

RESEARCH NOTE

HOW INDUSTRIALISED WAS MEXICO BY 1929? A SMALL BUT NECESSARY CORRECTION TO MEXICO'S NATIONAL ACCOUNTS*

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ABSTRACT

The purpose of this work is to correct an error contained in the historical record of Mexico's GDP which has led to underestimate considerably the progress achieved by industrialisation in the Mexican economy before the Great Depression, also distorting its position within the Latin American context. This error consists in the misleading identification of industry with manufacture, ignoring the contribution to Mexican industrial production made by the metallurgical sector. By incorporating the value added from metallurgy to the net output of manufacture the share of industry in GDP grows accordingly, placing Mexico among the most industrialised countries of Latin America by the end of the export era.

Keywords: industrialisation, industry and GDP, Mexico

JEL classification: N66, E01

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RESUMEN

El propósito de este trabajo es corregir un error en el registro histórico de la evolución sectorial del PIB de México que ha llevado a subestimar el grado de industrialización que alcanzó la economía mexicana antes de la Gran Depresión, distorsionando asimismo la posición de este país en el contexto latinoamericano. El error consiste en la identificación errónea de industria con manufactura, ignorando la contribución a la producción industrial realizada por la actividad metalúrgica. Al incorporar el valor agregado de la metalurgia al producto neto de la manufactura, la contribución porcentual de la industria al PIB aumenta en forma significativa, lo que coloca a México entre los países más industrializados de América Latina hacia el final de la era de las exportaciones.

Palabras clave: industrialización, industria y PIB, México

1. INTRODUCTION

In the recent decades, the view of the way in which the first globalisation (1880-1930) impacted the Latin American economies has changed considerably. In contrast with the rather negative portrayals provided by structuralism and dependency theory, the idea that global integration opened up opportunities from which countries could profit according to their own resource endowment and domestic situation (Bulmer-Thomas 1994), or even the notion of «commodity lottery» (Díaz-Alejandro 1988), led to more nuanced approaches to this crucial experience. In the more sophisticated interpretations of Latin American performance during the export era there is place for winners and losers, with internal factors playing a role as important as the one granted to external forces.

However, even in the more optimistic versions of current interpretations, Mexico has been portrayed more as an example of failure than of success on many counts. This literature grants that Mexico's export sector showed larger diversification than most countries' within the region and that its exports grew at a remarkable pace for over 40 years. Nevertheless, it also underlines that in Mexico the export sector remained small, exports per head were modest and, above all, industrial growth was disappointing¹. This picture is confirmed in the more recent—revised—edition (2014) of Victor Bulmer-Thomas' canonical work, which provides more detailed information on

¹ Bulmer-Thomas (1994, pp. 64-70, 439 and *passim*); Bértola and Ocampo (2013, pp. 108-109, 160); Bértola and Williamson (2006, pp. 46-48).

sources and methodology in the appendices. According to this account, by 1913 Mexico's industry would have contributed with barely 12 per cent to GDP, far below Argentina, Chile and even a small, rural country like Guatemala—and its position would have even worsened by 1929². Was Mexico less industrialised than Guatemala, for real?

This perception is at odds with a whole array of research that sustains the idea that Mexico started to industrialise well before ISI policies took hold in Latin America (Cárdenas 1987; Haber 1989; Cerutti 1992). This literature sheds light upon progress made in a variety of industrial branches, from textiles to steel mills, and upon the fact that import substitution had practically been completed in Mexico for non-durable consumer goods by 1929. In fact, a consensus has emerged among these scholars that not only Mexico had made significant steps towards industrialisation before the Great Depression, but that this phenomenon took place as an endogenous outcome of export-led growth (Haber 2006; Salvucci 2006; Kuntz Ficker 2007)³. How to reconcile this view with the apparently sluggish performance summarised above? The answer is rather simple. Conventional national accounts data contain a mistake as a result of which industrial output before 1929—and its share in the nation's GDP—is underestimated. This error consists in the misleading identification of industry with manufacture, ignoring the contribution to Mexican industrial production made by the metallurgical sector⁴. By incorporating the value added from metallurgy to the net output of manufactures the share of industry in GDP grows accordingly, placing Mexico among the most industrialised countries of Latin America by the end of the export era.

