

# Oil and economy in Mexico, 1900-1930s

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This brief essay reviews the macro framework of oil and economy in Mexico in the early days of the oil industry, from 1900 to 1938. The first section displays the figures of production at the world level and shows how Mexico became a major oil producer in the 1920s. The second section looks at the Mexican economy of the first third of the century followed by a third section on the importance of the oil sector in terms of trade and fiscal income. The last section reviews the literature and the outlooks of the contemporaries over the development of the oil industry in the early part of the 20<sup>th</sup> century. The paper will be of use for those producing in depth analyses of the Mexican oil industry in this period.

Keywords: first oil boom, government income, export-led growth, Mexico

JEL: N5, Q33

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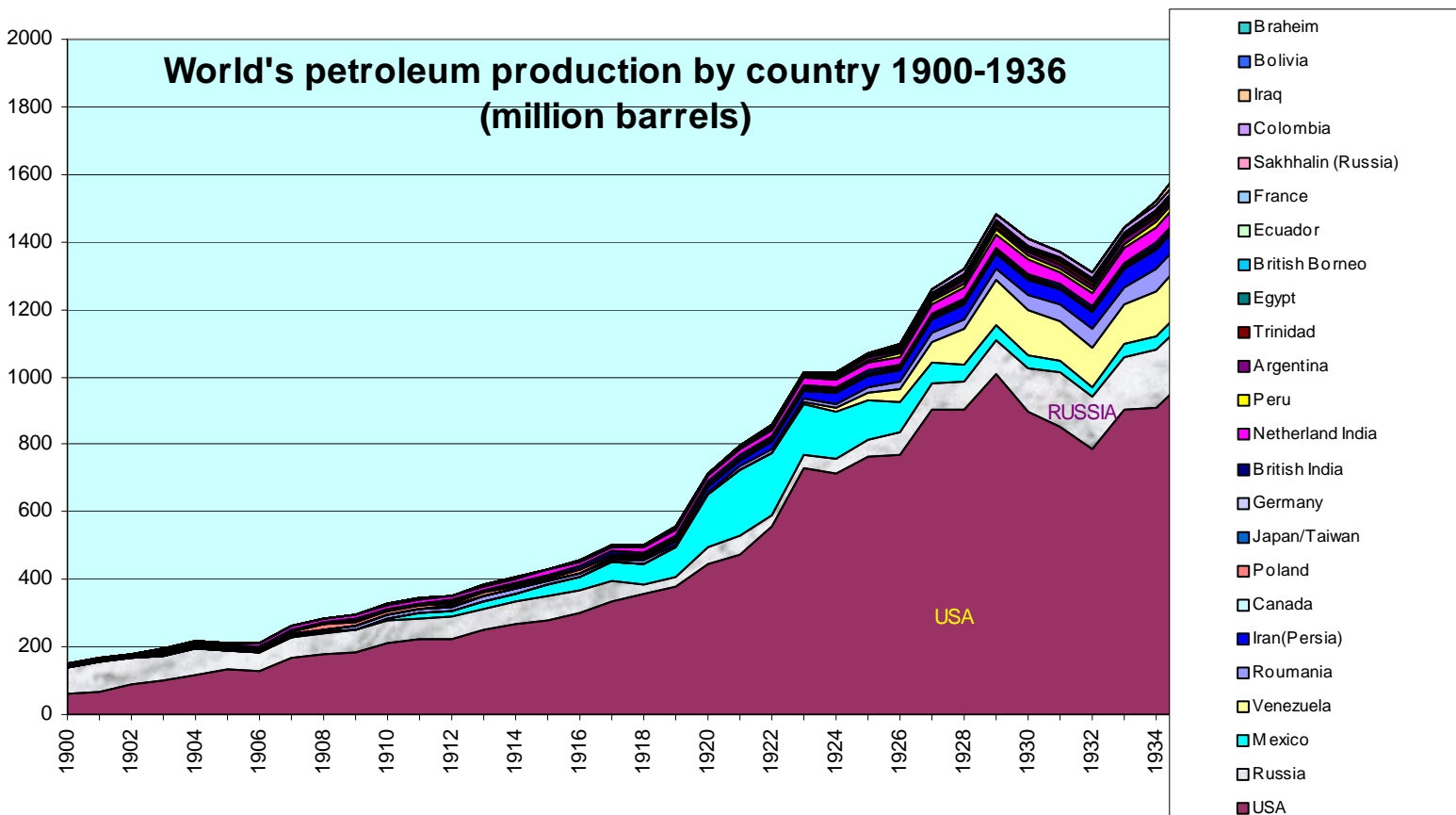
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This brief essay reviews the big picture of oil and economy in Mexico from 1900 to 1938. The first section displays the figures of production at the world level and places Mexico within this framework. The second section look at the Mexican economy of the first quarter of the century followed by a third section on the importance of the oil sector in terms of trade and fiscal income. The last section reviews the view of the contemporaries over the development of the oil industry in this period.

