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Abstract

In the 1950s and 60s, in Latin America structuralism was considered as the preeminent form of analysis of economic development and growth. Nowadays, in contrast, as a mode of analysis structuralism is distinctly unfashionable, and has been superceded by newer endogenous growth theories, which build on earlier neoclassical contributions. Beyond broad endorsements of enhancing human capital, promoting infrastructure provision and the importance of sustaining investment levels, it is arguable whether endogenous growth theories been able to shed much light on the dynamics of growth. This paper revindicates the utility of structuralist analysis in the analysis of Latin American growth patterns. Through some simple empirical tests, it explores the relationship between economic growth and structural performance. Using as high a level of disaggregation as the data allows, we use dynamic panel data analysis together with a steady state model to calculate the elasticities of sectoral growth to overall output. The implications for resource allocation and policies to promote particular sectors are discussed.

1. Introduction

Traditionally, one of the enduring concerns of Latin American economists has been the low level of industrial development and an overdependence on the export of primary materials (see, inter alia, Singer and Prebisch 1953; Ocampo and Parra, 2003). This concern is based on a fundamental belief that a developed economy is an industrialized economy (Kregel, 2007). Indeed, during the fifties and sixties manufacturing was very much the "*fair-haired child of most third-world governments*" (Reynolds, 1983:93) In the last two decades, however, the issue has taken a backseat in discussions of development strategy, as economic policymakers have focused on problems related to liberalization and macroeconomic stabilization. Purposely promoting industrial development has been much frowned upon during the last two decades. Anne Krueger (2007) has been one of the most outspoken critics of such policies:

> *"Focusing on industrialization as a policy objective is almost certainly wrong. Mechanization and increasing productivity in all sectors usually leads to more rapid growth in industry than of other sectors, but that is the outcome of appropriate policy. While it highly likely that growth of agricultural productivity – a necessary part of overall economic growth – will shift returns to induce movement of workers to industrial (and service) activities, a focus on industrialization as an instrument, rather than an outcome, can lead to low growth if not stagnation*"

In contrast, other authors (e.g. Hausman and Rodrik, 2003:697) argue that a 'laissez faire' attitude is hardly likely to achieve the desired consequences in terms of structural diversification and technological dynamism of the economy, and that the identification of 'leading sectors' is still incumbent upon on the government:

> "*Laissez-faire leads to under-provision of innovation and governments need to play a dual role in fostering industrial growth and transformation. They need to encourage entrepreneurship and investment in new activities ex ante, but push out unproductive firms and sectors ex post. This is of course easier said than done. The specifics of how this can be managed is likely to differ considerably from country to country, depending on administrative capability, the prevailing incentive regime, the flexibility of the fiscal*

> *system, the degree of sophistication of the financial sector, and the underlying political economy*."

As a point of departure, this paper takes an agnostic view on these debates, and is not intended to be proscriptive in its arguments. By empirical analysis of the data, we try to determine which have been the sectors which have most contributed to the dynamism of the Latin American economies over the long run. In common with previous studies (e.g. Wells and Thirlwall (2003), who test the applicability of Kaldor's growth laws for African countries, and also Libanio (2006), who carries out his analysis on a group of Latin American countries), the paper revindicates the importance of the manufacturing sector for economic development in the region. But we also find a more nuanced conclusion. In particular, we study in some depth whether other potential 'engines of growth' exist outside the manufacturing sector and find that, with the rise of the so-called 'new economy', certain groups of service sectors can also serve as catalysts for faster growth. Following Palma (2005), these results are put in perspective of the debates on 'deindustrialization', and it is argued that Latin America has suffered from policy-induced deindustrialisation rather than from a natural shift towards services and other sectors. The causes and implications of this process for development strategy are discussed.

The structure of the paper is as follows. In Section 2, we provide an overview of both theoretical and empirical views of structural change in the region. Section 3, which presents our own empirical results, is sub-divided into different parts. Results into the analysis of 'leading sectors' are compared between different methodologies, in part A using static panel estimates of Kaldorian sectoral growth elasticities, in part B a dynamic panel data analysis and a steady-state model. Given the results in previous parts, which suggest a strong relation between service sector and overall growth, in part C we analyse the services sector in more detail. In part D some simple tests of causality are utilized. Finally, in Section 4 conclusions are drawn and some observations for policymakers are made.

2. Theoretical and empirical views on Structural Change in Latin America

Early development economists addressed the problem of industrialization through different strategies aimed to catalyse broader development. These ranged from the big push ideas put forward by Rosenstein-Rodan (1957) and the balanced-unbalanced growth controversy that followed, to the dual sector Lewis model (1954) and Kaldor's growth laws (1966). Whatever their differences, these views shared some fundamental insights into the development process. Development and its synonym industrialization were not, and indeed according to these theorists could not be, conceived in static terms as in Ricardian theory. This meant dispensing with the concept of full employment which is at the basis of optimal resource allocation theory. This approach also led to the introduction, early on, of the notion of increasing returns to scale. Increasing returns to scale are at the core of Rosenstein-Rodan big push as well as Lewis and Kaldor's views. The notion of increasing returns to scale provided the foundations for the study of structural change.

The dynamics of economic development necessarily involved the analysis of the interaction between economic sectors.[2] Historically, at the time when these early development views were put forward the interaction analysis was mainly carried out in terms of dual sector analysis involving agriculture and industry (manufacturing). The relations between sectors were conceived in fairly simple terms. In the most known approach industry (manufacturing) would absorb the surplus labour emanating from agriculture allowing the sector to increase its productivity and standard of living. The improvement in agricultural conditions would allow the sector to generate a demand for manufacturing products, thereby creating the conditions for sustained growth and development.

The analysis even when framed in its most modern guise (Murphy, Shleifer, and Vishny, 1989) had some fundamental implications for economic development. Industrialization resulted from the coordination of investment plans and decisions across sectors; complementarities between sectors worked through market size effects; the whole process of development and industrialization required a certain degree of government intervention.

[2] A general plea for "structuralist" analysis of Latin America economic problems is to be found in Osvaldo Sunkel, "El trasfondo estructural de 1os problemas del desarrollo latinoamericano," Trimestre Economico, XXXIV (Jan.-Mar. 1967), 11 58. For an interpretation of structuralism as a strategy for problem-solving, see Albert Hirschman, "Journeys Toward Progress" (New York: Twentieth Century Fund, 1963) pp. 210-16 and 231.45.

In the last two decades, the industrialization-manufacturing debate has taken a backseat in discussions of development strategy, as economic policymakers have focused on problems related to liberalization and macroeconomic stabilization under the guidance of the Washington Consensus. Nonetheless, the recent development of Latin American economies marked by the prioritization of commodities as the only way to bring these economies out of their current level of stagnation have brought back the industrialization and structural change debate to the forefront.

In this context, the 1980's debt crisis marked a break point in the long term growth trajectory of Latin American economies. The decomposition of the GDP per capita clearly shows a decline in the long term trend (Figure 1) (though with a marked recovery since 2003).

