

Public Finance, Foreign Creditors, and the Costs of the Mexican Revolution *

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Abstract

In this paper we study the impact that the Mexican Revolution had on Mexico's economy by looking at the effects of political instability on the public finances and the relationship of the government and its foreign creditors. The predominant view of the economic historiography sustains that political instability had only a short-term effect on growth. We sustain that political instability had more than a short run effect on the government finances because it perpetuated the government's incapacity to access foreign funds, which could have helped to control the volatile political atmosphere. We argue that not having access to new debt issues was the penalty that induced Mexico's government to negotiate two agreements to resume payments. We conclude Mexico could not borrow again in international debt markets in the 1920s because the internal political instability hindered its capacity to make regular payments and build a credible commitment with international creditors. This was costly for the country because the government never had the financial capacity to establish law and order, but still ended up diverting resources to fight insurrections, which could have been used to promote growth.

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I. Introduction

What were the costs of the Mexican Revolution? What impact did political instability have on Mexico's growth path? In this paper we study the impact that the Mexican Revolution had on Mexico's economy by looking at the effects of political instability on the public finances and the relationship between the government and its foreign creditors.

After being neglected for a long time, the economic history of the Mexican Revolution (1910-1920) has begun to get the attention of scholars who are trying to

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assess its economic costs and consequences. According to Womack (1992), most of the historiography on the topic maintained that during the violent years of the Revolution "there could have been nothing but destruction, upheaval, and ruin: a veritable productive disaster".¹ According to this author, this conclusion was not result of factual analysis, rather it was based on the Spenserian idea that there can be no "progress" without "order".

Today, most of the literature suggests that even if the Revolution had a negative economic impact in the short run, there was an era of rapid economic growth as soon as the most violent period was over (in 1920).² There are two explanations of how growth was resumed after 1920. For some, the Revolution destroyed pre-modern institutional arrangements that curtailed Mexico's capacity to grow. Thus, it opened the way for a more prosperous era of growth than what Mexico could have achieved otherwise.³ For others, the Revolution was only an interruption of the previous growth path, which the country simply resumed later.⁴

In the second stream of the literature, the work by Haber, Razo, and Maurer (2003) has taken the debate of the economic effects of the Mexican Revolution to the realm of detailed quantitative history. Their analysis shows that while some sectors, such as petroleum extraction, prospered in the midst of turmoil, others, such as banking, suffered a hard blow and did not fully recover after several decades. Yet, most of the sectors of the Mexican economy showed the following pattern: "output and investment fell sharply during the civil war of 1914-1917 but (...) quickly recovered their former levels and rates of growth—even though the political system continued to be unstable until 1929."⁵ This conclusion leads the authors to claim the broader hypothesis that "there is no necessary connection between political instability and economic stagnation."⁶

Recent findings on the demographic consequences of the Revolution, however, suggest a gloomier picture. McCaa's analysis shows that in terms of lives lost, the

¹ John Womack (1992), p.392.

² See Reynolds (1970); Vernon (1963); Solís (1967, 1970).

³ Tannenbaum (1933 and 1950); Vernon (1963); Cumberland (1968)

⁴ Although this thesis was not explicitly developed by any author(s) it was suggested in de la Peña (1975); Rosenzweig (1965); Valadés (1948); Gilly (1994); Keesing (1975); Jean Meyer (2004).

⁵ Haber, Razo, and Maurer (2003), p.14.

⁶ Haber, Razo, and Maurer (2003), p.15.

Mexican Revolution was a demographic catastrophe, comparable to the Spanish Civil War, and the greatest in Mexican history since the conquest. The demographic cost of the Revolution was 2.1 million people, of which excess mortality accounted for two-thirds, lost births one-fourth and emigration considerably less than one-tenth of the total (McCaa, 2003 p.396). Moreover, Mexico's demographic recovery from Revolution was slow. Total growth from 1910 to 1930 amounted to 1.4 million less than the increase for 1900-10. Unless we considered that the population lost was totally redundant, its loss must have had a cost in terms of Mexico's GDP (McCaa, 2000 p.294). Definitely more research needs to be carried out to bring together these two very different stories. This paper is a small step in this difficult task.