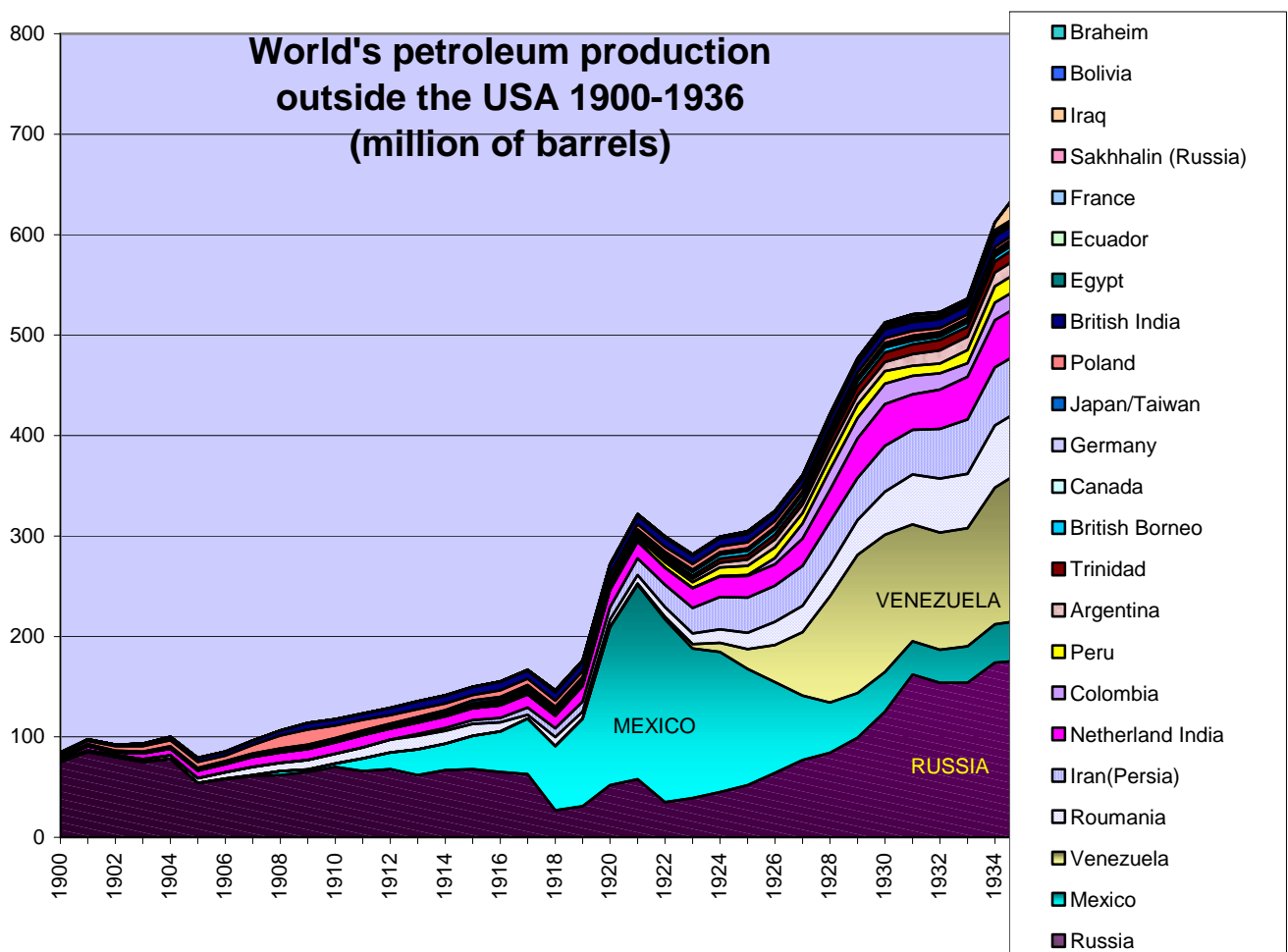
## ***World's oil production at the start of the 20<sup>th</sup> century***

It is considered that the modern oil industry began when the first commercially producing well was drilled in Titusville, Pennsylvania, (United States) in 1859. From the very beginning the United States were to be major players in the world's production and consumption of the new energy.



Sources: Own elaboration with (American Petroleum Institute, 1937) data.

The development of the oil industry in the south of the United States and the similarity of its coastal area to that of northern Mexico attracted world-wide attention in the first two decades of the 20<sup>th</sup> century. Mexico started commercial production in 1901, although it took almost a decade to produce meaningful amounts. Literally hundreds of oil companies were organised to exploit the Mexican subsoil. Nevertheless, an exploration licence was not a guarantee of success: of the 447 companies that existed in Mexico in 1919, only 24 produced in exportable quantities.<sup>1</sup> Within the next decade Mexico became the world's greatest oil exporter and second world's producer. In 1921, at its peak, Mexican oil production accounted for almost a quarter of the world's oil production.<sup>2</sup> The Mexican oil boom coincided with the definitive take-off of the oil industry at world level: Engines used diesel oil more and more often; oil replaced coal in ships and other engines; aeronautics were born; automobiles began to be produced on a large scale.



Sources: Own elaboration using data by (American Petroleum Institute, 1937)

<sup>1</sup> M. Rippey, *Oil and The Mexican Revolution* (Leiden, 1972), pp. 137, fnt.18.

<sup>2</sup> J. Noriega, *Influencia de los hidrocarburos en la industrialización de México*, Vol. 3 (México D.F., 1944), p.211.

Nevertheless, the changes initiated by the Mexican Revolution –the rise of economic nationalism- started to become evident by the late 1920s. The consequence for the oil industry was the decline of production and the shift of investment elsewhere, chiefly to Venezuela.<sup>3</sup>

**Nominal investment in Latin America by the US and the UK in 1913 and 1929**  
(US dollars per capita)

	US investment		UK investment	
	1913	1929	1913	1929
Argentina	5.22	52.70	243.17	184.61
Brazil	2.11	14.47	49.11	42.98
Chile	4.33	91.96	95.87	90.57
Colombia	0.40	36.46	6.96	5.32
Peru	7.76	27.08	29.50	25.28
Uruguay	4.29	40.76	206.0	138.21
Mexico	36.30	41.92	42.53	-
Venezuela	1.15	55.34	15.83	31.45

Sources: Table 1.1-1 in (M.d.M. Rubio Varas, 2002) p. 23

By 1938 the Mexican oil industry was nationalised and the country followed an inward-looking strategy of depleting the oil just to the extent necessary to fulfil domestic requirements. A pattern only broken in the early 1970s when massive reserves were found in the south of the country.