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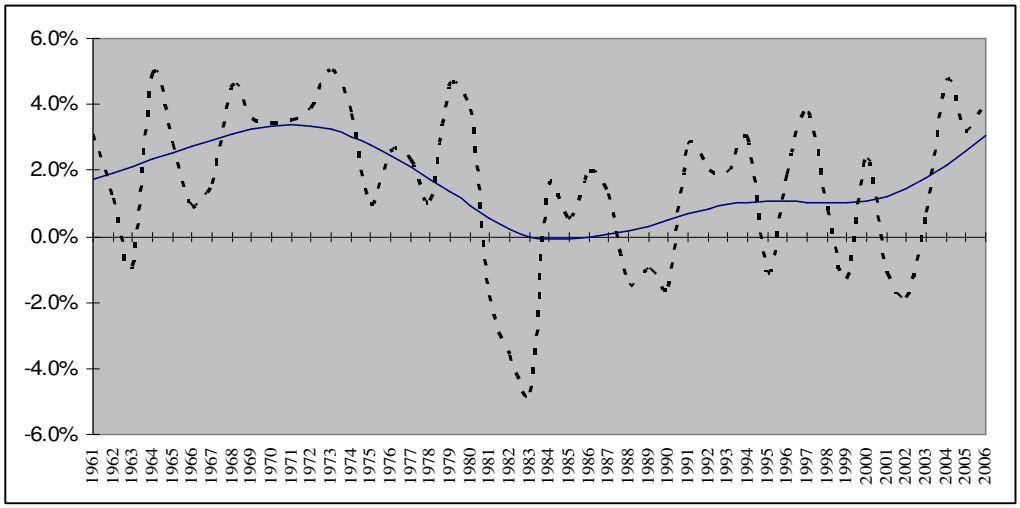
Figure 1: Latin America 1961-2006. Actual rate of growth and its trend component (Hodrick-Prescott Filter Method).



Source: On the basis of World Development Indicators (2008). World Bank.

Latin American countries addressed the debt crisis by a dramatic shift in their economic policies, away from the previous policies of state led intervention and towards a more liberal model, based on the Washington Consensus (Williamson, 2003; Bulmer Thomas, 2003). Despite the fact that between 1963 and 1980 there was a long period of sustained economic growth in the region, and quite notable structural change occurred towards manufactures (though the same was not true of exports), conventional wisdom deemed these policies unsustainable and, under the tutelage of

organizations like the World Bank and the IMF, practically the whole continent shifted towards more liberal policies.

The switch of policies did not deliver the kind of economic performance that their proponents anticipated.[3] For one thing, the policies never delivered outside the reduction in the inflation rates, better economic performance. Growth rates turned out to be much lower during the market liberalization experience, and Latin American countries were never able to improve their competitive potential. They learned to export but also became more apt at importing, leaving the region still highly dependent on external finance for its balance of payments, a situation that was only to change with the commodity price boom which started in 2003. More pointedly, notwithstanding progress in certain areas, some important structural characteristics of the Latin American economies barely changed over the whole period of reforms. Strikingly, the amount of manufacturing value added per capita has remained almost constant over the last 25 years. Indeed, according to UNIDO figures, it is actually below the figure achieved at the end of the 1980s (Table 1). China, over the same period, managed to multiply by a factor of six its manufacturing production per capita.[4]

Table 1: Per-capita MVA in constant (1995) US $

Country group	*1981*	*1986*	*1991*	*1991*	*1995*	*2000*	*2005*
Developed market economies	4153	4444	4942	4942	5086	5699	5949
Transition economies	655	721	723	723	450	540	814
Developing regions:							
Sub-Saharan Africa	32	32	31	31	28	29	30
North Africa	128	152	156	156	159	185	197
Latin America and Caribbean	**807**	**701**	**669**	**669**	**687**	**731**	**769**
South and East Asia	92	113	164	164	214	260	329
China**	90	125	169	169	263	380	559
West Asia and Europe	416	472	485	485	514	590	706

Source: http://www.unido.org/data/UNIDO/Stats/Staworld2.cfm?c=GHA

[3] There is one important caveat here that must be borne in mind. Between 2003-7 economic growth in per capita has recovered, and has in fact been the strongest seen the decade of the 1960s (ELCAC, 2007). Nevertheless, it is arguable whether this corresponds to a belated payoff from the NEM, or is better attributed to a rise in commodity prices.

[4] As UNIDO (2006:150) show, MVA is a good proxy for a number of other important indicators of development, being highly correlated both with the share of manufactured exports and technologically-more advanced production.

As a consequence of this apparent inability to raise manufacturing per capita, the share of manufacturing in GDP has actually fallen since the early 1990s, as reflected in Table 2. In some countries, the scale of this deindustrialisation has really been quite pronounced. The explanation in some cases is obviously related to the boom in oil production or commodity production (countries like Ecuador, Venezuela or Bolivia), but there has also been a quite clear trend towards deindustrialisation in countries like Uruguay, Jamaica and Panama, as well as a significant increase in the participation of services, like in the case of Argentina (from 44 to 66 percent), Mexico (56 to 64 percent), and Peru (32 to 52 percent). The share of manufacturing in GDP has also declined in larger countries of the region like Brazil, Colombia and Mexico.

Table 2: Manufacturing Sector as a Share of GDP, 1990-2004

	1990	*2004*	*Change*
Argentina	23.9	22.3	-1.7
Bolivia	17.0	12.4	-4.6
Brazil	22.8	21.5	-1.3
Chile	17.0	17.0	0.0
Colombia	18.0	14.4	-3.6
Costa Rica	20.4	19.6	-0.8
Ecuador	19.4	4.7	-14.7
El Salvador	21.7	22.0	0.3
Honduras	14.5	18.0	3.5
Jamaica	18.6	12.5	-6.0
México	19.0	16.3	-2.7
Panama	12.9	7.2	-5.6
Paraguay	17.1	14.2	-2.9
Peru	18.2	14.9	-3.3
Dominican Republic	26.4	24.1	-2.3
Uruguay	28.0	21.3	-6.6
Venezuela	27.2	17.1	-10.1
Latin America and the Caribbean a/	*21.2*	*17.8*	*-3.4*
Latin America a/	21.4	18.0	-3.4
Caribbean	9.7	7.8	-1.9

Source : ECLAC database

This story is all the more surprising because of a few notable cases of success in promoting manufacturing exports in the region in countries such as Mexico, Brazil, Central America and the Dominican Republic and Mexico (Agosin, 2006). In both the cases of Central American countries

and Mexico there has been a sharp shift in the composition of exports, from an extremely high dependence on agriculture and natural resources (oil) towards a highly diversified export structure. Currently, in the cases of Central American countries and Mexico (El Salvador, Guatemala, Honduras, and Mexico) more than 70 percent of exports are manufactures (table 3).

Table 3

Central America: Main Export Products as a Percentage of the Total, 1990 – 2005

Countries	Products	Years				
		1990	1993	1996	1999	2005
Costa Rica	Machinery	4.6	5.7	8.1	43.9	38
	Fruits and nuts	22.8	22.4	20	13	15
	Textiles and apparel	37.4	41.2	35.5	20.8	8
	Subtotal	64.8	69.3	63.6	77.7	61
El Salvador	Textiles and apparel	22.8	51.5	67.2	82.8	81
	Coffee and tea	36.1	20.2	4.9	4.2	2
	Electrical machinery	10.3	6.5	3.1	1.9	1
	Fish and mollusks	5.2	4.3	3.7	1.7	0.5
	Subtotal	74.4	82.5	78.9	90.6	84.5
Guatemala	Textiles and apparel	24	45.8	47.7	54.9	84.5
	Coffee	23.7	12.9	15.6	13.4	9.2
	Fruits and nuts	15.3	11.6	10.8	8.6	12.2
	Fossil fuels	2.9	2	3.6	4.2	4.5
	Subtotal	65.9	72.3	77.7	81.1	84
Honduras	Textiles and apparel	22.9	55.6	69	80.9	71.2
	Fish and mollusks	12.6	9.9	5.7	4	4.1
	Fruits and nuts	12	14.6	10.9	1.9	4.3
	Coffee and tea	9.5	3.2	2.2	1.9	1.7
	Subtotal	57	83.3	87.8	88.7	81.3
Average	Textiles and apparel	26.8	48.5	54.9	59.9	54.0
	Fish and mollusks	8.9	7.1	4.7	2.9	7.0
	Fruits and nuts	12.7	11.3	10.3	7.2	10.2
	Coffee and tea	23.1	12.1	7.6	6.5	5.7

Source: Module to Analyse the Growth of International Commerce (MAGIC, 2001); Markus Rodlauer and Alfred Schipke, eds. Central America: Global Integration and Regional Cooperation. IMF Occasional Paper 243. July 2005.

