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# INDUSTRIALIZATION AND REGIONAL DIVISION OF LABOUR

## ANALYSIS OF PATTERNS OF CHANGE IN COLOMBIA 1945-1980

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## 1. Introduction

The purpose of the analysis carried out in this paper is to examine the effects of the process of industrialization on the pattern of regional differential development in Colombia.

Over the last sixty years or so, Colombian industrialization went through various different processes of industrial growth. The first stage of import substitution was more or less completed in the nineteen fifties. The production of consumber durables and intermediate products were the main sources of output growth in the sixties. The opening up of the economy to foreign investment and firms played an important role in this respect. At the end of the sixties and in the seventies a number of impulses were given to stimulate a drive for export so as to revive again the industrialization process, first from a sheltered home base, later - after 1975 - under neo-liberal policies.

The analysis of the pattern of regional industrial development takes the above changes in the industrialization process into account, through the following periodization: (a) 1945-1958[1]; (b) 1958-1967, and (c) 1967-1980. The analysis is based on the census of manufacturing industry available for each of the indicated years.[2] The method used to analize the regional differential participation in the industrialization process is

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(1) Systematically collected data is only available from 1945 onwards.

(2) Because of a different sectoral classification in 1945 as well as changes in geographyical coverage and changes in political administrative divisions over the years, a number of regroupings were necessary so as to come up with comparable series. These are summarised in Appendix 1.

shift and share analysis. The difference in the performance over a period of time by a region and that of the national average (net shift) is decomposed into two. Firstly, the industrial mix effect, which refers to that part of the net shift that is attributable to existing differences in industrial structure. The second component, the regional share effect, denotes differences between regional and national sector growth rates.(3) In the second part of this paper, the industrial export base is estimated for each region and for the indicated years. The degree of dependence on exports and sectoral composition of these exports are evaluated so as to come to a further assessment of the pattern of differential regional development.

In section 2 the results of the shift and share analysis are presented together with a brief description of the industrialization process. In section 3 the regional export base is analysed and its results are discussed with reference to theoretical propositions on regional industrial growth.

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(3) See appendix 2 for mathematical formulation and data preparation.

## 2. Regional participation in the Industrialization Process

Early industrialization in Colombia effectively started after the "War of Thousand Days" (1899-1902). This civil war centered around the decentralization issue (federalism versus centralism), and was settled in favour of a centralized system of government. The war marked, in a way, the beginning of the process of political integration of the Colombian nation state, which was a necessary condition to bring about the economic integration of the country.(4)

The early industrialization meant a gradual move away from the agrarian export economy which had slowly developed itself in the 19th century, first in tobacco and quinine and later more firmly on coffee. In the first decade of the present century coffee became to constitute around one third of total Colombian exports. Partly due to the changing world market for coffee in favour of the fast growing post-WWI US economy, Colombian coffee exports rose rapidly to constitute around 70 per cent of total Colombian exports in the 1920's. This share went down during the great depression only to recover its importance immediately after WW-II.

Without doubt it was the growth of coffee production and exports that in various ways enabled industrialization to take place. First of all, the structure of coffee production was much less concentrated than in the other agricultural

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(4) C.F. Helmsing B, 1983, Agricultura, Industria y Desarrollo de Regiones, Revista Interamericana de Planificacion 17, 66, pp 91-117

sectors, generating a more favourable distribution of (monetary) income, and thus constituted an important source of demand for manufactured products. Secondly, the growing coffee exports generated the foreign exchange necessary to finance the imports of industrial machinery and raw materials. To this, one may add as a third point, that coffee exports stimulated the creation of transport infrastructure, which enabled the physical entry and movement of industrial equipment. During particularly the 1920's great advances were made in the expansion of the various railway networks in the country. Finally, the emergence of the industrial bourgeoise is related though not exclusively with the development of coffee production and trade.

In addition to coffee, several other factors should be kept in mind which enabled the establishment and consolidation (as from 1930) of the industrial sector. First of all the temporal interruption of foreign competition, particularly during the first and second world war, and during the great depression when protective measures, made necessary because of the reduced capacity to import, created a similar effect. A further factor of importance has been the import of foreign loans and capital during particularly the 1920s, with which the public works in transport were partly financed. Foreign (US) capital concentrated particularly in oil extraction.

The main branches of manufacturing activities were food, beverages, textiles and clothing, complemented with other basic consumer good production. It was estimated that these branches increased their share in industrial employment from 40 per cent in 1925 to 56 per cent in 1945. The

development of the sector as a whole was largely based on internal final demand and continued to rely heavily on the imports of intermediate and capital goods. Domestic production of intermediate products only started to develop at the end of the period, whereas capital goods production was insignificant.

Initially, it developed as small scale competitive industry, with only a gradual increase in size of the firms. Nevertheless there was a clear tendency of formation of oligopolistic structures, first on a regional and later on a national scale, particularly in textiles, beer and some food products like for instance chocolate and tobacco. Periods of reduction of competitive imports, marked great spurts in the process of oligopoly formation by means of absorption of competing firms, followed by periods of incorporation of new technical progress leading to larger size of plants, which in its turn led to a further consolidation of these market structures.

Industrialization was not a generalized phenomenon. In the first three decades it basically developed in the Caldas/Antioquia coffee region (Medellin, and to some extent in Pereira and Manizales), in the eastern coffee region, Cundinamarca(Bogota) and in part cities like Barranquilla and Cartagena. By 1945 the four departments concerned, concentrated approx. 70 per cent of the industrial labour force and 76 per cent of total manufacturing output.

The change from the period of early industrialization to the next was marked by a spectacular investment boom immediately after the second World War (1945-50), during which annual growth rates were achieved in the order of 11 per cent. The period

1950-1968 is one in which the nature of industrialization underwent various and fundamental changes. Its pattern followed very closely the import substitution model. Periods of booms and recession follow each other in function of the import capacity of the exports (coffee).

Government responded to balance of payments problems with new protectionist measures, which stimulated the emergence of new sectors. It is particularly this feature of recurrent and in many respects systematic government intervention which marked an important difference with the previous period.

Whereas in the beginning of the period the traditional industries showed marked rates of growth and continued to employ the majority of the industrial workers, the growth of manufacturing industry was achieved more and more by the emergence and expansion of new sectors producing consumerdurables, intermediate and capital goods, such that import substitution was extended further into new products but on a more and more narrow market of domestic demand.

1945-1958

In the first period considered here, 1945-1958, the sectors that experienced the highest rates of growth were paper, oil refining, rubber, other manufacturing and tobacco. It is interesting to note also that the largest two industrial sectors, food and textiles, which had already established themselves firmly in the period of early industrialization experienced relatively minor rates of growth.

In tables 1 and 2 the results of the shift and share analysis are presented. In column three of table 1 the expected output refers to the level of regional output that would have resulted if all regions would have grown at the same (national) rate. In other words it denotes the situation in which no further regional differentiation would have occurred. The net shift is then the difference between the actual and expected output. In column five the positive and negative net shifts are summed and each observation is expressed as a percentage of its corresponding total. The sixth column refers to the comparative shift which expresses the net shift as a percentage of expected output, and as such gives an indication of the regional importance of the observed change.