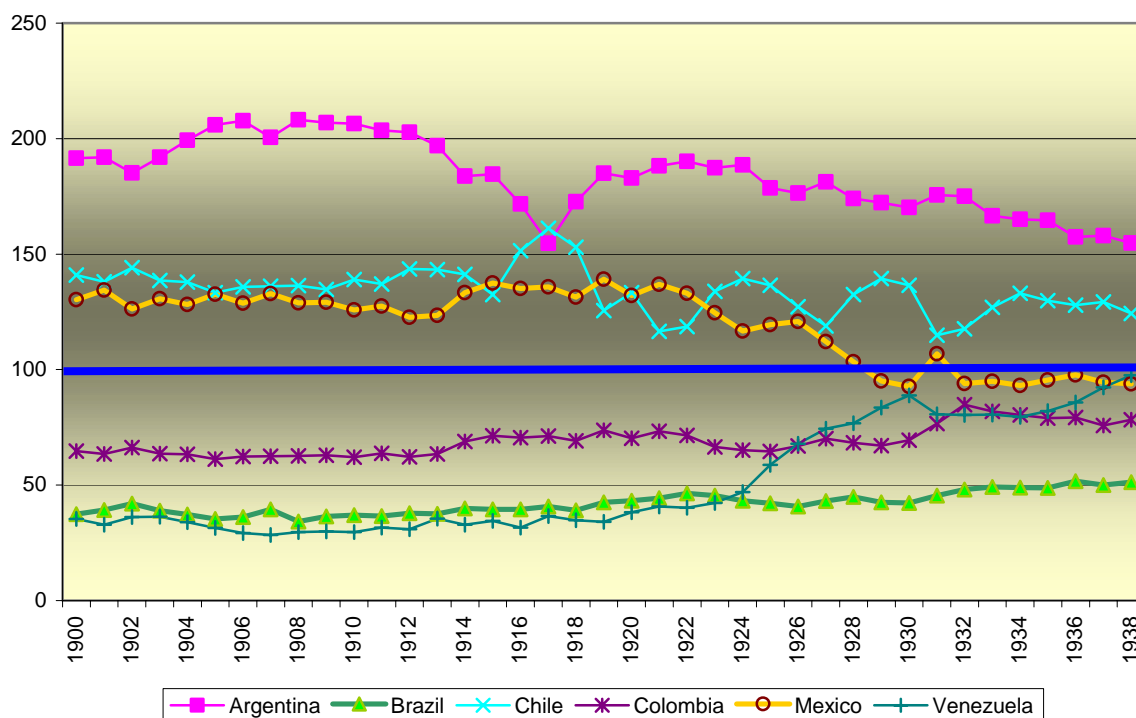
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<sup>3</sup> J.C. Brown, 'Why Foreign Oil Companies Shifted Production from Mexico to Venezuela during the 1920s', *American Historical Review* (1985) 90.

## The Mexican Economy at the dawn of the 20th century

At the dawn of the twentieth century Mexico based its economy on the primary sector, as did most of the rest of Latin America. Agriculture and mining (non-precious metals –copper, lead, zinc, silver, not as yet oil) accounted for most of the productive effort and exports.<sup>4</sup> A long dictatorship, Porfirio Díaz (1876-1911), brought the political stability that encouraged foreign investors to explore the countries' oil. The oil industry added to the 'export-led' pattern of the early part of the century, just displacing some traditional products such as silver.

### Index of GDP per capita of six Latin American countries, 1900-1938 (Latin American average =100)



Source: elaborated from data by (A.A. Hofman, 2000), pp.156-157. Latin American average refers to the average GDP per capita of the 6 countries referred.

<sup>4</sup> The following works provide good insight into the economic history of the early part of the twentieth century: Cárdenas, E. (compilador), *Historia Económica de México (5 Vols)*, Lecturas edited by P. Brazdresch, Vol. 64 (México, D.F., 1992-1994); Colegio de México, *Estadísticas económicas del Porfiriato: comercio exterior de México, 1877-1911* (México D.F., 1960); Colegio de México, Seminario de Historia Moderna de México, *Estadísticas económicas del Porfiriato: fuerza de trabajo y actividad económica por sectores* (México D.F, 1965); S.H. Haber, *Industry and Underdevelopment. The Industrialisation of Mexico, 1890-1940* (Stanford, 1989); C.W. Reynolds, *The Mexican Economy. Twentieth-Century Structure and Growth* (London, 1970).

Mexican growth performance during this period is described as high but yet unstable.<sup>5</sup> Mexicans commenced the twentieth century with the third biggest GDP per capita of Latin America. Nevertheless, between 1914 and 1920, the foreign enclaves, especially the oil industry, stood out as islands of prosperity in the sea of destitution caused by the Mexican Revolution.<sup>6</sup> The oil industry and the revival of mining in the 1920s helped to soften the immediate economic hardship of 'the revolution that overthrew Díaz which was followed by counter-revolution (1913), a counter-counter revolution (1913/14), a civil war (1914 –1917), a successful coup against the first constitutional president (1920), two more bouts of civil war (1923/24 and 1926 –1929), multiple filed coups(1920,1921,1922,1927), and a presidential assassination (1928). Mexico would not regain political stability until 1929.'<sup>7</sup>

The political instability may be at the core of the fall in the relative economic position of Mexico over the third decade of the century. While in 1921, the year of maximum production in the first era of the Mexican oil industry, Mexico reached 136 percent of the Latin American average GDP per capita, by 1935 Mexicans enjoyed a per capita income slightly below the Latin American average. Mexico would not regain its original position until the end of the 1970s thanks again to the rebirth of the oil industry.

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<sup>5</sup> R. Thorp, *Progress, Poverty and Exclusion. An Economic History of Latin America in the 20th Century* (New York, 1998), p.16.

<sup>6</sup> A. Knight, 'The Political Economy of Revolutionary Mexico, 1900-1940', in Abel and Lewis (eds.), *Latin America, Economic Imperialism and the State: The Political Economy of The External Connection form Independence to the Present* (London, 1992), p.295. See also Thorp, *Progress, Poverty and Exclusion. An Economic History of Latin America in the 20th Century*, p.68 and Reynolds, *The Mexican Economy. Twentieth-Century Structure and Growth* who initially demonstrated this.

<sup>7</sup> Haber, S.H., N. Mauer and A. Razo, 'When law does not Matter: The Rise and Decline of the Mexican Oil Industry', *The Journal of Economic History* 63 (2003) 1, pp.4-5.