Yet at the same time, manufacturing value added as a share of GDP over the same period has actually contracted or stagnated, and the overall growth performance has been poor. Why such a

dichotomous performance should occur is open to dispute, but might be associated with a slow 'maquilizacion' of these economies, whereby domestic industry is 'hollowed out' by a raising share of imported intermediates (and a concomitant increase in the import elasticity of income) and a subsequent collapse of the export multiplier.[5]

Even in the case of Chile, successful export and growth performance since the mid-1980s has been accompanied by only weak structural change and diversification towards non-traditional exports. For Chile, traditional products represented in 1995 and 2005, 63% of the total. This raises the question of whether such phenomena are naturally-induced shifts towards the tertiary sector, or the result of policy failures. Commenting on the Chilean case, Mesquista Moreira (2007) argues that:

> "*Chile of the nineties is a "domestic" natural-resource success. Yet, Chile's success (which, by the way, still has close to 40 percent of its exports linked to one single product—copper) is dwarfed by the growth, diversification and technological sophistication of the "manufacturing" East Asia and is matched by Venezuela's failure, which bears clear symptoms of Dutch Disease...Trade liberalization and the hands-off policy that prevailed throughout the nineties led these economies to a regime as close to a "neutral" system of incentives as it has ever been. The "don't-turn-your-back" kind of advice does not seem to have, then, any practical consequence*."

Does this lack of diversification matter? At one level, the answer must be a resounding 'yes' - all highly specialised countries are poor, while all developed countries are highly diversified, both in their export and production structures. There are some important theoretical reasons why greater diversification of export structure might lead to faster growth, including a decrease in volatility of export income, which might lead to more stable macroeconomic environment and faster growth (Agosin, 2006). In fact, in the 1960s and 70s under policies of import substitution a number of Latin American countries did achieve significant structural change in their domestic economies (Brazil, Mexico and Argentina being two notable examples), but their export structures remained

[5] Export multipliers collapsed in part because of the way in which the maquila industry evolved separately from the rest of the economy. But the positive impact of exports was also reduced as Mexican firms were forced to compete with US firms by copying their sourcing practices and importing an increasing share of their total imports from abroad. Hence the irony that, in spite of a massive increase of total exports, the balance of payments remained in deficit. For more details, see Mold and Rozo, 2006, Palma, 2005).

to a large extent dependent on commodities. There is a general consensus in the literature that overvalued exchange rates (part and package of the import substitution policies, at least as they were applied in Latin America) contributed to this outcome (Bulmer Thomas, 2003, Rodrik, 2007). But subsequent policies from the mid-1980s onwards under the so-called *New Economic Model* (NEM) did little better in promoting structural change. With the overriding emphasis on controlling inflation, in many countries of the region tight monetary polices (sometimes including very damaging pegs of the currency) paradoxically led to a continuation of an overvaluation of the currency, with particularly damaging consequences for the perspectives of export diversification and manufacturing employment.[6]

The practical repercussions of these sectoral shifts have been much debated. According to other analysts, the lack of structural diversification and the observed trends towards deindustrialisation in the region are nothing to be concerned about: they simply reflect a world-wide shift towards the service sector, something which is also evident in the industrialised countries. In the United States, for example, the service sector now accounts for around 70 per cent of the economy, yet this development apparently worries few people. To borrow Krugman's phrase, the economy is becoming increasingly 'light'. In the case of Latin America, the share of services rose on average from 49% to 56% between 1970-1979 and 1991-2001 (Table 4). In employment terms, the impact is generally considered to have been negative - manufacturing firms have a greater employment-generating potential than the service sector, not only through the direct employment deriving from the initial investment, but also through the "feedback" into the rest of the economy via forward and, especially, backward linkages.[7] Given their contribution to the exportable sector, a lack of dynamism in manufacturing can also have a negative impact on the trade balance, with countries displaying a weak manufacturing sector often also reporting poor balance of payments results.[8] Services, on the other hand, are only partially tradable, and may not be able to offset the fall in

[6] In many countries trade liberalization occurred just as capital returned to Latin America. The net inflows pushed up the value of the real exchange-rate and encouraged imports, but not exports. This was the problem in Mexico from 1990 to 1994, in Argentina after 1991 and Brazil from 1994 to 1998. As a result, export performance in many countries was modest and Latin America's increasing share of world exports has mainly been due to Mexico (Bulmer Thomas, 2003:369-70).

[7] In view of the standard perception of the service sector as being characterised by labour-intensive activities such as hotels, restaurants and the retail trade, this may initially seem a rather surprising. But in fact the bulk of investment in service industries creates relatively few employment opportunities. Public utilities (e.g. the telecommunications sector), for example, are particularly capital intensive. Likewise, financial services are intensive in their use of financial capital and technology.

[8] See, for instance, Cairncross (1978), who associates Britain's balance of payments difficulties to the poor performance of British manufacturing sector in the post-War period.

manufacturing exports.[9] And precisely because of their tradability, manufactured goods are open to the full-force of international competition, thus making them more likely to innovate. Not surprisingly, productivity growth is typically higher in manufacturing than in services (Figure 2).

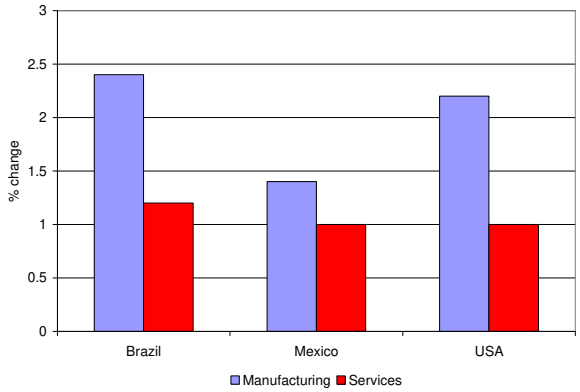
Table 4
Latin America Services valued added as % of GDP
1970-2006
Averages

	1970-1979	1980-1990	1991-2001	2002-2006
Argentina	44.8	52.3	65.6	55.2
Bolivia	45.2	47.1	52.6	55.8
Brazil	48.0	45.8	62.3	64.4
Chile	52.4	53.4	54.5	51.3
Colombia	45.6	46.8	53.6	54.7
Costa Rica	60.2	56.1	57.3	62.1
Dominican Republic	50.3	57.2	54.9	59.2
Ecuador	47.6	47.0	55.8	52.7
El Salvador		55.3	56.3	59.5
Guatemala	53.2	54.0	56.2	58.2
Guyana	41.7	44.2	31.7	42.0
Honduras	46.9	54.0	49.7	55.4
Mexico	56.2	57.6	66.4	69.9
Nicaragua			51.6	53.3
Panama		73.2	74.0	76.5
Paraguay	44.0	48.0	56.1	58.6
Peru	49.7	58.8	61.6	60.1
Uruguay		53.5	64.7	61.7
Venezuela, RB	50.7	44.8	46.4	45.0
Latin America	49.1	52.7	56.4	57.7

Source: World Development Indicators (2007). World Bank.

