0.118	0.426*
	[0.13]	[0.18]	[0.18]	[0.23]
Northern Services * D pre-globalization	0.195	-0.413*	0.568**	0.0798
	[0.18]	[0.23]	[0.2]	[0.28]
Emerging South Services	0.0833	-0.247*	0.329**	-0.0251
	[0.095]	[0.13]	[0.16]	[0.13]
Emerging South Services * D pre-globalization	0.0184	0.132	-0.167	0.138
	[0.098]	[0.099]	[0.12]	[0.16]
Observations	753	191	184	378
R-squared	0.17	0.56	0.37	0.15

	Agriculture			
Variable	Whole Sample	North	Emerging South	Developing South
	(1)	(2)	(3)	(4)
Northern Agriculture	0.0382	0.0703	0.0709	0.0197
	[0.075]	[0.12]	[0.1]	[0.13]
Northern Agriculture * D pre-globalization	-0.321**	0.0276	-0.101	-0.517***
	[0.13]	[0.28]	[0.2]	[0.18]
Emerging South Agriculture	0.164	0.276	-0.342	0.269
	[0.14]	[0.39]	[0.41]	[0.16]
Emerging South Agriculture * D pre-globalization	0.122	-0.0287	0.309	0.0332
	[0.1]	[0.27]	[0.22]	[0.15]
Observations	757	191	184	382
R-squared	0.09	0.1	0.1	0.1

Notes: The dependent variables are 5-year averages of annual industry, services and agriculture value-added growth at constant local currency. Coefficient estimates regarding standard growth variables are not reported but available from the authors upon request. The North and Emerging South sectoral activity refer to the 5-year average growth of the country specific trade-weighted indices of the respective groups. Heteroscedasticity consistent robust standard errors from the pooled OLS regressions are reported in parenthesis. The symbols *, ** and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.

Appendix III. Coefficient Estimates of the Full Model for the GDP Growth Regressions

	GDP				GDP			
Variable	Whole Sample	North	Emerging South	Developing South	Whole Sample	North	Emerging South	Developing South
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Northern GDP	0.654***	0.701***	0.325**	0.539***	0.610***	0.818***	0.3	0.291*
	[0.11]	[0.19]	[0.15]	[0.17]	[0.11]	-0.19	[0.21]	[0.17]
Northern GDP * D pre-globalization	0.0539	-0.658*	0.498**	-0.157	-0.0517	-0.609**	0.642**	-0.339
	[0.15]	[0.34]	[0.23]	[0.22]	[0.19]	-0.27	[0.28]	[0.25]
Emerging South GDP	0.199***	-0.223**	0.297**	0.149	0.237***	-0.109	0.341**	0.194*
	[0.067]	[0.097]	[0.12]	[0.11]	[0.08]	-0.097	[0.12]	[0.11]
Emerging South GDP * D pre-globalization	0.0413	0.282	-0.122	0.112	0.027	0.286*	-0.238	0.077
	[0.1]	[0.19]	[0.16]	[0.17]	[0.12]	[0.16]	[0.17]	[0.19]
Ave_sachswarner	1.506***	1.428***	0.583	1.664***				
	[0.38]	[0.48]	[0.63]	[0.4]				
FDI-Portfolio Inflows					0.00239	0.00876**	-0.00674	0.00792
					[0.0037]	[0.0032]	[0.0047]	[0.013]
Manufacturing Exports	0.0151**	0.000739	0.0158*	0.00301	0.0146**	0.00381	0.0142	0.000584
	[0.0058]	[0.0093]	[0.0085]	[0.0088]	[0.0061]	[0.009]	[0.0094]	[0.01]
Oil Price	0.00978**	0.00403	0.00659	0.0218***	0.0122**	-0.00281	0.00963	0.0274***
	[0.0047]	[0.0071]	[0.0099]	[0.0069]	[0.0049]	[0.0065]	[0.01]	[0.0073]
Observations	679	192	187	300	589	171	163	255
R-squared	0.3	0.62	0.45	0.25	0.27	0.5	0.46	0.26

Notes: The dependent variable is 5-year average of real GDP growth. Heteroscedasticity consistent robust standard errors from the pooled OLS regression are reported in parenthesis. Coefficient estimates from the standard growth variables are not reported but available from the authors upon request. The North and Emerging South GDP refer to the 5-year averages of the country specific trade-weighted GDP growth indices of the respective regions. The symbols *, ** and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.