## ***Oil in the Mexican Economy***

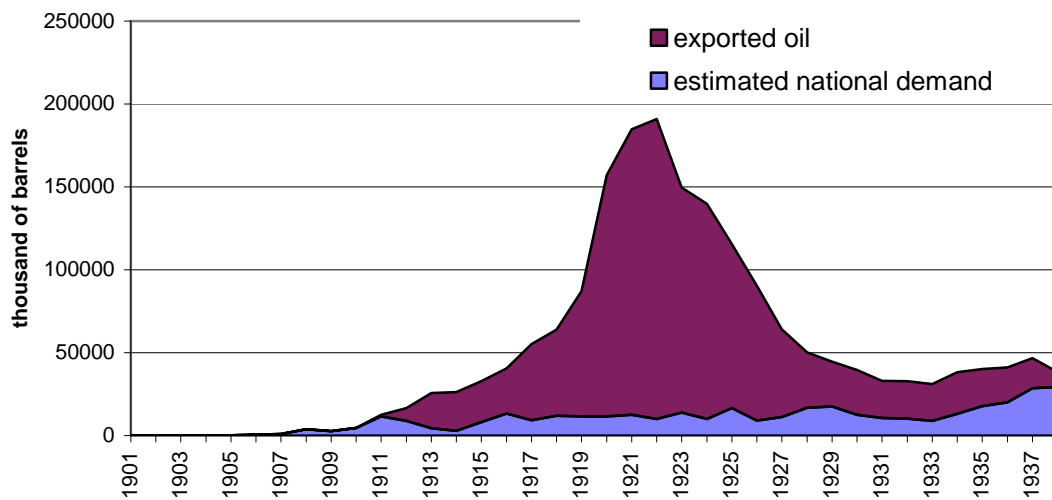
At the turn of the 20<sup>th</sup> century, oil in Mexico was not yet a major item of international trade and investment, neither a crucial source of power nor the object of bitter economic and political competition that it will become. For most people, chapopote was not more than a local curiosity or a local resource for fishermen and furniture-makers. Chapopote was the indigenous word for asphalt. It was used as a form of varnish or to waterproof boat bottoms.

Indeed, oil became only known by the catastrophes it caused.<sup>8</sup> In 1908, the British company of W. Pearson, hit a gusher. The well caught fire and burned uncontrollably for 58 days, with an estimated loss of a million tons of oil. When the raging fire was finally brought under control, the well produced only salt water. One year later, a second gusher, Portero del Llano No.4, burst from the soil at a tremendous pressure. Engineers improvised the technology required to tame the well: three million barrels of oil spewed into the surrounding countryside, devastating the fields over the 60 days before it was capped. From the perspective of the early literature, the accidents were justifiable; thanks to them, Mexican oil potential became known to the world. One can assume they were the cost incurred for the early development of the industry. Considering that the oil wasted in both accidents almost equalled the actual amount exported in those years, the cost acquires its full dimension. Waste was not yet a worry. This attitude slowly changed, partly due to the nationalism arising from the Revolution, and also to the increasing economic importance of oil for Mexico.

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<sup>8</sup> Summaries of the main accidents of this epoch originally extracted from journals and pamphlets of the time are available from the following sources: PEMEX, (Petróleos Mexicanos), *El Petróleo* (México D.F., 1970), pp. 130-135; 'Introduction' to J.C. Brown and A. Knight (eds.), *The Mexican Petroleum Industry in the Twentieth Century* (Austin, 1992); R.B. Mancke, *Mexican Oil and Natural Gas. Political, Strategic and Economic Implications* (New York, 1979).

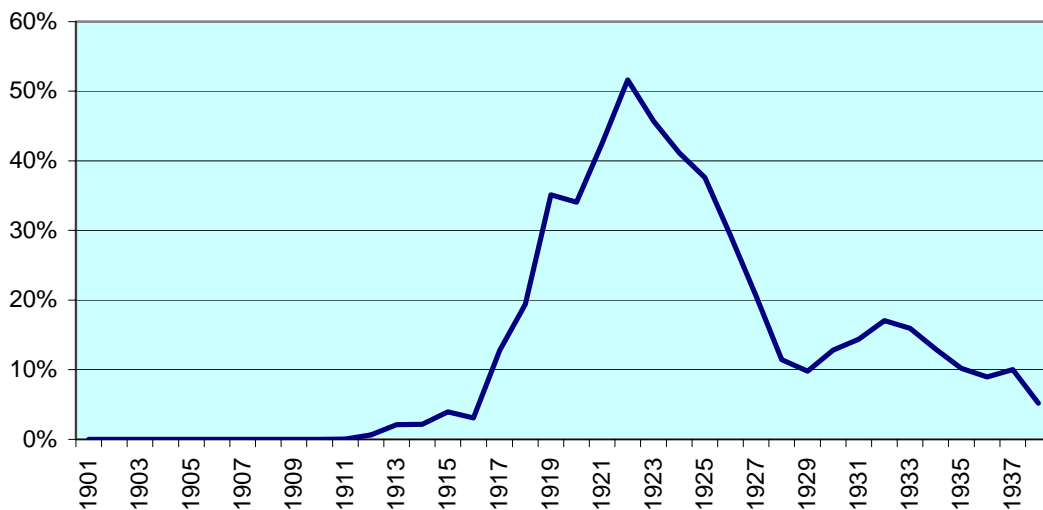
## Mexico: oil production (export and national demand) 1901-1938



Sources: own elaboration with data by (M.d.M. Rubio Varas, 2002). National demand estimated subtracting exports of oil from total production. From 1925 exports may include re-exports.

## Mexico: Value of oil exports as percentage of total export value, 1901-1938

Mexico Oil/total Exports



Sources: Rubio, M., 'Appendix B: Export Dependence Series' in (M.d.M. Rubio Varas, 2002)



Indeed, oil became economically relevant for Mexico's balance of trade and government budget by the 1920s. Half of Mexican exports were oil exports by 1921. Yet, by no means can Mexico be portrayed as a mere oil exporter country. Compared to other oil producers, Mexico's dependence upon oil was relatively small. For instance, in 1929 over two-thirds of the Venezuelan exports were oil exports, a figure only comparable with Brazil's dependence on coffee at that time, while Mexico's exports were mostly composed by minerals almost a decade before the nationalisation.