[9] Technological advances have changed things somewhat, and now many services that were not previously tradeable have become so – telephone call centres located in other continents being one example, facilitated by rapidly falling costs in telecommunications (itself a service industry).

Figure 2: Labour Productivity Growth by Sector, Brazil, Mexico and the USA, 1950-96 (Average Annual Compound Growth Rates)



Source: Mulder (2002:23)

As Mulder (2002:23) points out, however, the view that services have little potential for labour productivity increases may be too pessimistic and simplistic, for productivity gains have been achieved in several service industries. In this context, in his analysis of productivity trends in the US economy, Wolff (2007: 15) provides a useful distinction between the three types of service industries. *Standardized services* like transportation, communications, and utilities can behave very much like goods industries in terms of productivity performance. *Customized (traditional) services*, on the other hand, have had much lower productivity growth than goods industries – indeed, virtually zero in the post-war period. Finally, Wolff distinguishes a *hybrid services sector*, which are a mix of the first two types. Their productivity performance is lower than that of goods industries and standardized services but higher than that of the customized services. In the empirical analysis which follows, for data-availability reasons, we are not able to carry out such a breakdown, but we do attempt to distinguish between various important sub-sectors within services.[10]

[10] In Latin America, the debate is much complicated by a large informal sector. Most (though not all) informal sector activities would be classified as services. But this risks making the service sector a 'catch-all' residual for all activities not classified as either industry or primary. According to some Latin American authors (e.g. Hernando de Soto, 1989), the informal sector represents an important source of dynamism.

3. The Empirical Analysis - Methodological Considerations

Nicholas Kaldor formulated his known growth laws within a developed country context. These were initially formulated to explain the slow rate of growth in the United Kingdom (Kaldor, 1966). Kaldor's growth Laws were subject to several critiques which led him eventually to modify his position (See, Rowthorn, 1975 and Kaldor, 1975). The first law identifies the manufacturing sector as the 'engine of growth.' This proposition has been reformulated to take into account other sectors than the manufacturing sector such as mining, construction and services (McCombie et. al.,2002). The underlying idea is that the manufacturing sector, as well as other sectors, generate induced productivity effects within and outside their productive boundaries.

Expressed algebraically,

(1) $q_i = c_1 + b_i q_{gds}$

where

q_i = growth of output (gross domestic product); and

q_{gds} = growth of the 'growth driving sector'

The observed relationships are open to criticisms on several grounds. Ordinary least squares regression estimates applied to models wherein the alleged independent variable (in Kaldor's law) is not truly independent or predetermined. This is of course inevitably the case when q_{gds} is a sub-set of q_i. Partly in response to such criticisms, a different kind of test has been put forward, and that is to regress q_i on growth of all other sectors. Specified in this way, there is no overlap of dependent and independent variables. In other words,

(2) $q_i = c_1 + b_1(q_{gds} - q_{os})$

That is, the rate of growth is a function of the difference between the rate of growth of the driving sector (q_{gds}) and that of all other sectors (q_{os}). This is the basic specification that we will use in our econometric analysis.

Another methodological weakness of some previous analyses on the validity of Kaldor's First Law is that they fail to compare results in different sectors – focusing on the manufacturing sector, a

high R^2 and/or large parameter estimate are taken as evidence in favour of the 'manufacturing sector as the engine of growth' hypothesis. Yet to be in anyway meaningful, such analysis needs to be based on comparisons with other sectors. In this paper, where data availability allow, we compare the results for manufacturing with those for other sectors (agriculture, mining, services and its sub-sectors of finance, transport, retail trade, etc.).

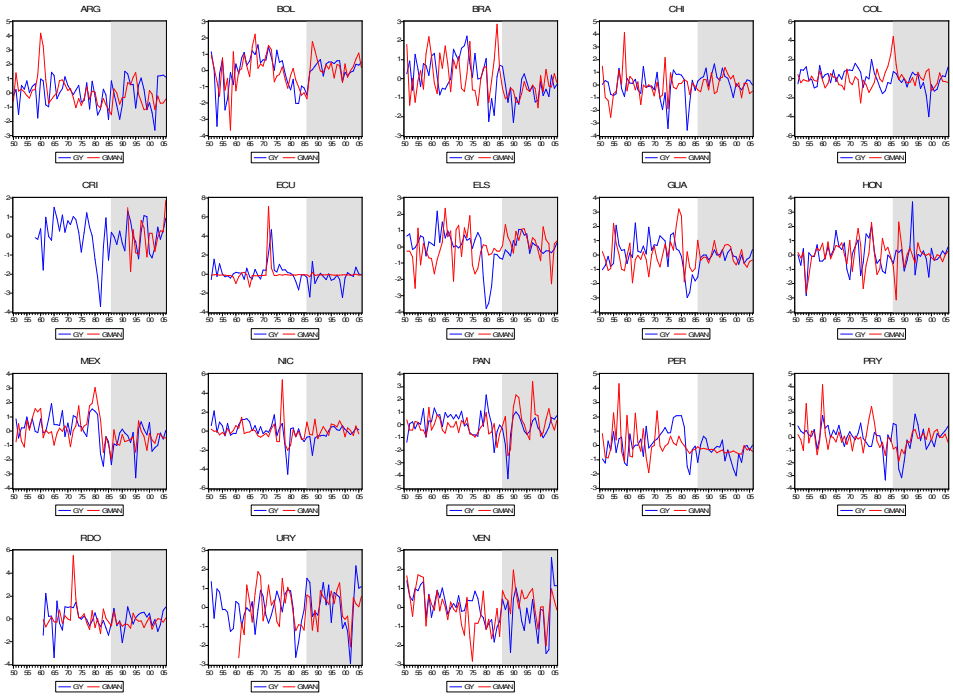
The econometric analysis was carried out on a panel of 18 Latin American countries[11], over the period 1951-2006, given a potential total number of observations of 1008 (missing data for some countries reduced somewhat the actual number of observations). Data was drawn from the ECLAC data base. The initial analysis was on the basis of four major sectoral divisions – manufacturing, services, mining and agriculture (Table 5). An important issue to be borne in mind in this kind of analysis is the poolability of the data. While sharing some basic underlying characteristics, the economies of the region display great diversity, both in terms of income per capita, industrial structure, and leading economic activities. In order to control for this, all regressions are carried out using fixed-effects, on the *a priori* assumption that the Latin American countries may display behavioural differences to the whole population of countries (the implication of using a random effects estimator – see Hsiao, 1986:42). Visual inspection alone of the data for country level data (Figure 3 and Annex Figures 1-4) show for a majority of the countries in the sample a quite a strong relationship between GDP growth and manufacturing and service growth, but far less so for the mining and agriculture.

Table 5: Sectoral Definitions

GMAN	manufacturing	GCOM	retail and wholesale trade, restaurants and hotels
GAGR	Agriculture	GTRANS	Transport, warehousing and communications
GMIN	Mining	GFIN	Financial institutions, insurance, real estate and business services
GSER	Services	GSOC	Public, social and personal services

[11] Countries included in the analysis were Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru, Paraguay, the Dominican Republic, Uruguay and Venezuela.