Section 1 of this contribution traces the origins of the available data on the sectorial distribution of GDP and shows how we know that metallurgy has been excluded from industrial net output. The second one discusses the reasons why this may have happened and why it is a mistake. In section 3 we estimate the share of the so-called mining output that should be accounted as the value added by metallurgy and incorporated to the industrial sector, and present a new estimate of sectorial GDP that better portrays the actual state of development of the Mexican economy in the early decades of the 20th century. The paper concludes by discussing some implications of these results for the interpretation of Mexico's performance during the first export era and for the comparative analysis of Latin American countries.

² The exact figures for Mexico are 12.3% by 1910 and 11.8 by 1928. Bulmer-Thomas (2014, p. 145 and 206).

³ In a different, but not necessarily opposite line of thought, Gómez Galvarriato and Williamson (2009) suggest that it was in part an outcome of deteriorating terms of trade during the export era.

⁴ I first pointed out the existence of this problem in Kuntz Ficker (2010b).

2. THE AVAILABLE ESTIMATES OF MEXICO'S GDP BY SECTORS, 1895-1945

Let us start by recognising the fragility of Mexico's GDP estimates for the period before 1950 (Riguzzi 2009, p. 350). Figures are scant and there is almost no explanation of the way in which they were constructed. For lack of better data, scholars may find it necessary to use them as rough indicators of Mexico's macroeconomic performance over time. Hence the importance of rectifying the available estimates to the extent of our knowledge for them to provide a truer picture of the structure and characteristics of the Mexican economy at that time.

The organised account of Mexico's national product started only in 1946 with the publication of the first time series of net national income by sectors from 1929 to 1945 (Sáenz 1946)⁵. Later on, Mexico's adherence to the Agreements of the International Monetary Fund led to the establishment of a specialised agency within the Bank of Mexico aimed at generating a system of national accounts, which gave place to the publication of national income estimates for the period 1939-1945 (INEGI 2003, p. 27). It was only in 1960 that an officially promoted publication (Beltrán et al. 1960) aimed at providing long-term series of some macroeconomic indicators, with the purpose of giving «an overview of the accomplishments achieved by the country» thanks to the Mexican revolution (López Mateos 1960, p. xiii). In a chapter titled «National product» a retrospective GDP series starting in 1895 was presented for the first time⁶. As its author explained

The estimates of gross national product, in total and by activities, from 1895 to 1910 and from 1921 to 1938 ... were made ... extrapolating by means of volume indices of production (Pérez López 1960, p. 574).

This rather fragile estimate (what we will call the «Beltrán» series) became one of the two standard sources for Mexico's GDP accounts for the years before 1939, in total as well as by sectors. It is precisely this series (for the years 1895-1938, in constant 1950 prices) the one that appears in the first editions of INEGI's broadly used volumes of historical statistics, and the basis for ECLA's compilation of macroeconomic indicators for Latin

⁵ This series was dismissed after strong criticism by the person in charge of national accounting at the Banco de México (INEGI, Instituto Nacional de Estadística, Geografía e Informática 2003, p. 27).

⁶ Pérez López (1960). The author gives credit to Miguel Flores Márquez for constructing the data. In spite of that, this series is usually referred to by the first author of the compiled book, namely (Beltrán et al. 1960). All historical GDP series available skip the 1910s, the decade in which the Mexican revolution took place.

American countries⁷. It is also the one employed by Bulmer-Thomas in his classic book and by those who rely on it⁸.

A somewhat different series stems from Banco de México (BM) and was built under the direction of Leopoldo Solís⁹. Although in this case there is no explanation as to its origin or method of construction, Reynolds states that this was actually a revision of the former (Beltrán) series¹⁰. In any event, these are the data employed by Solís and, later on, by Enrique Cárdenas on their studies of Mexico's economic development in the 20th century (Solís 1970, pp. 79-81; Cárdenas 1987, pp. 194-195)¹¹.