The regional pattern of output growth in this period reveals some very clear changes. Whereas industry in Antioquia, the 'oldest' industrial area, grows slightly below the national average, Cali (Valle) becomes firmly established as the third industrial center. The extraordinary growth of output in Cali can to a large extent be explained by the expansion of the Buena Ventura harbour at the pacific coast which made Cali an attractive location as a transhipment point, such at the cost of Barranquilla (Atlantico) which as a consequence fell behind. A second important reason is found in the development of agro-processing, particularly sugar refining. Valle together with the capital city region Cundinamarca contained almost the entire positive shift.

There were significant processes of concentration going on in favour of the 'established' industrial regions, but within the latter a reallocation took place away from Barranquilla (Atlantico) and towards Cali (Valle).

Table 1 : Regional industrial output and growth in Colombia: 1945-1958

| Region | Actual Output* 1945 | Actual Output* 1958 | Expected Output* | Net shift + or - | Relative Distribution | Comparative Shift | Annual Growth |
|---|---|---|---|---|---|---|---|
| Antioquia | 36475. | 801884. | 815342. | -13458. | -5.3 | -1.7 | 26.8 |
| Atlantico | 18882. | 292570. | 422078. | -129508. | -51.2 | -30.7 | 23.5 |
| Bolivar | 4759. | 93569. | 106380. | -12811. | -5.1 | -12.0 | 25.8 |
| Boyaca | 3173. | 74124. | 70927. | 3197. | 1.3 | 4.5 | 27.4 |
| Caldas | 8693. | 168280. | 194318. | -26038. | -10.3 | -13.4 | 25.6 |
| Cauca | 1564. | 22738. | 34961. | -12223. | -4.8 | -35.0 | 22.9 |
| Cundin'ca | 36601. | 875945. | 818158. | 57787. | 22.8 | 7.1 | 27.7 |
| Huila | 506. | 11864. | 11311. | 553. | 0.2 | 4.9 | 27.5 |
| Magdalena | 1326. | 20051. | 29641. | -9590 | -3.8 | -32.4 | 23.2 |
| Narino | 970. | 18202. | 21683. | -3481. | -1.4 | -16.1 | 25.3 |
| Norte Sant | 1623. | 29674. | 36280. | -6606. | -2.6 | -18.2 | 25.0 |
| Santander | 7665. | 172464. | 171339. | 1125. | 0.4 | 0.7 | 27.1 |
| Tolima | 3916. | 48143. | 87536. | -39393. | -15.6 | -45.0 | 21.3 |
| Valle | 18242. | 598216. | 407771. | 190445. | 75.2 | 46.7 | 30.8 |
| Total | 144395. | 3227724. | 3227724. | 0. | | | 27.0 |

*$(x\ 10^3)$ current Col pesos.

This regional restructuring of output growth is also clearly reflected in the decomposition of the net shift of each region in table 2.

Table 2: Decomposition of relative output change, 1945-1958

| Region | Net Shift | Mix Component | Regional Share |
|---|---|---|---|
| Antioquia | -13458. | -101265. | 87808. |
| Atlantico | -129508. | -30097. | -99411. |
| Bolivar | -12811. | -8390. | -4421. |
| Boyaca | 3197. | -2502. | 5699. |
| Caldas | -26038. | -23245. | -2794. |
| Cauca | -12223. | 3216. | -15439. |
| Cundin'ca | 57787. | -73858. | 131644. |
| Huila | 553. | -1914. | 2467. |
| Magdalena | -9590. | -2306. | -7284. |
| Narino | -3481. | -2267. | -1214. |
| Norte San | -6606. | -4461. | -2145. |
| Santander | 1125. | 240866. | -239742. |
| Tolima | -39393. | -715. | -38679. |
| Valle | 190445. | 6936. | 183509. |

Only in the case of the Valle department the mix and share effect are positive. In other words not only had this department a favourable sectoral composition or mix (proportionally more of fast growing sectors) but these did grow faster as well. The different continuation of mix and share effects can be summarised as follows:

| Mix \ Share | + | - |
|---|---|---|
| + | Valle | Santander<br>Cauca |
| - | Antioquia<br>Cundinamarca<br>Huila<br>Boyaca | Atlantico - Bolivar<br>Caldas - Tolima<br>Magdalena - Nariño<br>Norte Santander |

Note: Negation net shifts are underlined.

Peripheral regions such as Nariño, Norte Santander, Tolima and Magdalena have not only a relatively unfavourable industrial structure, but these performed also worse than elsewhere. The same also applies to regions that do not have a clear peripheral status such as Bolivar, and Viejo Caldas. On Atlantico we have already commented. Of the remaining departments perhaps the most noteworthy is Antioquia which experienced a small negative net shift.

Given the fact that the period concerned is one of industrial protection from foreign imports, one could interpret the relative inter-regional changes as in a zero sum context. That is to say, that there is a direct relation between the high growth of the central industrial regions and the relatively poor industrial growth performance in the periphery.

1958-1967

Whereas early industrialization was largely undertaken and controlled by Colombian groups, in this period, particularly from 1961 onwards, foreign investment and multi-national firms became more important. The basically open attitude towards foreign enterprise

was related to the fact that now Colombian industrial expansion was heavily based on development of intermediate goods, consumer durables and some capital goods production and to this foreign enterprise can be clearly associated. The fastest growing sectors were Furnitures, Metal Products, Non-electrical machinery and Electrical machinery and appliances, Rubber and Oil and oil derivates. Basic consumer goods industries clearly fell behind in this period.

Table 3 and 4 summarises the pattern of regional growth in this period.

Within the industrial core of the country the above sectoral pattern reflected itself in a relative minor decline (-4.3) in Antioquia where the slow growth of 'first stage' sectors, most notably textiles, expressed itself in a large negative industrial mix component, and in Cundinamarca, where the growth of 'second stage' sectors (oil and oil derivates, metal products and transport) did not compensate entirely for the relative heavy decline of beverages, tobacco, clothing industries. The third industrial region Valle clearly benefitted from the sectoral expansion in intermediate production that had already started in the previous period. Valle alone accounted for 45 per cent of the positive net shifts in this period.