Figure 3: Growth rate of GDP and Manufacturing Output (normalised), 1950-2006



Source: Own elaboration, from ECLAC data.

**The broad policy shift towards WC type policies is represented by the shaded areas.*

One further point to be borne in mind is the temporal dimension of the analysis. The dataset used in this paper include data from 1950-2006. Structural change over such long periods of time are likely to exert a major influence on parameter estimates. In other words, parameters cannot be assumed to be constant over such a long-run analysis. To control for this, the analysis here includes structural dummies, based on a literature review of the reform dates for the application of the NEM (Table 6).[12] An autoregressive lag is utilized to control for serial correlation where evidence of that is present.

[12] None of the dates can of course be considered definitive – and often there is an enormous difference between announcing and actually applying reforms. Andrews-Quandt tests (an advanced application of chow-tests for structural breaks) were also tried on the whole period. Rarely, however, did the structural breaks identified coincide with the breaks in policies identified in the literature review. This is not so surprising – the countries studied often suffered great volatility in their growth rates for reasons other than policy reform – the frequency of *coup d'etats* for example. Structural breaks were also detected in several countries during the first and second oil crises. In any case, as a post-hoc method, this method was considered less satisfactory than the ex-ante rationale of attempting to control for major policy shifts.

Table 6: Dates for start of reform period

Argentina	1991	Guatemala	1988
Bolivia	1985	Honduras	1992
Brazil	1990	Mexico	1986
Chile	1975	Nicaragua	1991
Colombia	1991	Panama	1995
Costa Rica	1986	Peru	1990
Dominican Republic	1990	Paraguay	1989
Ecuador	1992	Uruguay	1978
El Salvador	1989	Venezuela	1989

Source: Elaborated from Thorp (1998:228-229), Bulmer Thomas (2003) and Cimoli and Correa (2005:52)

a) Results – Static Panel

The results of the static regressions are shown in Table 7. It is notable that while there is an apparently strong relationship between manufacturing growth and total economy-wide output (as predicted by Kaldor's law), there is even a stronger association between service sector growth and output. The static results suggest that the highest elasticities are in manufacturing and services (0.73 and 0.91 respectively). It is also notable that neither mining nor agricultural sectors seem to be highly associated with broader economic growth, with corresponding elasticities of 0.13 and 0.003 respectively – a finding which to some extent revindicates the structuralist school's predilection to reduce the dependence of Latin American economies on the primary sectors. One further observation is that while the dummy variable for policy reform is significantly positive for the manufacturing sector, it is negative for both agriculture and mining, suggesting that in these cases the reforms diminished still further the weak impact of growth of these sectors on overall economic growth (the dummy can be interpreted in the broadest sense as evidence of the reforms on spillovers from one sector to the rest).

Table 7: Static Panel Results – Major Productive Sectors

	GNOMAN	GNOAGR	GNOMIN	GNOSER
C	1.9834	3.8759	4.1412	0.2002
	11.2935	14.0799	16.0069	0.8417
GMAN	0.4081			
	25.4699			
GAGR		0.1756		
		6.8559		
GMIN			0.0017	
			0.7859	
GSER				0.8152
				23.7499
DUMMY	0.4939	-0.8055	-0.7211	0.2970
	1.8880	-1.8773	-1.7406	0.9931
AR(1)	0.2047	0.3243	0.3256	
	6.3859	10.3380	10.1925	
Adjusted R-squared	0.46	0.16	0.10	0.39
Log likelihood	-2,355.6	-2,684.7	-2,509.3	-2,517.4
F-Statistic	271.06	64.12	37.35	282.94
Durbin-Watson	1.98	1.98	1.97	1.90
Elasticity*	0.73	0.13	0.003	0.91
N.Obs	929	929	885	877
Sample	1951-2006	1951-2006	1951-2006	1951-2006

**Elasticities were calculated around the means of the dependent and independent variables.*
T values are in parenthesis.

One of the problems with the analysis above is that under the label of services sector is the largest single group of activities – accounting for between 50-60 per cent of GDP. As a consequence, a high correlation between service sector growth and the rest of the economy is hardly surprising.[13] In the following analysis, we breakdown the services sector into several sub-sectors (see Table 5 again). The results of the regressions on the sub-divisions of the service sector are shown in Table 8. As was anticipated, for the smaller sub-sectors, the estimated elasticities are somewhat lower than for the whole of the service sector. None are higher than that for the manufacturing sector (0.73). The weakest impact on overall growth is from public, social and personal services, with an elasticity of only 0.15.

[13] Note that this problem is significantly more serious than in the case of manufacturing, which typically is responsible for only 15-20 percent of GDP in countries in the region.

Table 8: Static Panel Results- Service Sector Subdivisions

	GNOCOM	GNOTRANS	GNOFIN	GNOSOC
C	2.5886	2.8042	2.5517	3.3900
	16.3021	12.0530	8.5984	11.0903
GCOM	0.3655			
	22.1370			
GTRANS		0.2091		
		12.0589		
GFIN			0.3019	
			9.3728	
GSOC				0.1633
				4.6706
DUMMY	-0.4868	-0.7772	-0.2030	-0.1864
	-1.9998	-2.2243	-0.5068	-0.4212
AR(1)		0.2213	0.2144	0.2352
		6.6106	5.8162	7.0389
Adjusted R-squared	0.3575	0.2281	0.1800	0.0967
Log likelihood	-2,375.4	-2,391.6	-2,219.8	-2,571.8
F-Statistic	249.1903	85.7058	57.2599	31.6895
Durbin-Watson	1.80	1.99	1.98	2.01
Elasticity	0.37	0.31	0.33	0.15
N.Obs	893	861	770	861
Sample	1950-2006	1951-2006	1951-2006	1951-2006

b) Dynamic analysis

The relationships between the sectoral and overall rates of growth were further examined through the use of the Generalised Method of Moments (GMM) for dynamic panel data and the use of state space econometric methodology. The choice of technique responded to three types of considerations. Dynamic panel data addresses the first two and the state space model simulation deals with the third one.

Firstly, the rate of growth may exhibit inertia and as a result should be modelled as dependent on its past values. Secondly, the explanatory variable, the sectoral rate of growth, may actually be influenced by the rate of growth of the economy, and as a result is also an endogenous variable. To control for this phenomenon of reverse causality, the sectoral and overall rate of growth of the economy should be determined simultaneously. Finally, it is to be noted that the coefficients

computed under standard static techniques can actually vary over time. State space techniques can capture the evolution of the coefficient through time. .[14].

The dynamic panel technique GMM technique proposed by Arellano and Bond (1991) consists in taking the first differences of a model which allows for the existence of a k number of lags of the dependent variable. To control for the possible correlation between the dependent variable and the error term, Arellano and Bond propose the use of the past value of the dependent variable and of the explanatory variables as instruments. Thus the GMM estimator produces unbiased and consistent estimates of the regressors as long as the instruments identified are valid instruments. To this end the econometric estimation should meet two conditions. First, the error term should not be correlated so that the estimates are not biased. Second, the explanatory variables must be weakly exogenous (or which is the same thing be valid instruments). Both of these conditions are addressed through an AR test and the Sargan test.