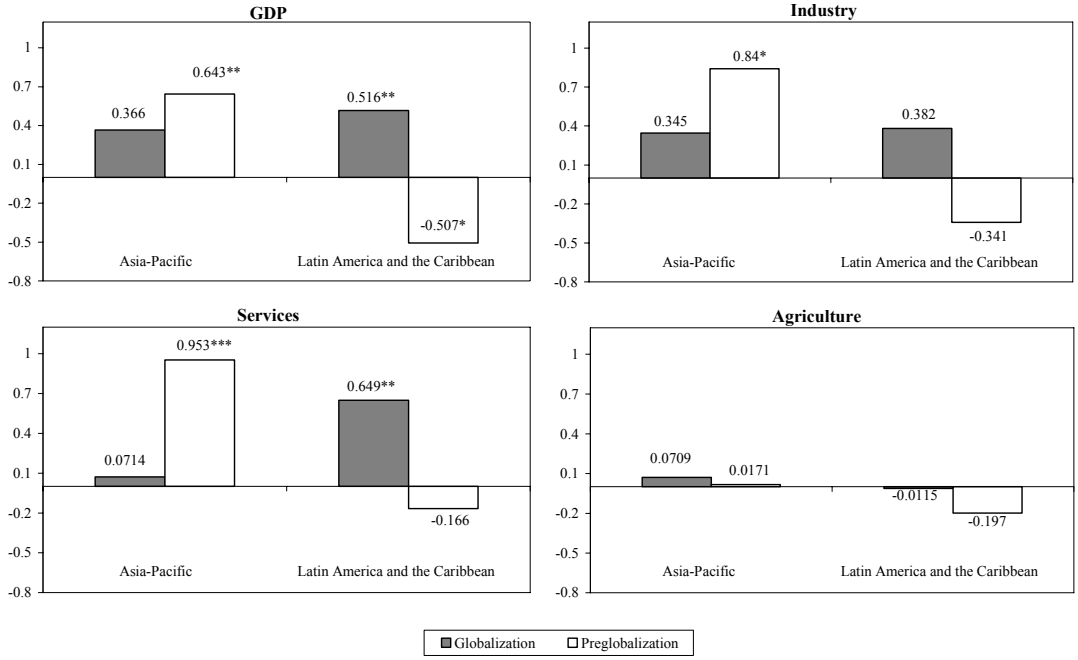
Appendix IVA. Regional Extensions of the Benchmark and Full Regression Models (GDP and Industry Growth)

	GDP			GDP		
Variable	Asia-Pacific			Latin America and the Caribbean		
	(1)	(2)	(3)	(1)	(2)	(3)
Northern GDP	0.366	0.505**	0.42	0.516**	0.657**	0.393*
	[0.23]	[0.23]	[0.29]	[0.23]	[0.23]	[0.22]
Northern GDP * D pre-globalization	0.643**	0.590**	0.822**	-0.507*	-0.16	-0.354
	[0.22]	[0.23]	[0.32]	[0.29]	[0.46]	[0.48]
Emerging South GDP	0.347*	0.432**	0.445**	0.33	0.356	0.378
	[0.18]	[0.19]	[0.18]	[0.24]	[0.26]	[0.26]
Emerging South GDP * D pre-globalization	-0.270*	-0.199	-0.314	0.41	0.144	0.135
	[0.14]	[0.15]	[0.19]	[0.28]	[0.47]	[0.46]
Ave_sachswarner		1.257			1.563**	
		[0.83]			[0.68]	
FDI-Portfolio Inflows			-0.00523			0.00254
			[0.01]			[0.019]
Manufacturing Exports		0.0170**	0.016		-0.0116	-0.0247
		[0.0078]	[0.0096]		[0.011]	[0.016]
Oil Price		0.00501	0.00535		0.0187	0.0182
		[0.012]	[0.015]		[0.015]	[0.016]
Observations	123	113	103	206	180	155
R-squared	0.36	0.38	0.34	0.34	0.42	0.36