Generally speaking, those who have used any of these series do not undertake further analysis of the quality and features of the data, the possible biases to be found, or the way in which they were originally built¹². Neither is there usually a comparison between the two sources. For our purposes, Figure 1 presents the differences between them as to the share of mining/oil and manufacturing in total GDP.

As may be observed, for this period of time INEGI follows Beltrán, while Solís follows BM. For the sake of simplicity, we may then speak of INEGI's vs. BM's figures to comment on these differences. First, the share of the mining/oil sector in total GDP is larger for INEGI than for BM in 1895, 1910 and 1929, and smaller in 1921. This is not the result of a larger share of manufacturing in INEGI's estimates (as compared with those of BM), though, as its participation according to INEGI is also larger in all four benchmark years than that registered by BM. In the case of manufacturing, the difference goes from 1 to 1.6 percentage points, and is of little importance in terms of the issue at stake, which is underestimating the share of industry in total GDP.

⁷ INEGI (1985, I, pp. 311-332); Comisión Económica para América Latina (1978, p. 11). For the years starting in 1939, INEGI uses different base years, apparently relying on Banco de México sources. In more recent editions of this work, the division of GDP by sectors is only included for the period starting in 1950 (See INEGI 2010).

⁸ Bulmer-Thomas (2014, p. 510). He must have used an older edition of INEGI's *Estadísticas históricas*, as those published in 2000 and 2010 do not contain a sectorial breakdown for the years before 1950 (see, for instance INEGI 2010). However, his figure for manufacturing product in 1929 is somewhat below INEGI's figure, as we will see later. Bértola and Williamson (2006), in turn, use Bulmer-Thomas' figures when dealing with Mexico in his chapter on globalisation in Latin America.

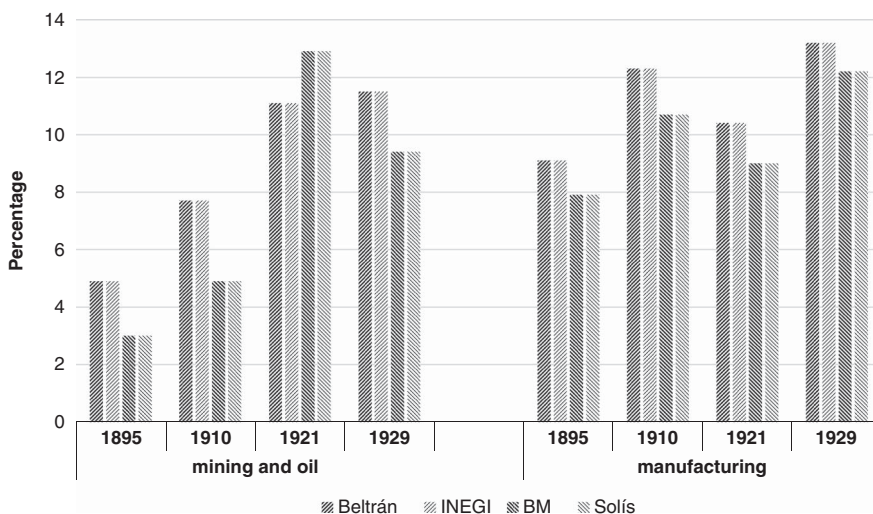
⁹ Banco de México (n.d.). This source has been periodically updated, with changes in the way of presenting the data (See also Banco de México 1991).

¹⁰ Reynolds (1970, p. 342). According to him, the revision was made by Mario Gutiérrez Requenes. Reynolds provides some estimates of his own, very similar in what is of our concern to those of Banco de México.

¹¹ Since the late 1970s, John Coatsworth (1990) published his own estimates of Mexico's GDP for benchmark years, mostly in the 19th century. Two years within our period of interest are included in those estimates (1895 and 1910). Even though he separates mining and manufacture (see table V.5), he is aware of the fact that there is an industrial branch contained within 'mining', as suggested in table V.A.1.

¹² An exception to this is Reynolds (1970, appendix C).

FIGURE 1
SHARE OF MINING/OIL AND MANUFACTURING SECTORS IN MEXICO'S GDP
ACCORDING TO DIFFERENT SOURCES



Let us start from the basic: how do we know that there is such an under-estimation? In the sources where GDP series are provided there is generally no explicit account of the methodology or of the composition of each sector. However, there is plenty of indirect evidence that points to that conclusion.