We contribute to this debate by looking at the impact that political instability during and after the revolution had on one crucial sector of the Mexican economy: the government. We look at the effect the Revolution had on the ability of the government to achieve economic stability and promote growth during the 1920s by studying the impact the recurrent military rebellions had on the public finances and the capacity of the government to issue foreign debt.

We sustain that political instability had more than a short run negative effect on the government finances. The prevailing instability during the 1920s forced the government to increase military expenditures and sacrifice funds that would have allowed the government to generate a credible commitment to foreign creditors. This unstable equilibrium put the Mexican government into a vicious circle. In order to fight political upheavals the Mexican government had to increase military expenditures and suspend debt payments. Even after 1917, when the most anarchic years of the Revolution (1914-1916) were over, political instability forced the government to incur in huge military expenditures that generated great fiscal deficits. Unexpected increases in military expenditures to fight rebellions complicated the payment of the external debt service, which was a necessary condition for the country to access more funds in international capital markets. Thus, Mexico could not benefit from the important flows of foreign capital other Latin American countries obtained during the 1920s (e.g. Argentina, Brazil, and Chile), even if it had a lower debt burden (e.g. in debt per capita). This limited the Mexican government's ability to pacify the country, invest in reconstructing

infrastructure left from the pre-revolutionary years, and pay for the social expenditures that would provide widespread popular support.⁷

Most of the literature that has studied the financial situation of the Mexican government during the 1920s, stresses that it was in constant need of resources to fight the political instability generated by the Revolution (Zebadúa, 1994; Aboites, 2003; Uthoff, 2005). We suggest that if it had not been for the political instability that prevailed after the Revolution, Mexico would have been able to make payments on its foreign debt and would have probably gotten new loans. Mexico stopped making coupon payments on its foreign debt in 1914. Then, in April 1917, Mexico announced it would resume payments on its foreign debt. The negotiations between the Mexican government and the representatives of the bondholders were slow before 1920. In 1922 the first debt agreement was signed between the two parties. But, by 1924, this agreement was suspended because a rebellion forced the government to increase war expenditures. In 1925, a second agreement was signed. But, in 1928, the government had to stop payments, mainly because a series of violent political events and rebellions complicated the payment of the debt service.

The outstanding literature on the issue of foreign debt defends the hypothesis that it was optimal for the Mexican government to default given the game and the payoffs that it faced in the post civil war years, especially in 1924. The hypothesis is that Mexico could not have borrowed more because there were no credible penalties foreign creditors could impose on it, which would give enough incentives for creditors to provide new loans and for Mexico to reestablish payments.⁸ For this reason the cancellation of the 1922 debt agreement between Mexico and the United States would have been the optimal strategy for the Mexican government that took power in 1924.⁹ Given this game, the optimal response of the government was to default on its foreign debt. This would allow it to concentrate on forging alliances internally and to rebuild the domestic banking

⁷ Marichal, 1989, pp. 171-200 describes the loan boom that Latin America lived in the 1920s.

⁸ Penalties in the sovereign debt/country risk literature are understood as any actions that creditors can take to induce payments from the sovereign borrowers. Common penalties include invasions, trade embargos, blocking borrowers from further debt issues, confiscating a country's assets (in the country or in a foreign country), and any other punishments that can actually induce payment. See, for example, Eaton, Gersovitz, and Stiglitz (1986), p. 490.

⁹ Haber, Maurer, and Razo (2003), p. 102.

system. The situation was tough for Mexico in 1924 because, according to Haber, Razo, and Maurer (2003), it "was subject to few penalties by foreign lenders short of sending in the Marines to dislodge the government, something the United States was in no way prepared to do." Therefore, even if Mexico wanted to repay its debts, "it was extremely unlikely that foreigners would extend more credit" (p. 102).