	Industry			Industry		
Variable	Asia-Pacific			Latin America and the Caribbean		
	(1)	(2)	(3)	(1)	(2)	(3)
Northern Industry	0.345	0.601	0.366	0.382	0.654*	0.427
	[0.39]	[0.46]	[0.39]	[0.35]	[0.37]	[0.4]
Northern Industry * D pre-globalization	0.840*	0.608	1.113**	-0.341	-0.187	-0.288
	[0.46]	[0.49]	[0.5]	[0.46]	[0.46]	[0.6]
Emerging South Industry	0.315	0.434**	0.503***	0.473**	0.500**	0.520**
	[0.21]	[0.18]	[0.16]	[0.23]	[0.19]	[0.22]
Emerging South Industry * D pre-globalization	-0.184	-0.0474	-0.222	0.268	0.215	0.0985
	[0.15]	[0.22]	[0.2]	[0.3]	[0.34]	[0.36]
Ave_sachswarner		1.721			2.012**	
		[1.32]			[0.93]	
FDI-Portfolio Inflows			-0.023			0.00957
			[0.013]			[0.034]
Manufacturing Exports		0.0306	0.031		0.00763	-0.0132
		[0.024]	[0.021]		[0.021]	[0.027]
Oil Price		0.00636	0.0113		0.0418**	0.0321
		[0.024]	[0.027]		[0.016]	[0.021]
Observations	115	109	102	204	180	155
R-squared	0.25	0.28	0.32	0.28	0.39	0.3

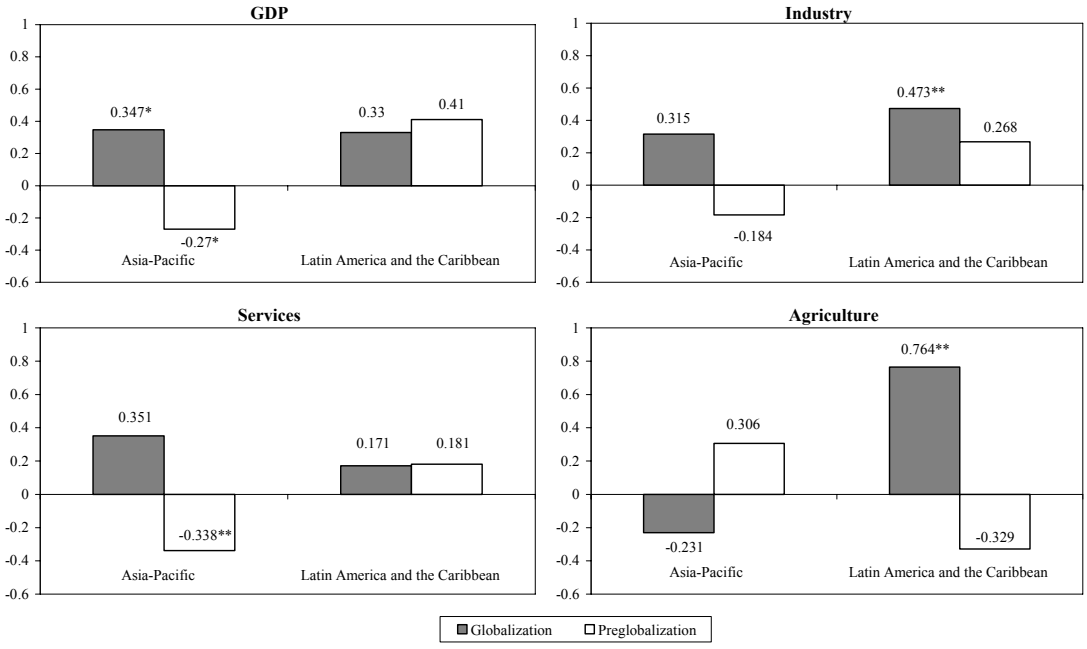
Notes: The dependent variables are 5-year averages of real GDP and industry value-added growth. Heteroscedasticity consistent robust standard errors from the pooled OLS regression are reported in parenthesis. The symbols *, ** and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively. The Asia-Pacific and Latin America and the Caribbean samples are obtained by including all the Emerging South and Developing South economies in each geographical region. The first column of the tables refers to the standard benchmark growth regressions. Columns 2 and 3 refer to the full growth model with the 5-year averages of the de-jure trade openness, FDI-Portfolio liabilities to GDP ratio and oil price change added to the benchmark specification. The North and Emerging South GDP and industry activity refer to 5-year average growth of the country specific trade-weighted indices of the respective groups. Coefficient estimates regarding export structure, openness and common shock variables as well as the globalization and the pre-globalization impact of the North and Emerging South growth are reported. Coefficient estimates from other standard growth variables are not reported but they are available from the authors upon request.