For a long time it was customary in dealing with the mining-metallurgical sector to call it just «mining»¹³. Aiming perhaps at avoiding confusion, the rest of the industrial sector was usually called «manufacturing», or even «manufacturing industry», a name that excluded metallurgy, a distinctive form of industrial activity¹⁴. In fact, early accounts of industrial development explicitly excluded metallurgy, as the *Memoria* of the first industrial census (1930), states

The Industrial Census embraced mainly manufacturing industries, but some non-manufacturing industries were included, as electricity

¹³ Banco de México went farther by incorporating oil under 'mining', with a simple footnote saying '[mining] includes oil extraction and refining.' Banco de México (1991, tables II-H-2 y 3).

¹⁴ As in Banco de México (1991). INEGI replaced the term 'manufacturing' with 'transformation industries', which appears along with 'extractive' (metallic and non-metallic minerals), 'energy' (oil, coal and electricity), and 'construction' industries, all under a broader group called 'industries'. Only after 1950 the 'extractive' sub-group was broken down into basic metals and intermediate products. INEGI (1985, I, p. 314-327).

plants ... On the other hand, there were industries not included in this Census, as mining and oil ...¹⁵.

Inasmuch as the census became the source to studies on industrial growth, the latter excluded metallurgy from what was considered «industry». For one early example, in the same volume coauthored by Beltrán et al. (1960), a chapter deals with the «capitalisation of national industry, according to census data», in which metallurgy is utterly absent (Fernández Hurtado 1960, p. 616). Almost three decades afterwards, Enrique Cárdenas, in his pioneering work on Mexico's industrialisation before 1929, relied on the same census to estimate industrial value added by branch, and thus left out metallurgy from his account of the industrial sector¹⁶. More recently, Bulmer-Thomas provides us with data on the «structure of manufacturing output» in which the source for Mexico is the very same industrial census, thus excluding metallurgy¹⁷.

On the other hand, there is evidence that even when mining was considered part of industries in the original sources, later on it ended up being reallocated within the primary sector. It all started because although it was implicitly accepted that there was a secondary branch embedded within the «mining» sector, it was hard to separate it from the total «mining» output, as reported from earlier sources. It is for this reason that INEGI chose to include the extractive subsector among «industries» rather than the «primary sector» (Table 1).

As mentioned before, ECLA relied on Beltrán for the years before 1939,—that is to say, the same source as INEGI. However, the criterion by which ECLA decided to «disambiguate» this activity was by renaming the «mining» (or extractive) sector as «mining and quarrying,» thus leaving to the reader the decision as to whether this was a primary or a secondary activity (Comisión Económica para América Latina, 1978, pp. 148-151). Hence while both sources used the same original figures, the results in terms of the contribution to GDP by sectors were quite different, as may be observed in Table 2.

Maybe because «mining and quarrying» did not sound much like an industrial activity, users of ECLA's data decided that it was part of the primary sector, attributing to industry only what in this source appears as

¹⁵ *Memoria* (1932, p. 199). Even though mining was not comprised in the survey, some tables relating to this sector were included at the end of one of the volumes (See Secretaría de la Economía Nacional 1933, tables XXIX–XXXIII). The next industrial census (carried out in 1935) did include 'extractive industries'.

¹⁶ Cárdenas (1987, p. 116), presents the composition of industrial value added by industrial branch. Oddly enough, among intermediate goods are iron and steel, but not the products of metallurgy.

¹⁷ Bulmer-Thomas (2014, p. 146, table 5.4). As in Cárdenas (1987), here metals refer to iron and steel.

TABLE 1
GDP BY ACTIVITIES ACCORDING TO INEGI

Primary sector	Agriculture	
	Cattle raising	
	Forest	
	Fishing	
Industries	Extractive	Metallic minerals
		Non-metallic minerals
	Energy	Oil and coal
		Electricity
	Construction	
	Transformation	

Source: INEGI (1985, I, table 9.2).