In order to throw further light on the relationship between the sectoral and overall rates of growth but from a long run perspective, dynamic panel cointegration tests were carried out. Cointegration testing within a dynamic panel analysis avoids the difficulties inherent to static cointegration analyses as well as the sensitivity problems of time series methods (Kelly and Mavrotas, 2003). More importantly these techniques allow for existing heterogeneity in coefficients and dynamics across countries which are bound to be present in the Latin American context as different countries exhibit markedly different sizes and heterogenous sectoral structures. As in the case with time series, testing for cointegration requires that the series in question have the same order of integration. In the dynamic panel context, the orders of integration are established through three

[14] Formally, in the general case a state space model representation for an n x 1 vector y_t, comprises two equations.

(1) $y_t = Z_t\alpha_t + c_t + \varepsilon_t$

(2)$\alpha_t = d_t + T_t\alpha_{t-1} + \nu_t$

Where Z_t is a conformable matrix, associated to the (mx1) vector of unobserved state variables α_t. T_t is a matrix of parameters; d_t and c_t are vectors that include exogenous and observable variables. The error terms ε_t and ν_t have the usual assumptions. By construction the (mx1) vector of unobserved state variables α_t follows an autoregressive process of the first order. The most used algorithm to estimate the parameters of Eqs. (1) and (2) is the Kalman filter.

standard tests. These are the Levin and Lin (1993), Im et al. (1997) and Maddala and Wu (1999).[15] The existence of cointegration between q_{gds} and ($q_{gds} - q_{os}$) are determined on the basis of the Larsson et al (1998) test which is based on Johansen´s (1988) procedure.

Table 9: Dynamic Panel – Major Sectors

	GNOMAN	GNOAGR	GNOMIN	GNOSER
GMAN	0.5144			
	4.7685			
GNONMAN(-1)	0.1564			
	1.3532			
GAGR		0.3122		
		10.8724		
GNOAGR(-1)		0.2589		
		14.6449		
GMIN			0.0101	
			2.6417	
GNOMIN(-1)			0.2482	
			4.5163	
GSER				0.8160
				106.7390
GNOSER(-1)				-0.0190
				-4.5253
DUMMY	0.9929	-1.3209	-1.3280	-0.6758
	1.2995	-4.0043	-2.2370	-10.1024
Wald test (ß=0)	22.7	118.2	6.98	11393
Sargan test-p value	0.44	0.41	0.35	0.58
Cointegration test	295.4	324.2	265.8	269.14
Elasticity	0.92	0.23	0.02	0.92
N. obs	911	911	869	841
Sample	1952-2006	1952-2006	1952-2007	1952-2006

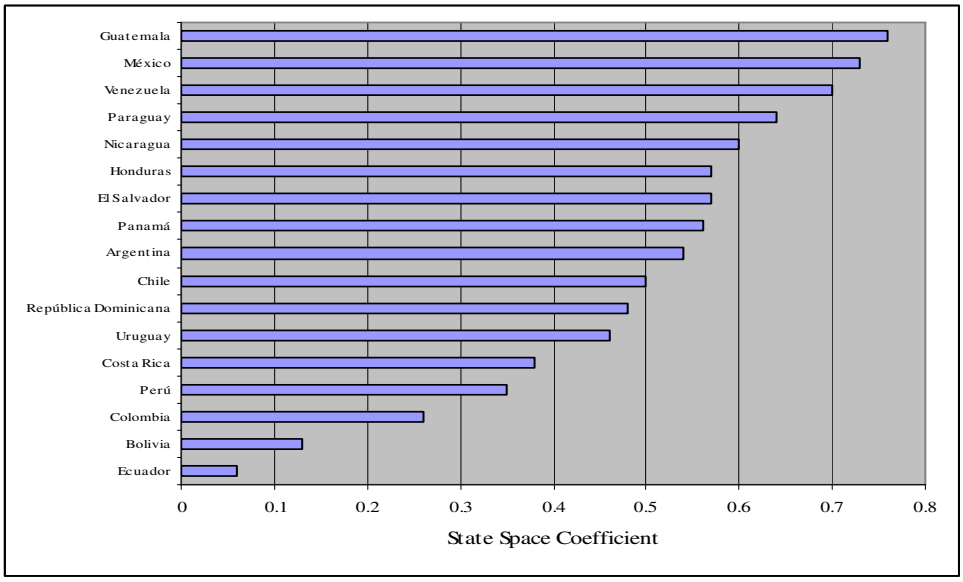
The data confirms in all cases the existence of a cointegrating relationship (Table 9), thus validating the choice of estimation techniques. The Sargan test indicates the validity of the instruments, and the absolute value of the coefficient of the lagged dependent variables is >1 which indicates that the model is stable. The major change in the parameter estimates is that the

[15] The first assumes that the lagged dependent variable is homogenous across counties. The second allows establishing whether the homogeneous lagged dependent variable hypothesis is indeed a valid one. The third has shown to have more robust properties and better performance than the first two. In particular it is said to be "robust to statistical choice, lag length in the unit root regressions and varying time dimensions fro each cross-sectional unit."

elasticity of manufacturing to total growth is considerably higher than in the static results (0.92 versus 0.73). The elasticity for the agricultural sector also considerably higher (0.23 versus 0.13), though still low in comparison with other sectors.

The analysis at the country level using state space techniques shows that the importance of the manufacturing sector to act as the 'leading' or 'motor' sector of the economy varied widely among Latin American economies. Some South American economies such as Ecuador, Bolivia, Colombia and Peru show some of the lowest values for the regression coefficient of manufacturing on the non-manufacturing sectors of the economy (0.06, 0.13, 0.26 and 0.35 respectfully). Contrarily some of the Central American economies (in particular Guatemala), Mexico and Venezuela, show the highest degree of interdependence between the manufacturing and non-manufacturing sectors of the economy. The respective coefficients of Guatemala, Mexico and Venezuela are 0.76, 0.73 and 0.7 (See Figure 4).

Figure 4: Latin America. Final value of state space coefficient for the regression of manufacturing on non-manufacturing sectors of the economy. 1970-2006.

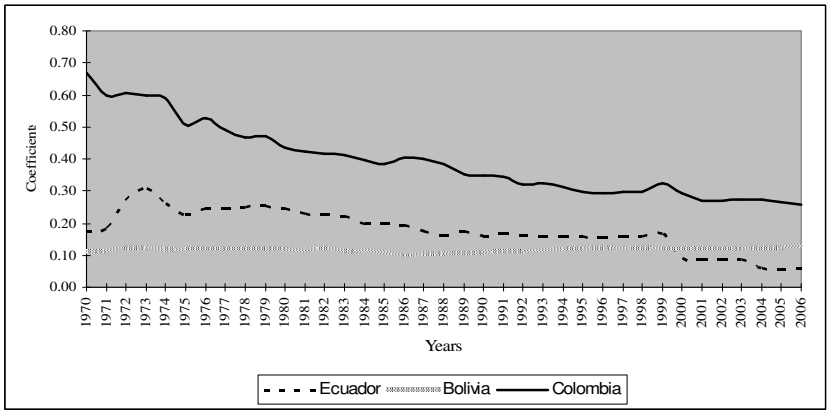


Note: All coefficients are significant at the 95% level of confidence.
Source: Own Elaboration

The cases of Ecuador, Colombia and Bolivia reflect in part on-going processes of deindustrialization and partly a growing productive specialization in the non-manufacturing sector of the economy due favourable conditions in the production of oil and metals (such as in the case