Appendix IVB.
Figure IVa. Growth Impact of the North
(Coefficient Estiamates from the Benchmark Regressions)



Notes: The benchmark pooled OLS coefficient estimates showing the globalization and pre-globalization effects of the North and Emerging South GDP growth on the Asia Pacific and Latin America and the Caribbean regions are taken from the first column of the tables in Appendix IVA and the corresponding regressions using sectoral growth rates.

Figure IVb. Growth Impact of the Emerging South
(Coefficient Estiamates from the Benchmark Regressions)



Notes: See figure IVa.

Appendix V. List of Countries

North (23)

East Asia and Pacific
Australia, Japan, New Zealand

North America
Canada, United States

Europe
Austria, Belgium, Switzerland, Denmark, Spain, Finland, France, United Kingdom, Germany, Greece, Ireland, Iceland, Italy, Luxembourg*, Netherlands, Norway, Portugal, Sweden

Emerging South (23)

Latin America and the Caribbean
Argentina, Brazil, Chile, Colombia, Mexico, Peru, Venezuela.

South Asia, East Asia and the Pacific
China, Hong Kong SAR, India, Indonesia, Korea, Malaysia, Pakistan, Philippines, Singapore, Thailand

Europe
Turkey

Middle East and North Africa
Egypt, Israel, Jordan, Morocco*

Sub-Saharan Africa
South Africa

Developing South (60)

Middle East and North Africa
Algeria, Tunisia, Syrian Arab Republic

South Asia, East Asia and the Pacific
Bangladesh, Nepal, Sri Lanka, Papua New Guinea

Latin America and the Caribbean
Barbados, Bolivia, Ecuador, El Salvador, Guatemala, Paraguay, Costa Rica, Dominican Republic, Guyana, Haiti, Honduras, Jamaica, Nicaragua, Panama, Trinidad and Tobago**, Uruguay

Sub-Saharan Africa
Benin, Botswana, Burkina Faso*, Burundi*, Cameroon, Cape Verde*, Central African Republic, Chad*, Comoros*, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire*, Equatorial Guinea*, Ethiopia*, Gabon*, Gambia, Ghana, Guinea*, Guinea-Bissau, Kenya, Lesotho, Madagascar*, Malawi, Mali, Mauritania, Mauritius, Mozambique, Niger, Nigeria*, Rwanda, Senegal, Seychelles**, Tanzania, Togo, Uganda, Zambia, Zimbabwe.

Notes: * and ** indicate the countries that are not included in the benchmark and the full model regressions due to incomplete data.