«manufacturing industry.» This is at least what Bulmer-Thomas did, and it is for this reason that in his indicators of Latin American industrial development by countries Mexico appears below Argentina, Chile, and Guatemala (and barely above El Salvador) by 1913 and also below Uruguay and Brazil by 1928 (Table 3)¹⁸.

On the other hand, INEGI's classification is correct in considering that there was value added in the so-called «extractive» branch of industry (see Table 1). However, it is also inaccurate as it ignores that part of it was composed by the raw material, namely, ores as extracted from the soil, and thus belonged to the primary sector. As a result, industrial output ends up being overestimated if one uses INEGI's summary figures by sector (originally in absolute values) to calculate percentage shares (Table 2). A more precise account of industrial net output would include value added by metallurgy but put aside inputs, comprising, of course, ores.

¹⁸ In fact, Bulmer-Thomas uses both INEGI and ECLA (and even considers Solís to adjust to 1910), but, perhaps following the latter, adopts a restrictive use of 'manufacturing' that leaves aside mining-metallurgy output. Bulmer-Thomas (2014), sources in tables 5.3 (p. 145) and 6.7 (p. 206), and appendix 3 (p. 510). A different criterion was applied by the same author in his work on Central America, in which industrial net output consisted of mining, food-processing, drinks, tobacco products and other manufacturing industries. See Bulmer-Thomas (1987, p. 299, Methodological appendix).

TABLE 2
GDP BY SECTORS ACCORDING TO INEGI AND ECLA (PERCENTAGE UPON
TOTAL GDP)

	1900	1921	1930
INEGI			
Primary	26	26	20
Industrial	16	23	24
ECLA			
Agriculture, silviculture, hunt and fish	Na	24	19
Mining and quarrying	Na	11	8
Manufacturing industry	Na	10	14

Note: percentage shares calculated from absolute values provided by the sources. Na: not available.
Sources: INEGI (1985, I, p. 334); CEPAL (1978, pp. 148-149).

3. WHY WAS METALLURGY EXCLUDED FROM THE INDUSTRIAL SECTOR?

There are several reasons why the metallurgical value added may have been excluded from industrial output in early estimates of Mexico's GDP by sectors. Three of them come to mind.

First, because it was not considered an industry. Before 1929 Mexican metallurgy did not usually produce finished articles but rather performed the basic process of smelting and refining ore minerals in order to obtain concentrates or metal bullion. This might be the reason why it was considered part of the extraction process, a primary activity in itself. However, this would be a rather misleading way to look at the difference between extraction and processing, between ores and basic metal products, one that would neglect the dramatic change that represented the introduction of smelting and refining plants into Mexico's industrial landscape.

The metallurgical industry reached considerable proportions between its establishment in the early 1890s and the eve of the Mexican revolution (1910). By then three plants owned by ASARCO provided 1.3 million tons in annual smelting capacity (Mexican Yearbook 1911, p. 210); another one, owned by the Guggenheims and considered at the time «the larger custom smelter in North America», added another 500 thousand tons. All together, the more than four dozen plants operating in Mexico had a total smelting capacity of 6.5 million tons

TABLE 3
 MANUFACTURING OUTPUT IN SELECTED LATIN
 AMERICAN COUNTRIES, ACCORDING TO
 BULMER-THOMAS (SHARE OF GDP)

	ca. 1913	1928
Argentina	16.6	19.5
Brazil	12.1 ¹	12.5
Chile	14.5	12.6 ²
Uruguay	Na	15.6 ²
Guatemala	14.2 ¹	Na
El Salvador	10.2 ¹	Na
Mexico	12.3 ¹	11.8

Source: Bulmer-Thomas (2014, p. 145 and 206). Na: not available.

¹1920 for Brazil, Guatemala and El Salvador; 1910 for Mexico.

²1929 for Chile; 1930 for Uruguay.

per year¹⁹. With respect to silver-lead blast furnaces, 45 out of 124 that existed in North America were located in Mexico, for an «annual charge capacity [that] was slightly over 40 per cent of the United States annual total». Even though the Mexican revolution may have halted progress during the 1910s, technological advancement continued during the 1920s as selective flotation was introduced, making of Mexico the second world producer of lead and one of the world's largest producers of zinc (Bernstein 1964, pp. 38-40, 139)²⁰.