**Commodity Composition of Latin American Exports, 1929.  
(Percentages of total exports).**

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Argentina	Wheat 29.2; maize 17.6; frozen, chilled, and tinned meat 12.8; linseed oil 12.6
Brazil	Coffee 71.0
Chile	Nitrates 42.1; copper 40.4
Colombia	Coffee 60.6; petroleum 21.3
Cuba	Sugar 79.5
Mexico	Silver 20.6; other minerals 47.0, oil 10
Peru	Oil 29.7; copper 22.4; wool 21.0; sugar 11.5; lead 5.1
Uruguay	Wool 30.7; frozen, chilled, and tinned meat 30.2; hides and skins 12.7
Venezuela	Oil 74.2; coffee 17.2

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Source:: Table 1.1-3 in (M.d.M. Rubio Varas, 2002)

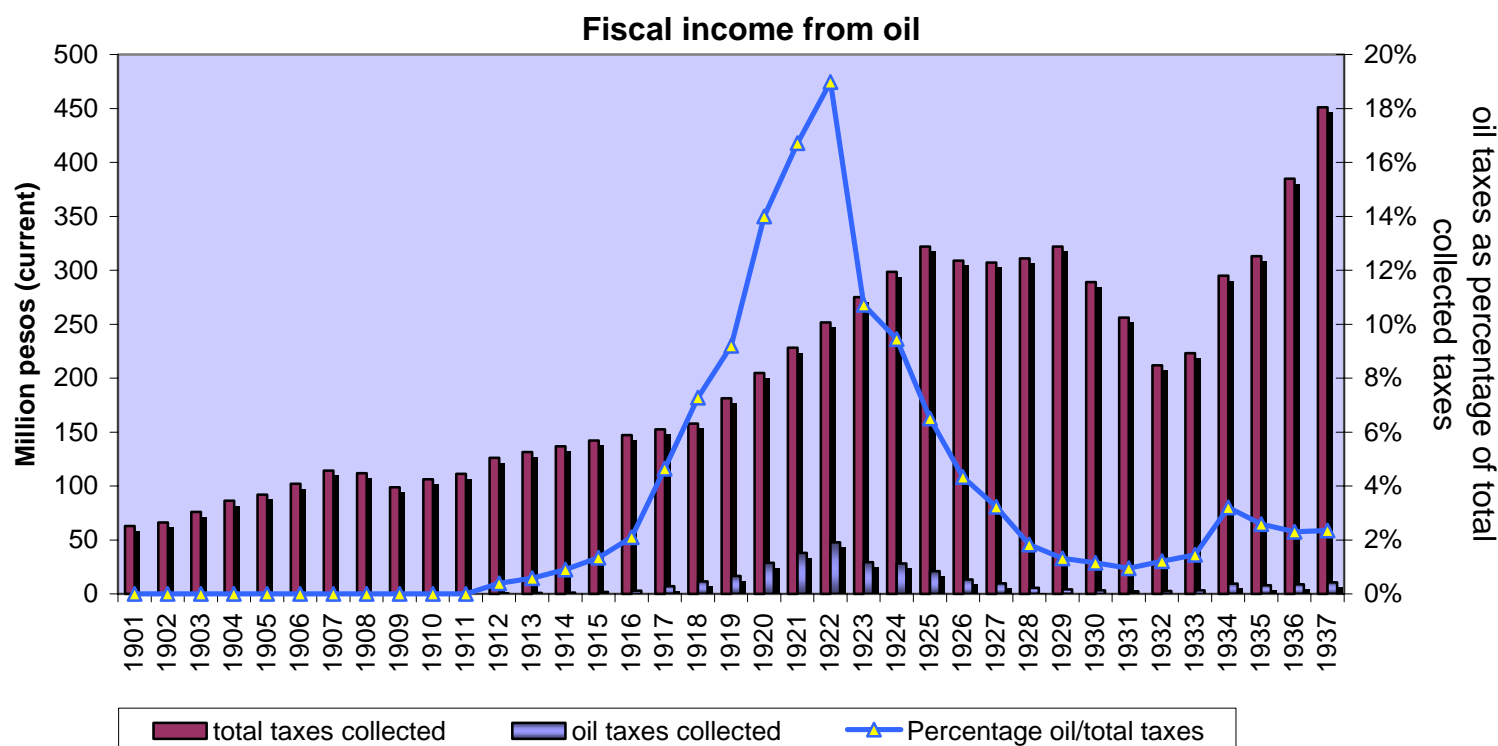
As mentioned above, during the early days of the twentieth century Mexico was following the pattern of a typical export economy, which depended upon increasing exploitation of natural resources with cheap labour and foreign capital and technology to expand production for overseas markets.

On the fiscal side, due to the small amount of oil produced for the first decade of exploitation (a maximum of 10 thousand barrels), the government did not bother to give it any special tax treatment until 1912.<sup>9</sup>

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<sup>9</sup> D.G. López Rosado, *Curso de Historia Económica de México* (México D.F., 1963).

## Mexico: Taxes collected from oil as percentage of total taxes collected 1901-1937



Sources: Rubio, M., 'Appendix C: Fiscal Obligations' in (M.d.M. Rubio Varas, 2002)

The Mexican government levied two main kinds of taxes from 1912 to 1938: production taxes and export taxes. The production tax on oil was a tax per unit (cubic meter). It was included within the 'Taxes over the exploitation of natural resources', which also comprised mining surface taxes, mining production, use of public waters, game, fishing, woodlands, etc. No production tax was levied on oil from 1901 to 1912. From 1901 to 1911, around 25 million barrels of oil were exported from Mexico without the payment of a penny in specific oil taxes.<sup>10</sup>

During the first oil boom in the early 1920s, oil taxes accounted for up to 20 percent of total government income. After nationalisation in 1938, the importance of oil taxes for government revenues continuously decreased and remained below 5 percent. Although important, these figures also point at the fact that, even at its peak years in the early 1920s, Mexico was never a pure oil exporter economy of the type of Venezuela or the Arab countries nowadays.

<sup>10</sup> M. Rippy, *Oil and The Mexican Revolution* (Leiden, 1972) p.137 quoting an official Mexican publication.