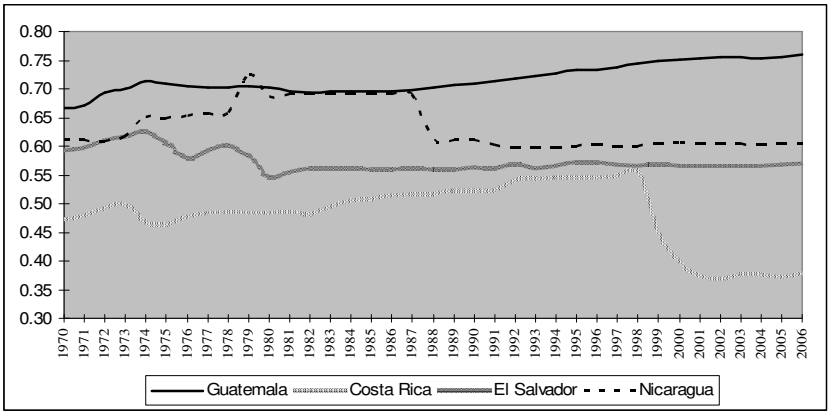
of Ecuador or Bolivia). The evolution over time of their respective coefficients shows a downward trend in the cases of Ecuador and Colombia, and stagnant coefficient for Bolivia (Figure 5).

Figure 5: Ecuador, Bolivia and Colombia. Evolution of state space coefficient for the regression of manufacturing on non-manufacturing sectors of the economy. 1970-2006.



For their part, with the exception of Guatemala, the cases of Central America countries also show a process of decline of importance or stagnation in the importance of the manufacturing sector to act as the leading sector of overall economic growth. This may be explained by the fact that most their manufacturing production takes place within the realm of free trade zones which have weak linkages with the rest of the economy (Figure 6).

Figure 6: Guatemala. Costa Rica, El Salvador and Nicaragua. Evolution of state space coefficient for the regression of manufacturing on non-manufacturing sectors of the economy. 1970-2006.



c) Disaggregated analysis of the Services Sector

In view of the evident importance of service sector growth on economy-wide output, the same methodology was applied to the data for the sub-sectors of services, with similar results (Table 10).

Table 10: Dynamic Panel - Service Sector Subdivisions

	GNOCOM	GNOTRANS	GNOFIN	GNOSOC
GCOM	0.4366			
	28.6607			
GNOCOM(-1)	0.0473			
	1.4526			
GTRANS		0.3061		
		9.2858		
GNOTRANS(-1)		0.1951		
		5.7028		
GFIN			0.4619	
			127.2774	
GNOFIN(-1)			0.0863	
			16.8995	
GSOC				0.3158
				4.4175
GNOSOC(-1)				0.1727
				10.8110
DUMMY	-0.8211	-0.7874	-0.6135	-0.6492
	-3.6489	-1.3395	-13.8290	-1.8332
Wald test (ß=0)	821.4	86.22	1699.5	19.51
Sargan test-p value	0.49	0.40	0.54	0.29
Cointegration test	269.1	341.9	247.5	252.2
Elasticity	0.44	0.45	0.51	0.29
N. obs	859	844	753	844
Sample	1952-2004	1952-2005	1952-2006	1952-2006

The analysis at the country level using state space techniques to determine the importance of the disaggregated services sectors reinforces the results produced previously (Table 11). Indeed, the estimated elasticities are generally speaking considerably higher than in the case of the dynamic panel estimates. There are a wide variety of results according to country, but particularly notable is the divergence in results with public, social and personal services sector. Here it has to be borne in

mind that we are talking about growth rates of the individual sectors. So differences between countries may reflect not only efficiency in public expenditures but also the *level* of public expenditure.

Table 11 Latin America				
Results of commercial, transport, financial and social services				
(1950-2006)				
Countries	Final State Space coefficients			
	Commercial	Transport	Financial	SOC
Argentina	0.59(16.9)	0.86(15.50)	0.63 (5.56)	1.56 (7.65)
Bolivia	0.09(1.56)	0.21 (4.50)	0.12 (1.50)	-0.08 (-1.24)
Brasil	….	….	….	….
Chile	0.49(8.95)	0.65(12.45)	0.30(3.98)	1.01 (5.72)
Colombia	0.65(13.33)	0.63(13.34)	0.67(12.13)	-0.28 (-2.50)
Ecuador	0.69(6.58)	0.63(7.38)	0.53(5.64)	0.53 (3.98)
Paraguay	0.13(1.76)	0.11(1.93)	0.08(0.33)	0.03(0.35)
Peru	0.40(3.05)	0.43(2.68)	0.40(0.73)	0.83(5.25)
Uruguay	0.24(4.73)	0.51(8.41)	0.06(0.37)	-0.56(-5.5)
Venezuela	0.49(9.84)	0.56(7.80)	0.66(7.35)	0.59(6.87)
Costa Rica	…	…	…	…
El Salvador	0.16(2.28)	0.62(12.98)	0.52(3.98)	0.06 (0.58)
Guatemala	0.42(6.89)	-0.10 (-2.64)	-0.09 (-1.46)	0.13 (1.61)
Honduras	0.50(5.86)	0.66(7.46)	0.50(5.59)	0.35(4.83)
Nicaragua	0.64(11.67)	0.42(5.87)	0.77(8.03)	0.90(8.12)
Panamá	0.57(8.93)	0.09(2.75)	0.55(6.89)	0.66(5.17)
Dominican Republic	0.55(12.52)	0.55(11.47)	0.73(5.20)	0.70(5.31)
México	-0.11(-1.99)	0.64(12.70)	0.79(7.59)	1.01(14.16)
Note: Z-statistics in parenthesis				

4. Conclusions

The aims of this paper have been modest – to trace empirical regularities in the patterns of growth in Latin America and identify the 'leading sectors' over the long run. Although originally postulated in the context of the industrial economies, Kaldor's first growth law provide a useful framework for carrying this out. Our country-level analysis shows that there is a surprising amount of homogeneity between countries in the estimated growth elasticities. Evidently, there is no pre-determined path to structural transformation and growth. But the empirical regularities are strong enough as to be able to make draw some broad conclusions. At odds with recent research by Wells and Thirlwall (2003), who test the applicability of Kaldor's growth laws for African countries, our findings find only mixed evidence in support of Kaldor's first law in Latin America – that is, that manufacturing is *the* major leading sector of growth.

In the final resort, our estimated elasticities of sectoral growth reflect the degree of articulation of an economy – that is, to Hirschman's well-known phrase, the strength of *forward and backward linkages* between sectors. For the more advanced economies of the region (e.g. Mexico, Argentina), the estimated elasticities are generally considerably higher than in the case of the poorer countries of the region, such as Honduras or Bolivia. Ongoing research into this question hopes to shed more light on these inter-country differences.

Of course, the association between growth of particular sectors and rising income tells us very little about the factors causing the rise in income itself. What the analysis does indicate is the pattern of resource allocation that normally accompanies a rise in income. As pointed out by Chenery (1960), growth is likely to be accelerated by anticipating desirable changes in resource use and retarded by institutional arrangements or government policies that inhibit such changes. This suggests that, despite the contemporary penchant for dismissing industrial policy out-of-hand, in the final resort governments may be 'doomed to choose' (Hausmann and Rodrik, 2006).[16] As Hausmann and Rodrik put it,

[16] The title of the Rodrik Haussman paper is a play on words of the famous book of Milton Freidman, "Free to Choose".