In fact, by the end of the export era most of Mexico's «mineral» production and exports had some degree of industrial processing. According to an official source, in 1927 Mexico's total output of mining products (by value) included 5 per cent of raw minerals, 20 per cent of concentrates and 75 per cent of metallurgical products, the latter composed in >90 per cent by gold, silver and lead refined bars, lead mixed bars and copper bars (Anuario 1929, p. 2). As the United Nations' *Standard Industrial Classification* stated in 1949, these products were to be considered part of the «Non-ferrous metal basic industries»²¹.

¹⁹ Estimated by multiplying 18,500 tons/day by 350 days/year (Bernstein 1964, p. 40).

²⁰ According to Bernstein, production of lead more than doubled between 1922 and 1929 practically without the discovery of new mines, that is to say, due to increased productivity in the refining process.

²¹ This group (number 342) was composed by 'Smelting and refining of non-ferrous metals and their manufacture into basic forms such as ingots, bars, billets ...' etc (United Nations Statistical Office 1949, p. 22).

The second possible reason is that the metallurgical industry was (largely) foreign owned. As is well known, there is a difference between GDP and gross national product (GNP) that allows distinguishing between what is produced within the country's boundaries by nationals and foreigners (GDP), and what is produced only by its own citizens, within or outside the nation's boundaries (GNP). The most commonly used indicator is the former, as it allows to measure a country's economic performance, while the latter places the accent upon the performance of its citizens, inside their nation or abroad. Early estimates of Mexico's total output came under the name of «Producto Nacional Bruto», that is to say, GNP (Fernández Hurtado 1960; Pérez López 1960). More than a conscious decision, it seems to be an inaccurate way to label data that aimed at representing Mexico's GDP, as there was no attempt at estimating the contribution of Mexico's citizens abroad. However, it cannot be ignored that these first approaches took place amid an atmosphere of combative nationalism that could have (unconsciously?) led to pay less attention to those activities that were not under direct control of national entrepreneurs and the revolutionary State. In any event, there is no reason whatsoever to dispense with metallurgical net output just because it was mainly foreign owned. In fact, there were some manufacturing industries in which foreign investment was present, although to a lesser extent, and they were still included.

The third reason may be because most of the so-called «mining» product was aimed at foreign markets. Before dealing with it, let us first make a slight amendment to that assessment. At the beginning of the export era practically *all* of the mining output (other than some specie for domestic use) was export oriented. Later on, after the emergence of the metallurgical industry, a large part of the raw material extracted and all of the concentrates produced remained in Mexico for further processing, while most «metallurgical products» (92 per cent in 1927) were sold abroad (*Anuario* 1929, p. 2). In any case, this would not be a valid reason to ignore the contribution of this branch to industry in the computation of GDP.

As obvious as it seems, some confusion emerges as long as the literature on the first export era tends to identify the export sector with the production of primary products and the domestic sector with the place where industry was expected to appear. For one example, while talking about the emergence of a manufacturing sector in Latin America Bulmer-Thomas refers to «domestic industry geared to the home market»²². This does not mean, of course, that he or anybody else considers explicitly that any industrial activity oriented to the external markets should not be included in that country's industrial GDP. It suffices to say that most of Argentina's industrial output by 1929 was composed of articles that were to a large extent for

²² Bulmer-Thomas (2014, p. 197). See also p. 83 and other parts in which domestic demand appears as an important factor boosting—or constraining—industrial growth.

export, like frozen meat and wheat flour, as the same author recalls (Bulmer-Thomas 2014, p. 83, 198). But if «straw hats from Ecuador and Colombia» are to be considered industrial products for export (Bulmer-Thomas 2014, p. 83), why should not be the products of the Mexican metallurgical industry?