In this paper, we show that defaulting was not the government's dominant strategy during the 1920s. Mexico suspended payments only as a consequence of unforeseen political instability, in the form of army rebellions and internal armed conflicts. In fact, we show that the government had every intention to resume payments after the civil war years (1914–1916) were over and throughout the 1920s. We sustain that the Mexican government expected new external loans and the threat of being excluded from foreign credit markets induced it to look for a solution. This was a credible penalty because most large Latin American countries and "emerging markets" were issuing new bonds during the 1920s.¹⁰ And since Mexico's profile was better than or at least as good as that of other Latin American sovereign borrowers, then Mexico must have had good chances of getting a new loan. We show econometrically that holders of Mexican sovereign bonds in London reacted positively (with clear breaks in the time series) whenever the Mexican government resumed payments, but mostly when they realized the government would not pay because of an insurrection.

Our counterfactual is that since investors still had hope that Mexico was going to resume payments and be in good standing, since funding loans to reorganize sovereign debt were common, and since Mexico had a relatively lower debt burden than many other countries who issued debt in the 1920s, then Mexico without the political instability Mexico would have been able to issue new debt. A large debt issue would have helped the government in at least two ways. First, it could have issued a new debt to pay the salaries it owed. Second, a new loan could have helped the government to cut the number of employees and soldiers by paying them good liquidations. The impossibility of boosting the public finances with a foreign loan just made the government more vulnerable to further insurrections (sometimes promoted by rebellious government officials who recruited bureaucrats with unpaid salaries).

¹⁰ Marichal (1989), pp.171-200.

We divide the paper into five sections. In section II, we make a narrative account of the financial situation of the Mexican government after the Mexican Revolution, with an emphasis on its capacity to build a credible commitment to pay foreign creditors after every debt renegotiation. In section III, we explain the methodology followed to test our hypotheses and describe our data sources. In section IV, we present the main findings that support our argument. Section V concludes.

II. Data and Methodology

Studying the impact of the Mexican Revolution on the Mexican government finances required us to complete the government budget series existent using primary sources. The revenues and expenditures series of Mexico were incomplete in most official and academic publications. The historical series usually ended in 1910 and started again in 1925 (or 1923 when the reports of Minister of Finance Alberto J. Pani are used). We reconstructed the budget figures using the budgets submitted to Congress and published in the daily *El Democrata*, and in the *Mexican Year Book* of 1920-21. Data for the period 1914 to 1918 was not available from these sources given the complicated situation of the public finances during the civil war years (1914-1916) and the initial disorder of the Carranza government in 1917 and 1918. From the detailed budget data (not included here to save space, but available upon request), we separated the expenditures of the Ministry of Defense and Navy, in order to see the toll that the war took on the public finances. We complement this information from data of arms' exports from the United States to Mexico from 1870 to 1929.¹¹

We describe the changes in the debt service and built debt service series following the agreements of 1922 and 1925 using the narratives of Turlington (1930), Pani (1926), and Bazant (1995). Finally, we also used these sources to describe the changes in the penalties imposed on Mexico, such as the move to put the National Railways of Mexico in receivership under the supervision of the International Bankers Committee (IBC).

¹¹ : United States, Department of Commerce. Bureau of Foreign and Domestic Commerce (1904-1911 Department of Commerce and Labor, before 1904 Treasury Department, Bureau of Statistics) *The Foreign Commerce and Navigation of the United States*. Washington: GPO, 1870-1929.

For comparing Mexico’s debt burden to that of other Latin American countries, we compiled data on population, revenues, expenditures and exports published in the *Investor’s Monthly Manual* every semester. The data was very incomplete and imprecise, but we wanted to work with data that investors had at their disposal. We also draw comparisons across countries with data compiled by Turlington (1930), which reflects debt burden for a group of countries for which the League of Nations had available data for the year 1925.

For testing the impact that announcements of the Mexican government had on the quotations of the Mexican bonds in London, we constructed a monthly series of Mexican bond risk premium from 1900 to 1929 following the standard methodology of the literature that studies country risk.¹² Therefore we define the risk premium implicit in the price of Mexican bonds as the difference between the Mexican bond yield in London and the British Consols yield (the risk-free asset):

$$\text{Risk premium} = \text{Yield}_{MEX} - \text{Yield}_{UK},$$

where the yield of the Mexican bonds (Yield_{MEX}) is defined as the ratio of the coupon payment to the monthly market price (the British Consols bond is estimated in the same way using Consols with a 3% coupon rate). The Mexican bond prices used refer to the *Investor’s Monthly Manual* quotations of Mexican gold bonds of 1899 with a 5% coupon rate. This source provided continuous quotations from 1900 to 1929, including the civil war years (1914-1916). The British Consols monthly quotations were taken from the NBER Macroeconomic History database.