### ***The view of the contemporaries***

At the beginning of the first oil boom, in 1917, the geologist Miguel Bustamante wrote a long report that can possibly be considered the first Mexican oil monograph.<sup>11</sup> The whole of its second chapter is dedicated to ‘the future of the Mexican oil industry and its influence on the industrial development of the Republic’. What comes out of those pages can be called naive optimism. Naive because it implied hoping and dreaming about the limitless possibilities of oil as an engine of economic growth and political independence for Mexico. But overall, naive when considering Mexico as an unlimited producer of raw materials and hydrocarbon fuel. Apparently, Mexican gushers showed signs of lasting longer than in any other place in the world.<sup>12</sup> This was not only a Mexican view; a couple of years earlier, an article published in San Francisco stated that Mexican oil fields would last much longer than American ones.<sup>13</sup>

Despite considering the oil fields to be everlasting, Bustamante repeats once and again the importance of preventing the waste of Mexican natural resources for the future of the Republic. Here we find what is probably the most recurrent topic of Mexican oil history, namely, Mexican oil should be for today’s and tomorrow’s Mexicans:

‘ It is not enough that the land of our birth contains inexhaustible treasures and that our soil is fertile; it is also necessary to know how to take advantage of those resources and not to dissipate them on behalf of foreign nations...’<sup>14</sup>

‘[...]it will be possible to develop the exploitation of the natural resources that these territories contain in immense quantities and variety [...] in some other more prosperous time’.<sup>15</sup>

The first statement already shows the incipient nationalism regarding resource exploitation. Even if the resources were inexhaustible, the key was how to take advantage nationally. The second one points at a possible conservation strategy, waiting for better times for using the resources, which implicitly indicates a concern for future generations.

As would occur again in the 1970s, the forecasts in 1917 were over-optimistic. The potential estimated production was 200 million barrels per annum.<sup>16</sup> Such

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<sup>11</sup> México. Secretaría de Industria y Comercio, *El petróleo en la República Mexicana* (México D.F., 1917).

<sup>12</sup> *Ibid.*, p. 83.

<sup>13</sup> Huntley, L.G, San Francisco, 1915. Quoted in *Ibid.*, p 32.

<sup>14</sup> *Ibid.*, p. 91.

<sup>15</sup> *Ibid.*, p.103.

production would imply massive investment in infrastructure, but would allow the establishment of oil related industries and other industries supported by national demand in the Republic. Furthermore, industries established abroad would come to Mexico due to the unlimited quantities of hydrocarbons available and the advantage of low wages.<sup>17</sup> Oil could make it all possible. After all, oil was seen as the ultimate transforming force able to take the Mexican economy to a higher level:

‘Fortunately, the economic conditions of the Nation can be rapidly transformed by oil exploitation when we achieve a wide internal consumption [...] we shall be able to avoid the present lack of affordable fuel by having unlimited quantities, which has been so far the main obstacle to all our growth attempts.

In summary: to be profitable for the country our oil industry should endeavour, by all possible means, to use all of its production within the country in order to increase our means of transport and to develop national industry and agriculture’.<sup>18</sup>

The path towards economic success was through affordable energy for the country. Contrary to what happen in other Latin American countries (i.e. Venezuela), Mexico wanted to take advantage of oil as a source of energy within the country from the very beginning.

These ideals received their most famous –though not necessarily their most efficacious- assertion in the 1917 Constitution in which Article. 27 stated that:

‘The Nation shall at all times have the right to impose on private property such limitations as the public interest may demand, as well as the right to regulate the utilisation of natural resources which are susceptible of appropriation, in order to conserve them and to ensure a more equitable distribution of public wealth’<sup>19</sup>

Conservation and distribution issues were at the core of the article that would provide the constitutional basis for the oil expropriation.<sup>20</sup> However, the immediate post-revolutionary governments maintained a hands-off policy with regard to American

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<sup>16</sup> In order to understand the magnitude of that estimation one must consider that Mexico produced only 30 million barrels in 1916. The forecast multiplied the actual production times six.

<sup>17</sup> México. Secretaría de Industria y Comercio, *El petróleo en la República Mexicana* p. 104.

<sup>18</sup> *Ibid.*, p.100.

<sup>19</sup> Organisation of American States. General Secretariat, *Constitution of Mexico 1917* (Washington D.C., 1977), p.8.

<sup>20</sup> For an early analysis of the implications of the article see México, Cámara de Diputados (by M. de la Peña), *Estudio jurídico, político y económico sobre el Art 27 constitucional* (México D.F., 1921).

property, and the potential threat posed by the 1917 Constitution was not taken very seriously in the 1920s.<sup>21</sup>

Looking at contemporary sources, no one would be able to foresee the long decline of the industry for the half-century ahead. The predicted production of 200 million barrels per annum would not be achieved until some sixty years later. What took place in the years immediately after Bustamante's article was the rise and fall of Mexican oil production. By 1921 Mexico was the second biggest oil producer in the world but by 1928 production was below what it had been ten years before and it did not recover the same production levels until the 1970s.

The increasing disagreement between companies and government was both cause and consequence of the reduction in production. From the Mexican point of view, the companies exhausted oil fields in order to cope with demand. The so-called limitless capacity of Mexican oil fields turned into fears of exhaustion in the 1920s and 1930s.<sup>22</sup> From the companies' side, the government's increasing nationalist tendencies paralysed exploration and reduced production. The creation of national reserves –i.e., the retention of land for further exploration and potential exploitation by the state– exemplified the point made by the companies.<sup>23</sup> As a consequence, capital started to flow away from Mexico, particularly to Venezuela. For the companies, Venezuela was a better recipient of capital since they found legislative facilities similar to those of Mexico before 1910.<sup>24</sup>

Mexicans justified the decline of the oil industry in a different manner. The recent discoveries of oil in Venezuela attracted capital which otherwise would have been invested in further development of the Mexican industry, if Mexican oil fields had not been over-exploited beforehand.<sup>25</sup> The general agreement among Mexican scholars was that oil exploitation could not be done in a sensible manner when there were

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<sup>21</sup> R. Thorp, 'Economy, 1914-1929', in Bethell (ed.), *Latin America Economy and Society 1870-1930* (Cambridge, 1989), p. 63.