4. HOW TO ESTIMATE THE METALLURGICAL SHARE OF MINING OUTPUT?

There is some difficulty at separating metallurgical value added from total «mining» product. Most historical series related to this sector consist of aggregate figures of what in the best of cases is called «mining-metallurgical output»²³. On occasions, export series distinguish between raw material and metal exports, but only for a few products, or for a broader sample of products but just for a few years²⁴. There are only two sources that explicitly differentiate mining output from metallurgical output. The first one comprises the period 1897-1907. According to it, a steady 53 per cent of the total mining-metallurgical output (by value) was composed by metallurgical products within those years (Flores Clair 1985, p. 142). There is reason to believe that industrial value added is underestimated in this account, particularly as we move on in time, as it is unlikely that its share remained stagnant while the smelting industry was growing²⁵. The second source has already been mentioned and provides a detailed account of Mexico's «main mineral and metallurgical products» for the years 1926 and 1927 (*Anuario* 1929). According to it, the value added by the metallurgical industry (including «metallurgical products» but not concentrates) reached 75 per cent of total mining-metallurgical output in 1927²⁶.

If the metallurgical share of «mining-metallurgical» output started at 50 per cent in 1895 and ended up at 75 per cent in 1927, in order to provide an estimate for 1910 the only big assumption that we need to make here is that by then it found itself at some point between the two given figures. As the industry experienced sustained growth before the Mexican revolution it would not be daring to suggest that its share reached 65 per cent of total «mining-metallurgical» output in 1910. Knowing that these are not exact figures but reasonable estimates, we have applied these shares to the data provided by INEGI to recalculate the percentage distribution of GDP by sector. Table 4 presents the results.

²³ González Reyna (1956); *El Colegio* (1960, II, p. 135).

²⁴ See the series for copper and antimony in *El Colegio* (1960, I, pp. 399-432).

²⁵ This underestimation is also detected by the author, as he states that original sources 'acknowledge lack of information' from a list of mining districts. Flores Clair (1985, p. 145).

²⁶ Metallurgical products include bars and bullion of different metals, copper plates and other refined products.

The revised shares in Table 4 give a more precise view of the extent to which structural change had progressed in Mexico within this period. Between 1895 and 1929 the agricultural sector (broadly taken) diminished its size from 33 to 21 per cent of GDP and the extractive stage of mining remained stable, while at the same time industry, in its manufacturing and metallurgy components, grew from 12 to 20 per cent of GDP²⁷.

We may now use these new shares to reassess Mexico's place among the Latin American countries in terms of industrial development, as presented in Table 5.

This table provides a small difference but an entirely different picture. In the first third of the 20th century, Mexico ranked first and compared closely with Argentina in terms of industrial development, followed at some distance by Uruguay, Chile, Guatemala and Brazil²⁸. Moreover, while Chile seems to have experienced a setback between 1913 and 1928 and Brazil a rather modest progress, Mexico and Argentina appeared as the only countries in which the share of industry in GDP was consistently growing during these years²⁹.

5. CONCLUDING REMARKS

It is not easy to tell when Mexico's GDP data by sectors started to include metallurgical products as a part of industrial output. In the 1930s activity in the mining-metallurgical sector declined and, as soon as the economy recovered from the Great Depression, manufactures started to outgrow metallurgy. The combination of these events makes it hard to identify at what point metallurgical value added was taken out from «mining» and incorporated to industrial net output. Starting in 1940 official publications usually considered these activities as part of industrial production, but did not necessarily separate the extractive phase from the industrial value added (Secretaría de la Economía Nacional 1942, p. 546ff). In the late 1940s Mexico received advice on this matter by international organisations and adopted

²⁷ Strictly speaking, the industrial sector should also include a portion of oil output, as the latter consisted not only of crude oil but also, and increasingly so, of some derived products of the oil industry. By 1929 the latter represented 51 per cent of total oil exports. We have not included the value added of the oil industry, however, because it did not exist in 1895 and 1910 and the sector itself was at a rather low point in 1929. However, its value added would increase industrial GDP by an additional one per cent in the latter year (See INEGI 1985, I, p. 313; Kuntz Ficker 2010a, chapter 8 and figure 8.3).

²⁸ About Mexico's primacy in industrial development see Gómez Galvarriato and Williamson (2009).

²⁹ It is still a bit intriguing that, according to these data, Guatemala exhibits such a large industrial sector. On the other hand, figures for Brazil and Chile seem lower than they should be according to the qualitative information available on their economic performance during this period. It would be of interest to inquire whether in these two cases industrial GDP includes metallurgy.