Only two regions experienced negative mix and share effects, most peripheral regions

Table 3: Regional Industrial Output and Growth in Colombia: 1958-1967

| Region | Actual* Output 1958 | Actual* Output 1967 | Expected* Output | Net Shift + or - | Relative Distribution | Comparative Shift | Actual Change |
|---|---|---|---|---|---|---|---|
| Antioquia | 801884. | 3590703. | 3752202. | -161499. | -26.3 | -4.3 | 18.1 |
| Atlantico | 292570. | 1258480. | 1369003. | -110523. | -18.0 | -8.1 | 17.6 |
| Bolivar | 88633. | 566920. | 414734. | 152186 | 24.8 | 36.7 | 22.9 |
| Boyaca | 74124. | 383258. | 346843. | 36415. | 5.9 | 10.5 | 20.0 |
| V. Caldas | 168280. | 691919. | 787421. | -95502. | -15.6 | -12.1 | 17.0 |
| Cauca | 22738. | 119483. | 106396. | 13087. | 2.1 | 12.3 | 20.2 |
| Cordoba | 4936. | 24438. | 23097. | 1341. | 0.2 | 5.8 | 19.5 |
| Cundin'ca | 875945. | 3908677. | 4098751. | -190074. | -31.0 | -4.6 | 18.1 |
| Huila | 11864. | 57441. | 55514. | 1927. | 0.3 | 3.6 | 19.2 |
| Magdalena | 20051. | 151833. | 93823. | 58010. | 9.5 | 61.8 | 25.2 |
| Meta | 5072. | 56199. | 23733. | 32466. | 5.3 | 136.8 | 30.6 |
| Narino | 18202. | 94164. | 85171. | 8993. | 1.5 | 10.6 | 20.0 |
| Norte San. | 29674 | 135879. | 138852. | -2973. | -0.5 | -2.1 | 18.4 |
| Santander | 172464. | 839426. | 806999. | 32427. | 5.3 | 4.0 | 19.2 |
| Tolima | 48143. | 172114. | 225272. | -53158. | -8.7 | -23.6 | 15.2 |
| Valle | 598216. | 3076071. | 2799192. | 276879. | 45.1 | 9.9 | 20.0 |
| TOTAL | 3232796. | 15127005. | 15127004. | 0. | | | 18.7 |

*(x 10 ) current col. pesos

Table 4: Decomposition of Relative Output Change, 1958-1967

| Region | Net Shift | Mix Component | Regional Share |
|---|---|---|---|
| Antioquia | -161499. | -400898. | 239399. |
| Atlantico | -110523. | 53602. | -164125. |
| Bolivar | 152186. | -34871. | 187056. |
| Boyaca | 36415. | -25447. | 61861. |
| Caldas | -95502. | -29041. | -66462. |
| Cauca | 13087. | -4331. | 17418. |
| Cordoba | 1341. | -1916. | 3257. |
| Cundin'ca | -190074. | 98410. | -288484. |
| Huila | 1927. | -3222. | 5148. |
| Magdalena | 58010. | -6739. | 64749. |
| Meta | 32466. | -1510. | 33975. |
| Narino | 8993. | -6227. | 15220. |
| Norte San | -2973. | -9965. | 6993. |
| Santander | 32427. | 120206. | -87779. |
| Tolima | -53158. | -8799. | -44359. |
| Valle | 276879. | 260747. | 16132. |

| mix \ share | + | - |
|---|---|---|
| + | Valle | Atlantico<br>Cund'ca<br>Santander |
| - | Antioquia Meta<br>Bolivar Boyaca Cauca<br>Cordoba Huila Narino<br>Magd. Norte San. | Caldas<br>Tolima |

notwithstanding this unfavourable industrial structure, managed to expand, some even considerably (e.g. Magdalena and Meta). The considerable expansion of Bolivar should be seen in the context of the political decision to establish the petro-chemical complex in Cartaguna instead of in Santander.

On the whole, it seems reasonable to conclude that regional differentiation was not only less marked than in the previous period, but it took also different directions. Whereas in the previous period regional differentiation tended to be more of a straightforward center-periphery model (with some clear exceptions such as Atlantico-Valle switch), now differentiation is more within industrial core (Antioquia, Cundinamarca, Valle), and within the periphery.

1967-1980

This period was characterised by a clear tendency towards reorientation of the economy. The economic reforms of 1968 aimed at exports as a prime generator of accumulation and growth, and to this end, a structural adjustment of the economy was an imperative. Key elements of the

reforms were (a) a new exchange rate regime was established. The existing system of relatively stable but multiple exchange rates was replaced by a flexible exchange rate. With frequent small devaluations, serious balance of payment problems were avoided. Furthermore some liberalization of imports took place; (b) fiscal incentives for exports were increased; first only for manufacturers but later (1970) also for non-traditional agricultural products (corporate tax reduction certificates; (c) new export oriented institutions were created like the export promotion fund; free trade zones were established in main cities; and, finally, (d) the Andean Pact with its common external tariffs should give additional market leeway.

In 1975 this export model was further consolidated by further import tariff liberalization, increased export and credit facilities.

The growth of industrial production increased up to a real average of 8 per cent in the first five years (1968-1973), to slow down again when the effects of the international recession started to be felt. Manufactured exports had increased from 3.4 per cent of gross industrial production in 1970 to almost 10 per cent in 1974, and declined to 8 per cent in 1978.

Clearly there were considerable differences among the various industrial groupings. Sectors like furniture, leather, clothing and professional equipment for which exports became to constitute more than 20 per cent of their output, still represented a small share, whereas for large sectors such as food and textiles which were the largest exporters, external demand still constituted no more than 10 per cent of total gross output. Furthermore, there was an important element of transnationalization, in so far as it were firms with foreign ownership that played an important

Table 5: Regional Industrial Output and Growth, Colombia, 1967-1980;

| Region | Actual Output 1967* | Actual Output 1980* | Expected Output 1980 | Net Shift + or - | Relative Distribution | Comparative Shift | Actual Annual Growth |
|---|---|---|---|---|---|---|---|
| Antioquia | 3590703. | 76276976. | 79960808. | -3683832. | -15.1 | -4.6 | 26.5 |
| Atlantico | 1258480. | 21060216. | 28024896. | -6964680. | -28.5 | -24.9 | 24.2 |
| Bolivar | 566920. | 20930328. | 12624653. | 8305675. | 34.0 | 65.8 | 32.0 |
| Boyaca | 383258. | 8630374. | 8534713. | 95661. | 0.4 | 1.1 | 27.1 |
| Caldas | 691919. | 16441389. | 15408237. | 1033152. | 4.2 | 6.7 | 27.6 |
| Cauca | 119483. | 2088794. | 2660748. | -571954. | -2.3 | -21.5 | 24.6 |
| Cordoba | 24438. | 506274. | 544206. | -37932. | -0.2 | -7.0 | 26.3 |
| Cundin'ca | 3908677. | 94267728. | 87041720. | 7226008. | 29.6 | 8.3 | 27.7 |
| Huila | 57441. | 1230992. | 1279145. | -48153. | -0.2 | -3.8 | 26.6 |
| Magdalena | 151833. | 2106994. | 3381146. | -1274152. | -5.2 | -37.7 | 22.4 |
| Meta | 56199. | 1222996. | 1251487. | -28491. | -0.1 | -2.3 | 26.7 |
| Narino | 94164. | 1330215. | 2096924. | -766709. | -3.1 | -36.6 | 22.6 |
| Norte San | 135879. | 3264395. | 3025868. | 238527. | 1.0 | 7.9 | 27.7 |
| Santander | 839426. | 26212662. | 18693048. | 7519614. | 30.8 | 40.2 | 30.3 |
| Tolima | 172114. | 3620486. | 3832780. | -212294. | -0.9 | -5.5 | 26.4 |
| Valle | 3076071. | 57670088. | 68500544. | -10830456. | -44.4 | -15.8 | 25.3 |
| Total | 15127005. | 336860928. | 336860928. | 0. | | | 27.0 |

*$(x\ 10^3)$ Current Col. Pesos

role in this seemingly rapid export success.