<sup>22</sup> M. Manterola, 'La Situación de la Industria del Petróleo en México y su Reciente Nacionalización', *Revista de Economía I* (1937) 1-6, p. 364.

<sup>23</sup> For a discussion of National Reserves see J. López Portillo, 'Las Reservas Petroleras Mexicanas', *Revista de Economía II* (1938) 7-12.

<sup>24</sup> On this matter see Brown, 'Why Foreign Oil Companies Shifted Production from Mexico to Venezuela during the 1920s', .

<sup>25</sup> At least that is the Mexican view expressed by several authors in the monthly journal of the National Union of Mexican Economists – *Revista de Economía*– quoted below. It is also the view of E. Sangines Villalva, 'La industria petrolera en México', *Revista de Hacienda II* (1938 Marzo).

several companies involved.<sup>26</sup> According to this view, fields would be totally exhausted under private exploitation. Oil was such an important element that its exploitation should be beyond individual interest. Oil should not be extracted for profit but for the salvation of a society. In addition, the companies were accused of hiding profits.<sup>27</sup> The companies were said to be distorting information about their profit margins in order to evade taxes. They were not only exhausting Mexican oil, but also going away without paying any compensation.

The economic literature dedicated to this period focuses on the development of the industry and to the somehow difficult relationships established between the foreign companies and the government.<sup>28</sup> More specific concerns in the Mexican case are the role of the workers and to the links between oil and the Revolution.<sup>29</sup> The different perspectives taken from inside and outside the country are readily observable within this early period. From the foreigners' perspective, the companies were responsible for the development of the country's market for the use of fuel, converting the economy to this modern source of industrial energy; for the expansion of production and refining of petroleum products for exports and for the overall improvement of the financial situation of the country and the generation of infrastructure. Nonetheless, the hosts did not view the petroleum industry developed by foreigners as an unmitigated blessing. They accused the wealthy companies of financing reactionary political movements, dividing and repressing the workers, extracting the nation's non-

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<sup>26</sup> The following sentences mostly come from: López Portillo, 'Las Reservas Petroleras Mexicanas', . Identical views are expressed by Sangines Villalva, 'La industria petrolera en México', .

<sup>27</sup> J. Silva Herzog, 'La expropiación de las compañías petroleras en México', *Revista de Economía* II (1938) 7-12.

<sup>28</sup> The first chapters of the following books, provide a good review of the initial stages of the Mexican industry: G. Grayson, *The Politics of Mexican Oil* (Pittsburgh, 1980 ); J. López Portillo, *El petróleo de México* (México D.F., 1975); G.A. Menéndez, *Doheny, el cruel* (México D.F., 1958); E.W. Owen, *Trek of the Oil Finders : A History of Exploration for Petroleum* (Oklahoma, 1975); PEMEX, (*Petróleos Mexicanos*) (ed.), *La Industria Petrolera en México : una Crónica* (México D.F., 1988), Vol. 1 and Chapter 8 in Rippy, *Oil and The Mexican Revolution* .

For Mexican governments relation with the companies see the first chapter of A.J. Bermudez, *The Mexican National Petroleum Industry: A case study in Nationalisation* (Stanford, 1963) and also D.C. Baldrige, *Mexican Petroleum and the United States-Mexican relations, 1919-1923* (London, 1987). Once again E. Lieuwen, *Petroleum In Venezuela: A History*, Vol. 47 (Berkeley, 1954) is useful for Venezuela. See also his E. Lieuwen, 'The politics of energy in Venezuela', in Wirth (ed.), *Latin American Oil Companies and the Politics of Energy* (London, 1985).

<sup>29</sup> For oil workers issues see V. Novelo, *La difícil democracia de los petroleros* (México, D.F., 1991); R. Ramirez Heredia, *La otra cara del petróleo* (México, D.F., 1979); S.L. Adleson, 'The Cultural Roots of the Oil Workers' Unions in Tampico 1910-1925", in Brown and Knight (eds.), *The Mexican Petroleum Industry in the Twentieth Century* (Austin, 1992). In relation with the Revolution see for example, J.C. Brown, *Oil and Revolution in Mexico* (Oxford, 1993) and Rippy, *Oil and The Mexican Revolution* .

renewable resources, and subordinating domestic needs to the international interest, making huge profits in the process.<sup>30</sup>

The controversy turned to a different issue after 1938. The literature on the causes, justification, process and consequences of expropriation-nationalisation is, by far, the largest among that dedicated to the Mexican oil industry.<sup>31</sup> From the American side, 'the expropriation' has no causes, no economic justification and terrible consequences for the Mexican economy.<sup>32</sup> The long and laborious process to reach a final settlement between the government and the companies also contributed to additional material in the literature.<sup>33</sup> But for many years afterwards, Mexican oil occupied an anonymous position within the country's literature, barely mentioned outside PEMEX's regular reports to the government and the nation. If oil did reappear as a topic from time to time, it was just in reappraisals of the nationalisation.<sup>34</sup> Mexico, which started the 20<sup>th</sup> century as a giant in the oil industry, only reappeared as an oil producer in the last quarter of the century.

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<sup>30</sup> Brown, *Oil and Revolution in Mexico*, p.1.

<sup>31</sup> For causes and consequences of the nationalisation it is worth looking at the following books: J.C. Brown and A. Knight (eds.), *The Mexican Petroleum Industry in the Twentieth Century* (Austin, 1992); J. Silva Herzog, *México y su Petróleo. Una Lección para América* (Buenos Aires, 1959); L. Meyer, *Mexico and the United States in the Oil Controversy. 1917-1942* (Mexico, 1972); L. Meyer and I. Morales, *Petróleo y Nación (1900-1987). La política petrolera en México* (México, D.F., 1990); For an official view see México. Secretaría de Patrimonio Nacional, *El Petróleo de México* (México D.F., 1940 1st ed., 1963) and J. Silva Herzog, *Historia de la Expropiación de las Empresas Petroleras* (México D.F., 1964). For a more radical perspective against the American see: J. Basurto, *El Conflicto Internacional en Torno al Petróleo de México* (México D.F., 1976).

For a plain justification see Garcia Robles, *La Question du Petrole au Mexique et le Droit International*.