> *"Industrial policy conceived as the provision of inputs that are specific to subsets of activities is not a choice; it is an imperative. The idea that the government can disengage from specific policies and just focus on providing broad-based support to all activities in a sector neutral way is an illusion based on the disregard for the specificity and complexity of the requisite publicly provided inputs or capabilities*." (Hausmann and Rodrik, 2006: 24).

While the present analysis has focused on the similarities in the pattern of growth, it has also revealed the substantial variation that exists and the need to separate particular from universal factors. As Chenery (1960:651) concluded a long time ago, an analysis of the part played by comparative advantage and other particular factors in a given country must therefore be added to knowledge of general growth patterns to arrive at the best allocation of resources.

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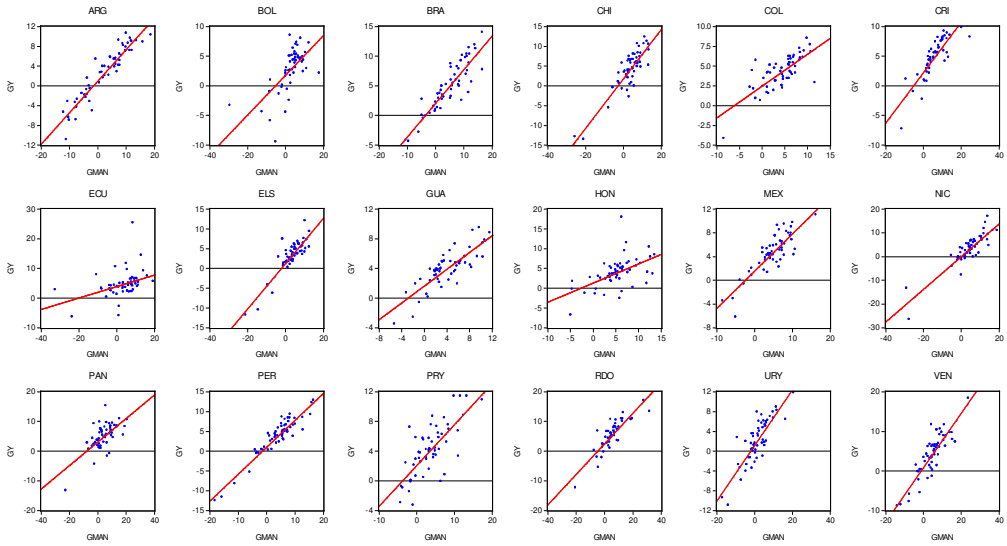
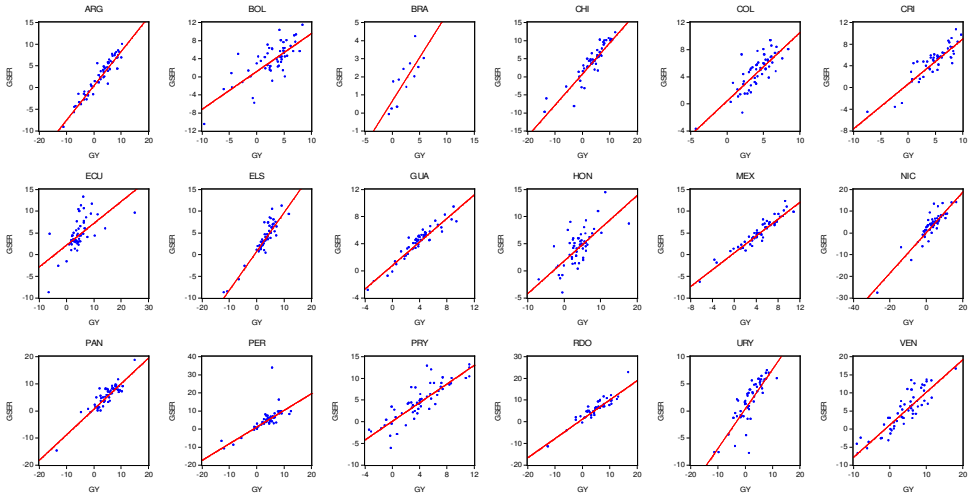
Annex

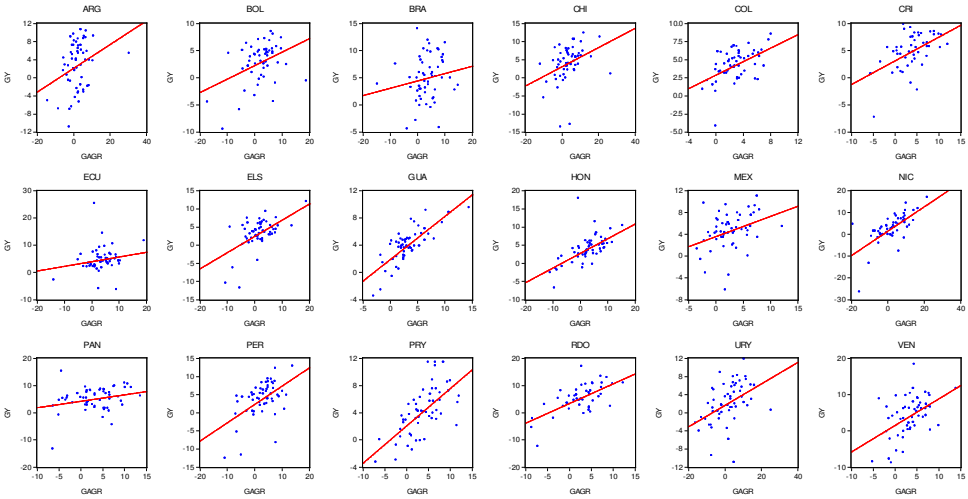
Annex Figure 1: Simple Plot of Manufacturing Growth on Economic Growth, 1950-2006



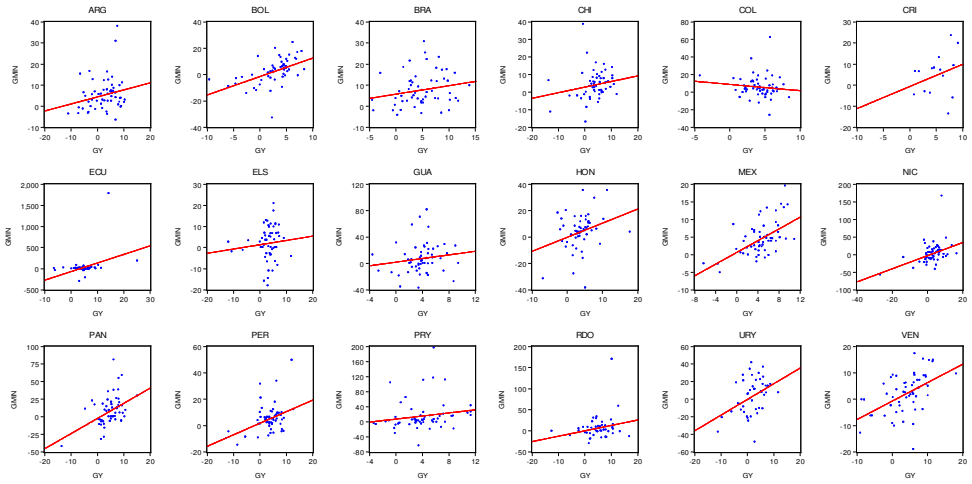
Annex Figure 2: Simple Plot of Services Growth and Economic Growth, 1950-2006



Annex Figure 3: Simple Plot of Agricultural Growth and Economic Growth, 1950-2006



Annex Figure 4: Simple Plot of Mining growth and Economic Growth, 1950-2006



Source: Own Elaboration, from ECLAC data