The four major growth sectors in this period were chemicals, printing and publishing, basic metallurgical and transport industries. In other words the main increase in output originated most importantly in the intermediate and capital goods industries. In contrast, it can be added that the traditionally most important and consumer goods industries stayed relatively behind in growth increases. This sectoral reorientation of the economy, clearly produced a new tendency towards inter-regional differentiation.

Table 5 and 6 summarise these changes. From the first it can be concluded that within the industrial core a 're-centralization' occurred favouring Bogota (Cundinamarca). The Cali region in particular and more than Antioquia relatively stayed behind. In addition it is important to note that during the period of 'export drive', the Barranquilla department (Atlantico) did not benefit. On the contrary, as in the previous periods Atlantico continued to trail behind and was responsible for 28 per cent of the total negative shift.

The trend already discussed in the previous period of 'differentiation within the periphery' continued very clearly in this period. Bolivar and Santander together accounted for 65 per cent of the total positive shift. In both cases it is almost entirely due to their insertion as producer of intermediate resource based output (chemicals, oil and oil derivates). If we summarise the decomposition analysis with the familiar graph, contrasts become quite revealing.

| mix \ share | + | - |
|---|---|---|
| + | Cundinamarca | Boyaca<br>Huila<br>Valle |
| - | Antioquia Meta<br>Bolivar Norte San.<br>Caldas Santander<br>Cordoba | Atlantico Tolimo<br>Cauca<br>Magdalena<br>Narino |

Only Cundinamarca had a favourable industrial structure but also experienced above average sectoral rates of growth. Five departments had opposite characteristics, Cauca, Narino, Magdalena, Tolima and also Cordoba and Meta remained behind and acquired definite peripheral status.

Table 6: Decomposition of relative output change, 1967-1980

| Region | Net Shift | Mix Component | Regional Share |
|---|---|---|---|
| Antioquia | -3683832. | -4197454. | 513625. |
| Atlantico | -6964680. | -1952347. | -5012336. |
| Bolivar | 8305675. | -1518665. | 9824335. |
| Boyaca | 95661. | 2827111. | -2731449. |
| V. Caldas | 1033152. | -1040275. | 2073428. |
| Cauca | -571954. | -258510. | -313444. |
| Cordoba | -37932. | -54886. | 16954. |
| Cundin'ca | 7226008. | 6604916. | 621078. |
| Huila | -48153. | 48424. | -96577. |
| Magdalena | -1274152. | -140162. | -1133989. |
| Meta | -28491. | -41606. | 13115. |
| Narino | -766709. | -40515. | -726194. |
| Norte San. | 238527. | -70898. | 309425. |
| Santander | 7519614. | -1389029. | 8908638. |
| Tolima | -212294. | -195388. | -16906. |
| Valle | -10830456. | 1419255. | -12249718. |

The shift and share analyses conducted over the 1945-80 period appear to support the conclusion that already in the 1945-1958 period (and before) the basis was laid for the industrial dominance of the Bogota region. This position stabilised or weakened a bit during the transitional period, only to be consolidated further in the export orientation period. This in itself is an important finding and its theoretical implications call for attention. Whether the economy was growing on the basis of internal demand or was developing on external sources of growth, the tendency of further concentration in the Bogota region continued, only to be interrumpted during the transitional period.

A second major conclusion is that while in the period of import substitution and (autonomous) development of a protected national market, regional differentiation appeared to be much more a process of generating a regional dualism of an industrializing core and a stagnating periphery. In the later periods the pattern of inter-regional change was much less unilinear and straightforward. The development of resource based production in intermediate goods (oil derivatives, chemicals and agro-processing) seems to have greatly contributed to differentiation within the periphery. The remarkable performance of industries in Bolivar and Santander can be largely explained in this way. Similar but definitely less spectacular cases of industrial revival in Viejo Caldas and Norte Santander may be explained in a similar fashion.

Although it would perhaps have been feasible to decentralise industrial development via foreign investment policy, quite the opposite result came about without such a policy, in the sense that around 75% of foreign investment existing in 1970 was established in the industrial core[5]. Also later attempts in

1975 to stimulate foreign investment outside main industrial core met with only limited results[6].

## 3. Export Base Dependence or Growth

In the analysis of the regional development process considerable attention is given in the literature to the development of the export base. The importance of the export staple to regional economic development was first systematically treated by D. North in his widely known 1955 article[7]. In his view, the long run development of a regional economy depends on the success of its export base. Furthermore, and as 'a region's' income grows, indigenous savings will tend to spill over into new kinds of activities. At first, these activities satisfy local demand, but ultimately some of them will become export industries. . . "As a result of the export base of regions tend to become more diversified . ." (p. 255). Through the diversification of its export base a regional economy will be able to continue its further development.

In contrast to North, Myrdal's cumulative imbalance theory explicitly includes the analysis of the consequences of the failure to develop a viable export base, in relation to its

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(5) Arango, J.A., 1976, Inversion Extranjera en la Industria Manufacturera Colombiana, Boletin Mensual de Estadistica, Nos. 302 and 303, DANE, Bogota.

(6) Jimenez, M. and S. Sideri, 1983, Estado y Vinculaciones Internationales. ISS-Mimeo, Chapter 4.

(7) North, D., 1955, Location Theory and Regional Economic Growth. Journal of Political Economy, 63, p.p. 243-58. Reprinted in Friedman, J. & W. Alonso, Ed. 1964, Regional Development Planning, a Reader, MIT Press Cambridge, Mass.

success in other regions.[8] Myrdal's propositions are somewhat general and difficult to translate into precise statements. Holland however has presented a export led growth and - decline model that incorporates cumulative causation mechanisms so characteristic of Myrdal's theory (income multipliers, acceleration and migration).[9] This revised formulation is not specfic about any resultant specialization patterns. Much in the same sense of arqument of'success breeds success', it is interpreted here in the following way. The center has a growing export sector which increasingly diversifies, while the export base in the periphery stagnates and remains little diversified.

Dependency views show great resemblance to Myrdal, but differ on an essential and important respect. Integration of a peripheral region into the larger (inter) national economy produces not just decline but a fundamental restructuring of its economy.[10] The integration is partial i.e. only some export products are needed, therefore stimulated and grow. Furthermore, export dependence increases, as a consequence of the restructuring. Export growth and general stagnation together constitute regional underdevelopment.

While dependency theory is more elaborate on what happens to the peripheral regions, and less so to its (national) core - as the latter is also an intermediate element in international relations of dependency - domination theory poses a superior structure of the center[11] Not only in size but also composition. The center is diversified and

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(8) Myrdal G, 1957, Economic Theory and Underdeveloped Regions. London, Duckworth & Co.