<sup>32</sup> Among others, the obvious interested party Standard Oil Company, *The Reply to Mexico* (New York, 1940) but also W.C. Gordon, *The Expropriation of Foreign-Owned Property in Mexico* (Washington D.C., 1941) and R.B. Gaither, *Expropriation in Mexico. The Facts and the Law* (New York, 1940).

<sup>33</sup> 'Mexico's unsolved problem'. In *The Petroleum Press Service*. (London, 1941); M. Manterola, 'La Situación Actual de la Industria del Petróleo en México', *Revista de Economía* IV (1941) 16; Standard Oil Company, *Present Status of the Mexican Oil "Expropriations"* (New York, 1940); Standard Oil Company, *The Reply to Mexico*.

<sup>34</sup> The following texts reappraise the nationalisation from different perspectives. Bermudez, *The Mexican National Petroleum Industry: A case study in Nationalisation*; J.R. Powell, *The Mexican Petroleum Industry 1938-1950* (Berkeley, 1956); Silva Herzog, *Historia de la Expropiación de las Empresas Petroleras, 1917-1942*; Basurto, *El Conflicto Internacional en Torno al Petróleo de México*.

## REFERENCES

- Adleson, S.L.**, 'The Cultural Roots of the Oil Workers' Unions in Tampico 1910-1925', in Brown, J.C. and A. Knight (eds.), *The Mexican Petroleum Industry in the Twentieth Century* (Austin, 1992)
- American Petroleum Institute**, *Petroleum Facts and Figures* (New York, 5th ed., 1937).
- Baldrige, D.C.**, *Mexican Petroleum and the United States-Mexican relations, 1919-1923* (London, 1987).
- Bermudez, A.J.**, *The Mexican National Petroleum Industry: A case study in Nationalisation* (Stanford, 1963).
- Brown, J.C.**, 'Why Foreign Oil Companies Shifted Production from Mexico to Venezuela during the 1920s', *American Historical Review* (1985) 90, pp.362-385.
- Brown, J.C.**, *Oil and Revolution in Mexico* (Oxford, 1993).
- Brown, J.C. and A. Knight** (eds.), *The Mexican Petroleum Industry in the Twentieth Century* (Austin, 1992).
- Colegio de México**, *Estadísticas económicas del Porfiriato: comercio exterior de México, 1877-1911* (México D.F., 1960).
- Colegio de México, Seminario de Historia Moderna de México**, *Estadísticas económicas del Porfiriato: fuerza de trabajo y actividad económica por sectores* (México D.F., 1965).
- Grayson, G.**, *The Politics of Mexican Oil* (Pittsburgh, 1980).
- Haber, S.H.**, *Industry and Underdevelopment. The Industrialisation of Mexico, 1890-1940* (Stanford, 1989).
- Hofman, A.A.**, *The Economic Development of Latin America in the Twentieth Century* (Cheltenham, UK, 2000).
- Knight, A.**, 'The Political Economy of Revolutionary Mexico, 1900-1940', in Abel, C. and C.M. Lewis (eds.), *Latin America, Economic Imperialism and the State: The Political Economy of The External Connection from Independence to the Present* (London, 1992), pp.288-366.
- Lieuwen, E.**, *Petroleum In Venezuela: A History*. University of California Publications in History, Vol. 47 (Berkeley, 1954).
- Lieuwen, E.**, 'The politics of energy in Venezuela', in Wirth, J.D. (ed.), *Latin American Oil Companies and the Politics of Energy* (London, 1985)
- López Portillo, J.**, 'Las Reservas Petroleras Mexicanas', *Revista de Economía* II (1938) 7-12, pp.475-485.
- López Portillo, J.**, *El petróleo de México* (México D.F., 1975).
- López Rosado, D.G.**, *Curso de Historia Económica de México* (México D.F., 1963).
- Mancke, R.B.**, *Mexican Oil and Natural Gas. Political, Strategic and Economic Implications* (New York, 1979).
- Manterola, M.**, 'La Situación de la Industria del Petróleo en México y su Reciente Nacionalización', *Revista de Economía* I (1937) 1-6, pp.361-377.
- Menéndez, G.A.**, *Doheny, el cruel* (México D.F., 1958).
- México. Secretaría de Industria y Comercio**, *El petróleo en la República Mexicana*. Instituto Geológico de México, boletín 35, edited by Bustamante, M., (México D.F., 1917).
- Noriega, J.**, *Influencia de los hidrocarburos en la industrialización de México*. Monografías Industriales, edited by Banco de México, Vol. 3 (México D.F., 1944).
- Novelo, V.**, *La difícil democracia de los petroleros* (México, D.F., 1991).
- Owen, E.W.**, *Trek of the Oil Finders : A History of Exploration for Petroleum* (Oklahoma, 1975).
- PEMEX, (Petróleos Mexicanos)**, *El Petróleo* (México D.F., 1970).
- PEMEX, (Petróleos Mexicanos)** (ed.), *La Industria Petrolera en México : una Crónica* (México D.F., 1988).
- Ramírez Heredia, R.**, *La otra cara del petróleo* (México, D.F., 1979).
- Reynolds, C.W.**, *The Mexican Economy. Twentieth-Century Structure and Growth* (London, 1970).
- Rippy, M.**, *Oil and The Mexican Revolution* (Leiden, 1972).
- Rubio Varas, M.d.M.**, 'Towards Environmental Historical National Accounts for Oil Producers: Methodological Considerations and Estimates for Venezuela and Mexico over the 20th Century' (PhD, London School of Economics, 2002).
- Sangines Villavalva, E.**, 'La industria petrolera en México', *Revista de Hacienda* II (1938 Marzo)
- Silva Herzog, J.**, 'La expropiación de las compañías petroleras en México', *Revista de Economía* II (1938) 7-12, pp.447-457.
- Thorp, R.**, 'Economy, 1914-1929', in Bethell, L. (ed.), *Latin America Economy and Society 1870-1930* (Cambridge, 1989), pp.57-82.
- Thorp, R.**, *Progress, Poverty and Exclusion. An Economic History of Latin America in the 20th Century* (New York, 1998).