TABLE 4
GDP BY SECTORS, ORIGINAL AND CORRECTED FIGURES (PERCENTAGE SHARES CALCULATED FROM CONSTANT VALUES, 1950 PRICES)

	Original			Revised				
				Primary sector		Industrial sector		
	Agriculture ¹	Mining- metallurgy (extractive)	Manufacturing	Agriculture ¹	Mining	Metallurgy	Manufacturing	Total
1895	33.4	4.9	9.1	33.4	2.4	2.5	9.1	11.6
1910	27.4	7.6	12.3	27.4	2.6	5.0	12.3	17.3
1929	20.7	9.5	13.2	20.7	2.4	7.1	13.2	20.3

Sources: Original data in INEGI (1985, I, pp. 313-319). Revised shares for metallurgy estimated from Flores Clair (1985, p. 142) and *Anuario* (1929, p. 2). For 1910, see text.

¹Includes agriculture, cattle raising, forest, and fishing.

TABLE 5
INDUSTRIAL OUTPUT IN SELECTED LATIN AMERICAN
COUNTRIES, WITH REVISED FIGURES FOR MEXICO
(SHARE OF GDP)

	ca. 1913	1928
Argentina	16.6	19.5
Brazil	12.1 ¹	12.5
Chile	14.5	12.6 ²
Uruguay	Na	15.6 ²
Guatemala	14.2 ¹	Na
El Salvador	10.2 ¹	Na
Mexico	17.3 ¹	20.3

Source: Bulmer-Thomas (2014, p. 145 and 206); new percentages for Mexico according to Table 4. Na: not available.

¹1920 for Brazil, Guatemala and El Salvador; 1910 for Mexico.

²1929 for Chile; 1930 for Uruguay.

United Nations' *Standard Industrial Classification* as soon as it was published (United Nations Statistical Office 1949). Thus it is certain that at least after that year national accounts distinguished correctly between mining and industrial output—the latter including metallurgy.

Mexico's GDP shares by sector presented in Table 4 come as no surprise for those familiar with the way in which the Mexican economy evolved during the export era. This country enjoyed the most diversified export sector within the Latin American region. It embraced products from agriculture, forest, cattle raising, mining and oil activities. Some of them, even in agriculture, experienced some degree of processing before heading for export, and the mining sector generated a large-scale, technologically advanced metallurgical branch. The outcome was an export basket with a significant industrial component, a not so common feature within the Latin American context. In fact, as we have shown here, 75 per cent of Mexico's mineral exports was made of refined metals, the product of basic metallurgy, which contributed with 7 per cent of GDP in 1929. Although the export sector grew at a fast rate between 1870 and 1929, having started at a very low level its size was moderate by the end of the period. Perhaps for this reason, export expansion did not hinder—and most probably promoted—the development of an industrial sector oriented to the domestic market.

By the end of the export era, Mexico held one of the biggest and more diversified industrial plants in Latin America. Domestic industry supplied almost 80 per cent of the apparent consumption of non-durable consumer

goods and 35 per cent of intermediate goods. Its textile industry was larger than that of Argentina and only comparable with Brazil's; its iron and steel industry had no parallel in Latin America. Import substitution industrialisation had made considerable progress before the 1929 Great Depression hit the Mexican economy forcing its shift towards inward-looking growth. That explains why industrialisation advanced so fast amid ISI policies during the late 1930s and in the 1940s.

It is still true that Mexico's industrial development fell short with respect to some Latin American countries in per capita terms (Bulmer-Thomas 2014, p. 145). The reason is to be found in the large share of the Mexican population that lived in the countryside until well into the 20th century. It is also accurate that some of Mexico's industries were in the beginning unprofitable and thus in need of tariff protection (Bulmer-Thomas 2014, p. 147). But those are different matters. In terms of the composition of GDP by sectors Mexico compared favourably with the largest Latin American countries (table 5). Only by incorporating this feature into the analysis we can make sense of the performance of the Mexican economy and formulate fruitful comparisons with other Latin American economies about industrialisation amid export-led growth.

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