Appendix VI. Data Sources and Descriptions

GDP constant 2000 US $ constant PPP 2000 International $ constant local currency unit PPP-per capita GDP 'log (Initial Percapita GDP)"	World Development Indicators World Economic Outlook Penn World Tables 6.1 1960–2005.
Gross Fixed Capital Formation (Investment) constant 2000 USD constant local currency unit "Investment / GDP"	World Development Indicators World Economic Outlook (WEO) Penn World Tables 6.1 1960–2005
Household Consumption constant 2000 USD constant local currency unit	World Development Indicators World Economic Outlook (WEO) Penn World Tables 6.1 1960–2005
General Government Final Consumption Expenditure (Government Spending) constant 2000 USD constant local currency unit "Government Spending / GDP"	World Development Indicators World Economic Outlook (WEO) Penn World Tables 6.1 United Nations 1960–2005
Exports Imports constant 2000 USD constant local currency unit Trade Openness (Exports+Imports) / GDP	World Development Indicators World Economic Outlook (WEO) United Nations 1960–2005 Authors' calculation using the ratio of constant 2000 USD values of sum of exports and imports of goods and services over constant 2000 USD GDP.
Agriculture, value added Industry, value added Services, value added constant 2000 USD constant local currency unit	World Development Indicators UN Yearbook of National Account Statistics National Accounts Statistics of OECD 1960–2005
Bilateral Exports Bilateral Imports Total Exports Total Imports	IMF Direction of Trade Statistics 1960–2005
Consumer Price Index (CPI) "Inflation"	World Economic Outlook 1960–2005 For the panel estimation log (100+ 5 year average of % Inflation) used.
Average 3 spot price index of crude oil "Oil Price"	IMF International Financial Statistics 1960–2005 For the panel estimation 5 year averages of % oil price changes used.

"Population Growth"	World Development Indicators 1960–2005
Human Capital –Education "Secondary Education (15+)"	Robert J. Barro and Jong Wha Lee (2000) "International Data on Education Attainment" Level of human capital measured as the total percentage of the total population aged 15 and over with the secondary school attainment. For the panel estimation 5 year averages of education measure used.
Fuel exports and imports "Primary Fuels" Agricultural raw materials exports and imports Food exports and imports Ores and metals exports and imports "Primary Non-Fuels" Manufactures exports and imports	World Development Indicators 1960–2004 All as % of merchandise exports and imports.
Merchandise exports Merchandise imports	World Development Indicators 1960–2004
Dates of official financial liberalization based on stock market liberalization and removal of restrictions on foreign investment	Bekaert, Geert, Campbell R. Harvey and Christian Lundblad, 2005, "Does Financial Liberalization Spur Economic Growth?" *Journal of Financial Economics,* Vol. 77 (July), pp. 3–55.
Financial Stocks Series "FDI-Portfolio Inflows/GDP"	Lane, Philip R. and Milesi-Ferretti, Gian Maria (March 2006) "The External Wealth of Nations: Revised and Extended Estimates of Foreign Assets and Liabilities, 1970–2004" IMF Working Paper No. 06/69 All data are annual and reported in millions of current U.S. dollars. 1970–2004.
Bilateral Intra-Industry Trade Intensity Period average of the Grubel-Lloyd Index constructed using bilateral annual exports and imports of product k between country i and country j for 81 industries using four-digit (ISIC) classification.	Trade and Production Database by Nicita and Olarreaga (2006) online available at http://www.worldbank.org/research/trade. Dataset is originally constructed from UN Comtrade Database. Data is available for 1976-2004. (An earlier version of the dataset (1976–99) is used in this paper) $Intratrade_{\tau}(i,j) = \frac{1}{T}\sum_{t}\ (1 - \frac{\sum_{k}\left\lvert X^{k}_{i,j,t} - M^{k}_{i,j,t}\right\rvert}{\sum_{k}(X^{k}_{i,j,t} + M^{k}_{i,j,t})})$
Sachs-Warner Trade Liberalization Measure "Ave_sachswarner"	Sachs and Warner Trade Liberalization dummy from 1950–1992 is constructed by Sachs and Warner (1995) and updated for 1990–1999 period with the years of full liberalization for each country by Wacziarg and Welch (2003)