(9) Holland S, 1976, Capital versus the Regions, London MacMillan

(10) Slater, D. 1975. Underdevelopment & Spatial Inequality approaches to the problem of regional planning in the Third World, Progress in Planning, 4,2, pp.97 — 167.

(11) Hilhorst J.G.M. 1971, Regional Planning, Rotterdam RUP.

less dependent on export, while the periphery depends more on it as a source of growth. Moreover it has an undiversified basis. Vertical trade integration is said to exist, where individual peripheral regions specialise in export of raw materials and imports, and the center produces and exports final products.(11)

These unequal trade structures stand in sharp contrast to the interregional application of neoclassical international trade theory, which points to interregional specialization by both trading partners with mutual gains and growth from it. Since regions are however not self-contained, it is not comparative but absolute advantage that would rule inter-regional trade.

Unfortunately only very rarely data is available on pattern of regional trade,which would allow an assessment of the kind of trade structure and its evolution. The only alternative is to recur to approximations on the basis of estimates of a regions export base. This, of course, also implies that no strong conclusion can be drawn.

One of the most widely adopted methods in regional impact analysis is the use of the location coefficient for the purpose of identifying the export base.(12) The coefficient is defined as follows.

$$Lq_i = \frac{R_i}{R} \Big/ \frac{N_i}{N}$$

where $R_i$, is the regional and $N_i$ the national output of sector i, and, R total regional and N total national output. If $Lq_i > 1$ then sector i is more than proportionally represented in the region. The

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(12) Pleeter S. ed, 1980, Economic Impact Analysis: Methodology and Application, Studies in Applied Regional Science, Vol. 19,Martinus Nijhoff, Boston

region is specialized in this sector and would be able to cater for its internal needs, and export the rest to other regions or abroad. The export component can in this way be taken to be

$$OB_i = \left( \frac{Lq_i - 1}{Lq_i} \right) 0i \quad \text{for } Lq_i \geq 1$$

If $Lq_i < 1$, then the sector concerned would in comparison to the national average, be underrepresented. In such case exports are expected to be absent. $OB_i = 0.0$
Export dependence ($E_R$) can now be defined as follows:

$$E_R = \sum_i OB_i / \sum_i Oi \times 100$$

$$\text{where } OB_i = \left( \frac{Lqi - 1}{Lq_i} \right) O_i \quad \text{for } Lq_i > 1$$

For the purpose of measuring the diversification in export base, the Gibbs-Martin index of trade diversification is used.(13) This index is defined as follows:

$$GM_R = 1 - \frac{\Sigma OB_i^2}{(\Sigma OB_i)^2}$$

Its upper boundary varies with the adopted number of categories (sectors i).(13)

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(13) Hammond R and P.S. McCullagh, 1974. Quantitative Techniques in Geography, Clarendon Press, Oxford

Table 7: Export Base Dependence Colombian Regions, in two series

| | Serie A | | Serie B | | |
|---|---|---|---|---|---|
| | 1945 | 1958 | 1958 | 1967 | 1980 |
| Cundinamarca | 18 | 18 | 19 | 21 | 22 |
| Antioquia | 25 | 32 | 33 | 32 | 30 |
| Valle | 15 | 28 | 29 | 30 | 32 |
| Atlantico | 25 | 18 | 20 | 22 | 25 |
| Bolivar | 33 | 35 | 35 | 53 | 63 |
| Santander | 44 | 59 | 59 | 53 | 63 |
| Cordoba | - | - | 55 | 58 | 59 |
| Magdalena | 40 | 54 | 55 | 61 | 51 |
| Norte Sant. | 32 | 43 | 46 | 54 | 51 |
| Boyaca | 46 | 57 | 64 | 69 | 71 |
| Meta | - | - | 56 | 64 | 73 |
| Caldas | 33 | 39 | 39 | 36 | 24 |
| Tolima | 39 | 48 | 48 | 54 | 40 |
| Huila | 38 | 49 | 51 | 56 | 69 |
| Cauca | 45 | 60 | 60 | 61 | 62 |
| Nariño | 18 | 41 | 41 | 58 | 70 |
| Total | 25 | 29 | 30 | 32 | 34 |

Table 7 gives the industrial export base dependence index for the Colombian departments.(14) A number of conclusions may be drawn from them. First of all, it is interesting to observe that the index gradually increases from 25 per cent in 1945 to 34 per cent in 1980. Integration of the country brought about increased trade, something which in general is consistent with the theories exposed above. Secondly, and comparing the regions, it can be seen that the absolute range of values increased from 27 in 1945 and 42 in 1958 to 51 per cent points in 1980. A clear regional divergence took place in the development of the industrial export base.

The industrialized regions have, as could be expected, in view of the growth of their respective internal market size, lower levels of importance of exports than the other regions. For the industrial region the index did not go down but increased slightly (except for Antioquia). However, in the peripheral regions, the importance of export base grew much more rapidly to levels ranging, from 50 to 70 per cent. With the exceptions of Caldas (coffee region) and Tolima, the specialization index went up consistently. Also the two 'intermediate' regions Bolivar and Santander underwent a similar process.

Particularly interesting is to recall the historical fact that international exports of manufactured products was almost entirely absent during the 1945-1958 period. Thus, changes in export base can be seen entirely in the context of interregional trade and the process of national integration that in its basic form, was completed during this period.(15) All regions except Atlantico experience

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(14) The level of sectoral and regional disaggregation that could be obtained for 1945 was inferior to that of the subsequent years. For this reason two subseries were made where 1958 appears in both.

(15) C.J. Misas G, 1975, Caracteristicas generales de las industrias regionalesen Colombia, Enfoques Colombianos, 4, 1975

a growing importance of these respective export base. From table 1 it could be discerned however that only four regions experienced positive comparative shifts, of which Cundinamarca and Valle stand out. Most peripheral regions experience large (> 10%) negative comparative shifts. In other words, predominantly center regions gained from interregional trade through above average growth.

A third remarkable conclusion is that most regions had a relatively diversified export base in 1945 ($GM_R$ > 0.50). However, during the period the industrial core maintained a high level of diversification (except Antioquia), while peripheral regions experienced a decline, (see table 8). The relation between the two indices is summarized in the following diagramme.

Regional Export Base Dependence and Diversification, Colombian Industry 1945-1958

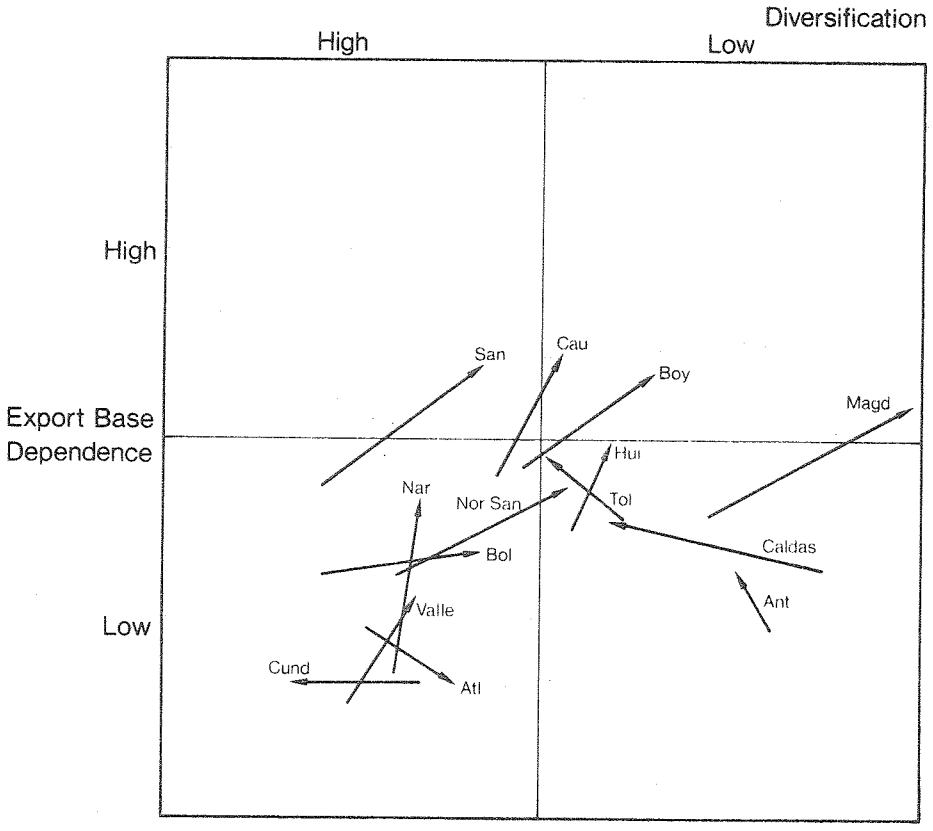
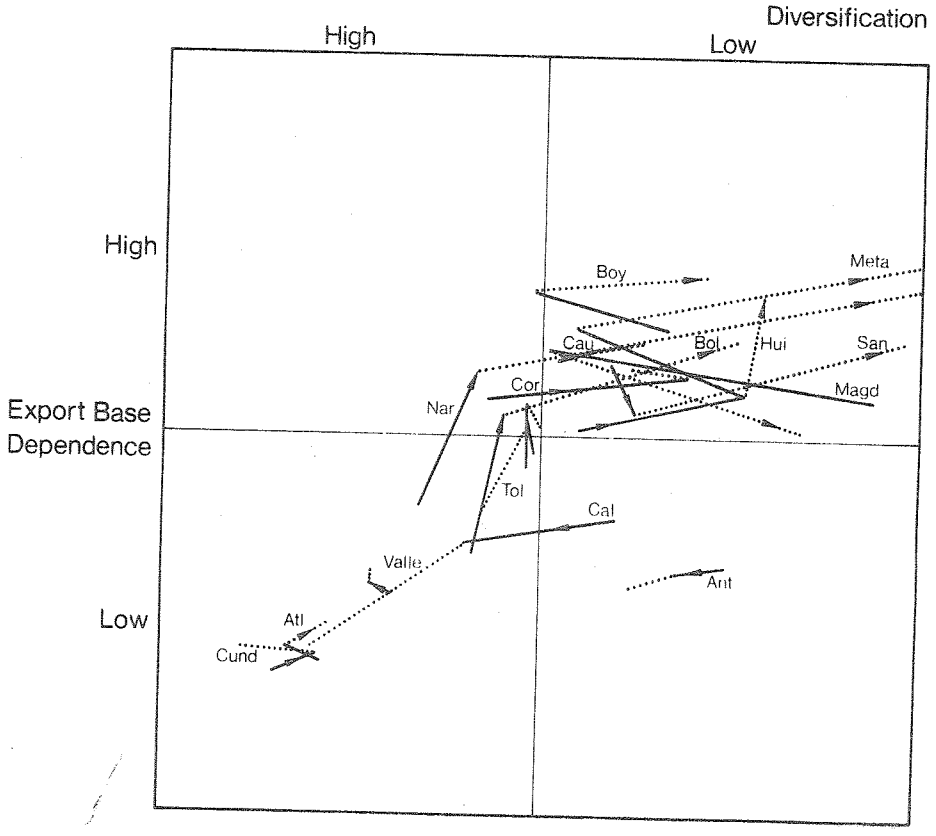


Table 8: Gibbs Martin Index Regional Industrial Export Base Diversification, in two series

| | Serie A | | Serie B | | |
|---|---|---|---|---|---|
| | 1945 | 1958 | 1958 | 1967 | 1980 |
| Cundinamarca | .66 | .83 | .85 | .80 | .89 |
| Antioquia | .20 | .24 | .26 | .32 | .37 |
| Valle | .75 | .67 | .69 | .72 | .72 |
| Atlantico | .73 | .62 | .79 | .83 | .78 |
| Bolivar | .79 | .59 | .59 | .55 | .24 |
| Santander | .79 | .59 | .41 | .38 | .02 |
| Cordoba | - | - | .57 | .31 | .38 |
| Magdalena | .27 | .02 | .07 | .49 | .16 |
| Norte Sant. | .69 | .47 | .52 | .52 | .50 |
| Boyaca | .52 | .36 | .33 | .51 | .29 |
| Meta | - | - | .24 | .45 | .00 |
| Caldas | .13 | .40 | .40 | .60 | .80 |
| Tolima | .39 | .50 | .51 | .52 | .57 |
| Huila | .46 | .41 | .45 | .24 | .21 |
| Cauca | .56 | .48 | .48 | .44 | .27 |
| Nariño | .69 | .66 | .66 | .59 | .01 |
| Total | .86 | .88 | .89 | .90 | .88 |
| | $0 < GM < 0.93$ | | $0 < GM < 0.95$ | | |

The above analysis seems to support the hypothesis that in this period of national market integration, the periphery was negatively affected. Negative shifts, increased export dependence and reduction of diversification all went together. Most peripheral regions became more dependent upon their respective export base, but above all (except Cordoba, Tolima) experienced strong tendencies towards specialization. The peripheral regions as well as the 'intermediate' regions saw their initially diversified export heavily curtailed. In other words, they became more and more "specialist" or rather more industrial export producing regions: more integrated but on an each time narrower basis. The principal difference between the two types of regions is that the former are agro-based producers (food and beverages), where as each of the intermediate regions are specialized in oil refinery and refinery products. From table 5 it can be concluded furthermore that only Bolivar, Santander and Boyaca simultaneously experienced significant positive shifts as well.

Regional Export Base Dependence and Diversification, Colombian Industry, 1958-1967-1980.



Within the industrial core only Cundinamarca scored positively on all three counts, and consolidated herewith its industrial dominance.

The industrial core -with significant internal differences- maintained high levels of export diversification, and particularly Valle and Cundinamarca appear to have gained from it (positive comparative shifts).

The period 1958-1967 of second stage import substitution and large inflow of foreign investment and enterprise, was a kind of intermediate period in which various tendencies occurred simultaneously. Export base dependence increased in all peripheral regions, and in most of them with above average rates of growth of total output. However at the same time, in some peripheral regions the export base diversified, while in others the opposite occurred. A similar internal differentiation was already noted for the industrial core of the country.

The pattern of change in the third period (1967-1980) no doubt was affected by the growing importance of international as against interregional exports. On the basis of our data it is however impossible to isolate interregional from international export base activities. In other words we cannot assess the impact of each separately on the pattern of regional change. As regards the overall pattern of change, three conclusions can be drawn. In the first place, there is a very strong tendency towards specialization (reduction of diversification) in the industrial export base activities in the peripheral regions, as well as an increased dependence on export base activities. Secondly, and with regard to the industrial core regions, no such phenomenon can be observed. Export activities become more diversified (except in

Atlantico) and export dependence only goes up slightly. Thirdly, not all regions within either center or periphery are equally affected by the increased international exposure. Within the industrial core only Cundinamarca experienced a high relative rate of growth, whereas in the periphery particularly Santander and Bolivar, and to a lesser four other departments experienced high rates of growth, while six others stagnated.

It seems reasonable to conclude that in the first period examined, when industrialization almost exclusively took place within the context of the domestic market, the interregional pattern of change was a relatively straightforward case of center periphery polarization (with the exception of Valle). In the later periods the pattern of change was much less uni-linear. Second stage import substituting industrialization and subsequent internatioanlization, each had differential effects upon the various regions, both with the industrial or as well as within the periphery.

Gradually a new interregional industrial division of labour emerged, characterized by an increasingly and more and more narrowly specialized exporting periphery, internally differentiated in an agro-based and a mineral resource based industry, and an industrial core of mutually complementary regions but heavily dominated by an increasingly diversified capital region[16]. Finally it would be interesting to confront our Colombian data with the various theoretical propositions that were briefly enumerated at the beginning

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(16) The number of industrial sectors in which Cundinamarca alone produced more than 50% of the total sector's exports went up from 3 in 1945 to 8 in 1980. Whereas in the periphery, except in Bolivar and Santander, all regions concentrate their respective industrial export base in food and beverages, in the core, each region specialises in a different sector.

of this section. In view of the limitations of our data and the fact that we limit ourselves to manufacturing industry, only very preliminary and partial conclusions can be drawn.

The analysis of the Colombian pattern of regional growth raises considerable doubt about the original long term propositions of Douglas North. Increased integration and trade reduced rather than increased diversification of export base activities in peripheral regions. Certainly in the period of a 'closed economy' with only interregional trade in manufactures, it is difficult to maintain this theory, as also the gap between centers and periphery widened. In a similar fashion there are enough indications to reject the neoclassical gains from trade argument. Neither do all regions specialize, nor did specialization necessarily give rise to growth. Those regions that grew most, actually remained highly diversified. Only some heavily specializing regions experienced considerable above average growth (particularly in second and third period), but other equally specializing regions stagnated throughout.

These conclusions may seem to give support -in a negative sense- to Myrdal's cumulative causation theory. Indeed these appear to be quite a number of indications in that direction. Many peripheral regions specialize and stagnate, while the industrial core continues to grow faster (though with some interruptions), and remains highly diversified in its export base activities. However, it is also important to stress the internal differentiation between both center and peripheral regions. It is difficult to explain these with cumulative causation mechanisms only[17].

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[17] This is particularly noteworthy, since all industrial core regions experienced net immigration of population.

The analysis of the Colombian patterns of change seem to give more support to the unequal structures identified by dependency as well as domination theory. Processes of specialization in peripheral regions may induce growth a stagnation, such depending on its relation to the industrial core. The latter had, and consolidated further, its industrial dominance. It is difficult however to explain the differentiation within the industrial core by means of either theory.

Although the proposition of dependency theory that increased international exposure and integration produces further interregional differentiation cannot be disproven, it is perhaps striking to observe as we have seen above, that the greatest interregional differences were produced in the 1945-1958 period in which domestic manufacturing production was protected from international forces of competition.

Annex 1. Data Sources and Preparation

The analysis that follows covers the period 1945-1980. During this period the conventions concerning classification of manufacturing activity changed. Moreover, and as a consequence of new administrative borders, there are changes in regional breakdown. Both require a number of adjustments so as to create comparable (uniform) sets of data. The problem of sector classification is particularly real when use is made of the 1945 census which is not based on the standard industrial classification. In this regard caution should be taken when drawing detailed conclusions. Below these issues will be discussed for each of the three periods to be analyzed.

Period 1945-1958

The 1945 Census data are published by Ospina Vasquez (1955).[1] However, only a sectoral and a regional breakdowns of employment and output are given but not combined ones.

As a consequence it became necessary to estimate these. The problem at hand can be visualized as a matrix with empty cells and a row and column of totals. The problem therefore is to generate a distribution over the individual cells such that its corresponding row and column totals coincide with the given row and column totals. This problem is a familiar one in input-output analysis and the so called "RAS iterative procedure can be utilized to solve it.[2] In appendix 2 this procedure is described.

1/ Ospina Vazquez, 1974, Industria y Proteccion en Colombia, 1810-1930. Ed. Oveja Negra, Medellin (1e edition 1955). Tables pp. 544, 547 and 549.

2/ O'Connor, R. and W. Henry, 1975 Input-Output Analysis and its Applications, Griffin & Co., London

In order to obtain compatible sectoral and regional divisions, the following adjustments were made:

| 1945 Census | | CID 1958 (3) | |
|---|---|---|---|
| 1 + 17 | Almentos + Aceites y Grasas | 20 | Alimentos |
| 3 | Bebidas | 21 | Bebidas |
| 11 | Tabaco | 22 | Tabaco |
| 2 | Textiles | 23 | Textiles |
| 5 | Vestidos | 24 | Vestuario y Calzado |
| 7 | Cuero | 29 | Cuero |
| 10 | Madera | 25 | Madera |
| | | 26 | Muebles |
| 15 | Papel y sus artifactos | 27 | Papel |
| 12 | Artes graficas | 28 | Imprenta y Ediciones |
| 6 | Quimicas y Farmac | 31 | Quimicas |
| 13 | Derivados | 32 | Derivados |
| 14 | Caucho y similares | 30 | Caucho |
| 8 | Minerales no-metalicos | 33 | Minerales no-metalicos |
| | | 34 | Basicos |
| 9 | Basicos, metalicos y maquinaria de transporte | 36 | Maquinaria |
| | | 37 | Maq. electrica |
| | | 38 | Transporte |
| 16 + 4 | Otras industrias + instrumentos de precision | 39 | Diveras |

In total 15 sectors resulted

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3/ CID, 1970, Industria Manufactura Fabril, monografia Estadistica, Universidad Nacional, Bogota

| 1945 Census | | 1958 CID | |
|---|---|---|---|
| 1 | Antioquia | 1 | Antioquia |
| 2 | Atlantico | 2 | Atlantico |
| 3 | Bolivar (Viejo) | (3 | Bolivar |
| | | (7 | Cordoba |
| 4 | Boyaca | 4 | Boyaca |
| 5 | Caldas (Viejo) | 5 | Caldas |
| 6 | Cauca | 6 | Cauca |
| 7 | Cundinamarca | 8 | Cundicamarca |
| 8 | Huila | 9 | Huila |
| 9 | Magdalena (Viejo) | 10 | Magdalena |
| 10 | Narino | 12 | Narino |
| 11 | Norte Santander | 13 | Norte Santander |
| 12 | Santander | 14 | Santander |
| 13 | Tolima | 15 | Tolima |
| 14 | Valle | 16 | Valle |
| Deleted : Intendencias y Comisarias | | Deleted: Meta (11) | |

In total 14 regions resulted.

Period 1958-1967

For this period, for which data from one single source is available, the original sectoral classification into 20 sectors was maintained.

During the period a number of administrative sub-divisions occurred. Viejo Caldas was split up into 3 departments; Cesar was separated from Magdalena; Sucre from Bolivar; and Bogota (Distrito Especial) from Cundinamarca. The 1958 regionalization from the previous period was maintained however, with two changes. Meta was incorporated and Cordoba was separated from Bolivar.

Summarizing, the analysis was carried out on basis of 20 sectors and 16 regions.

Period 1967-1980

The data used for 1980 was taken from the census of Manufacturing Industry.[1] The published material has a three digit classification. A number of adjustments were made to fit the CID classification for 1958 and 1967.

Although a further regional breakdown would have been possible, it was preferred to use the same as in the previous period. The 1980 regional disaggregation was adjusted accordingly.

| CID 1958/1967 | | DANE 1980 | |
|---|---|---|---|
| 20 | Alimentos | 311-312 | Alimentos |
| 21 | Bebidas | 313 | Bebidas |
| 22 | Tabaco | 314 | Tabaco |
| 23 | Textiles | 321 | Textiles |
| 24 | Vestuario y Calzado | 322 | Prendas de Vestir |
| | | 324 | Calzado |
| 29 | Cuero | 323 | Cuero |
| 25 | Madera | 331 | Madera y Productos |
| 26 | Meubles | 332 | Meubles |
| 27 | Papel | 341 | Papel y productos |
| 28 | Imprenta/Ed | 342 | Imprenta y Editoriales |
| 31 | Quimicos | 351 | Quimico |
| | | 352 | Otros quimicos |
| 32 | Derivados | 351 | Refinerias |
| | | 354 | Derivados |
| 30 | Caucho | 355 | Caucho |
| | | 356 | Plasticos |
| 33 | Minerales no metalicos | 361 | Barro, Loza, etc. |
| | | 362 | Vidrio |
| | | 369 | Otros minerales no-met |
| 34 | Basicos | 371 | Industrias basicas |
| | | 372 | Basicos no ferrosos |
| 35 | Metalicos | 381 | Productos Met. no-mag |
| 36 | Maquinaria | 382 | Maquinaria no-elec. |
| 37 | Electricos | 383 | Maq y aparatos elec. |
| 38 | Transporte | 384 | Maq de transporte |
| 39 | Diversas | 385 | Equip prof de medicion |
| | | 390 | Otros |

Annex 2: Shift and Share and RAS method

A technique that is frequently used to analyze regional growth patterns in the so-called shift and share analysis.[4] This technique is essentially one of decomposition, as it compares the growth of a region with that of the nation and decomposes the difference between the two, into two effects:

(a) the mix effects: the difference between growth due to differences in sectoral composition (fast and slow growing sectors), and,

(b) the share effect: the (residual) difference between the growth of a sector in a region and nationally.

$$R - N = M + S$$

whereby R = actual regional output
N = estimated regional output, according to national growth
M = mix effect
S = share effect

The analysis is often carried out in terms of relative changes. This is particularly relevant for predictive purposes. Here, however an analysis in terms of absolute changes is preferred, for reasons that regions in Colombia differ very markedly in (industrial) size. Small absolute changes in the smaller regions would then cause very large percentage shifts. These sort of biases, which could be expected, are now avoided.

The following formulation has been adopted:

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4/ Armstrong H, and Taylor, 1978, Regional Ec. Policy and its Analysis, London, Philip Allan, pp300-308
For a discussion of the relevance of the technique see: Fothergill S. and G. Gudgin, 1979, In Defence of Shift and Share, Urban Studies, 16, 3, pp309-321

$$R^t - R^o \frac{N^t}{N^o} = \left[ \Sigma_i \; R_i^o \left( \frac{N_i^t}{N_i^o} - \frac{N^t}{N^o} \right) + \Sigma_i \; R_i^o \left( \frac{R_i^t}{R_i^o} - \frac{N_i^t}{N_i^o} \right) \right]$$

$R^t$ = total regional output at the end of the period

$R^o$ = same at the start of the period

$N$ = total national output

$R_i$, $N_i$ = regional and national sector i respectively

The changes in the interregional pattern of industrial output change, reveal themselves in the first instance by the distribution of the net shift ( $R^t - R^o \frac{N^t}{N^o}$ ) over the regions. It should be clear that the sum of the net shift of all regions equals zero, therefore the focus here will be on the distributions of the positive and negative shifts respectively over the various regions.

The second feature which is brought forward in this analysis is the composition of the net shift for each region. Are differences in regional growth explained by differences in sectoral composition (mix) or are other factors at work?

RAS procedure

The procedure has the following steps (expressed in employment):
Let matrix A have dimensions of m regions and n sectors then:

$$a_{i,\, n+1} = \sum_j^n a_{ij}$$ total employment region: $i = 1, \ldots m$

$a_{m+1,\,j} = \sum_{i}^{m} aij$ total employment sector: $j = 1 \ldots n$

Let the known values of total employment by region and sector be respectively $R_i$ and $S_j$, then:

$$P_i = \sum_{j}^{n} aij/R_i \qquad \text{for } i = 1, \ldots m$$

$P_i$ is the ratio of the estimated total regional employment over the actual total regional employment. $\langle P \rangle$ is the corresponding column vector.

2. By premultiplying $[A]$ by the diagonalized $\langle \hat{P} \rangle$ vector, each row element is weighted by the corresponding ratio P. A new matrix A emerges $[{}_2A] \quad {}_2A = [\hat{P}]\,[A]$

3. Subsequently each column is summed to give the estimated sectoral totals, and a q ratio is calculated.

$$Q_j = \sum_{i}^{m} {}_2aij/S_j \qquad \text{for } j = 1, \ldots n$$

4. New estimate of total regional employment is made, by multiplying each column element with its corresponding Q ratio. In matrix notation: ${}_3A = [{}_2A]\,[Q]$
The row totals are compared with the actual values and new P ratios are calculated. This brings us back to step 1.

The process is repeated until the stage where none of the P and q ratio vary much from 1. In our case the process was stopped when: $0.999 \leqslant P,Q \leqslant 1{,}001$.

The same procedure is adopted to generate data for 1945 on value added.