This paper makes an important assumption in order to study the behavior of bondholders in London. The Mexican bonds were in default since the last quarter of 1914. Therefore, there were no coupon payments made on these bonds that would allow us to estimate the yield properly. Nevertheless, we wanted to work with the movements of Mexican bond prices in London in relation to a benchmark risk free asset such as the consols rate. For that reason we assumed that the Mexican bonds paid coupons (of 5%) throughout the period to construct our series of risk premium. This allows us to study the price movements of Mexican bonds “clean” of variation in the risk free asset. We know that using this methodology introduces a bias in our series, but we do not believe that

¹² For instance see Sussman and Yafeh (2000) for a discussion.

modifies our results because the bias affects all of our observations after 1914 and we avoid using the data to make comparisons between the pre-1914 and post-1914 levels.

We follow two methodologies to study whether there were any events or announcements of the Mexican government that significantly altered the risk premium series. First, we follow a somewhat modified version of the event study of Sussman & Yafeh (2000), who looked for structural breaks in the series of Japanese bonds risk premium from 1870 to 1914 using a Chow Break Point Test (Chow, 1960). Second, we use the methodology suggested by Bai-Perron (1998) on multiple structural breaks. We do not study short term variations, because we are not so concerned with the magnitude of the shocks in a month to month basis. We only use econometrics to study whether there were events which significantly changed the structure of our time series. The magnitude of short term effects on the series are not provided econometrically, but are discussed using the graph of the risk premium.

First we run a somewhat modified version of the methodology of Sussman & Yafeh (1998), looking at structural changes using the ex-ante knowledge of some of the relevant announcements and events that might have mattered for bondholders. We run a simple model, which mimics Sussman and Yafeh’s model, and run a Bai-Perron test. The model we use has the following form:

$$\ln Y_t = \beta_0 + \beta_1 \ln Y_{t-1} + \beta_3 \ln Y_{t-1} * EVENT_{long} + \varepsilon_t^{13}$$

where $\ln y_t$ is the logarithm of the risk premium in period t , and $EVENT_{long}$ is a dummy variable that multiplies $\ln y_{t-1}$. The variable $EVENT_{long}$ has a value of zero until the moment of the event we select ex-ante according to historical research and it takes the value of one thereafter.

This test requires to make an a-priori assumption of the dates we consider structural breaks could have taken place to see if they satisfy the Chow Break Point Test. The Chow method consists of generating several sub samples of the original series that start on the dates proposed, it compares the sum of the residuals obtained in the restricted and unrestricted models that characterizes the series through an F-statistic test. We

¹³ We acknowledge that the functional form selected for this test does not follow conventional time series specifications, but it yields heteroskedasticity-consistent residuals with no serial correlation.

propose changes for several dates described in Table 2 when important historical changes took place. Table 2 gives the results of the Chow Break Point Test to the sample 1915-1928.

We then carry out the Bai-Perron test using the same model. The advantage of this method is that it does not require to know a-priori the dates of the breaks, but only to indicate the maximum number of structural changes in the series. The Bai-Perron test is based on a contrast that departs from the hypothesis that the sum of the square of the residuals should be minimal when there is a structural break. It uses the first break date obtained to find out if in a sub sample calculated from that date on there exists another possible structural break. The limitation of this method is that it requires an a-priori assumption of the number of possible breaks in the series. However, it is possible to carry out another test, developed as well by the authors, to know if there are more changes, and in that case the number of assumed changes is increased. Thus, it allows us to modify the number of breaks until the model is optimized. The test provides the exact date of the breaks that satisfy the criteria the test imposes. We ran this test restricting the sample to 1914-1929 a period for which we have comparable data, results are reported in Table 3.¹⁴

III. The Failed Attempts to Build a Credible Commitment in the 1920s.

In this section we describe the continuous negotiations of the government with foreign creditors throughout the Revolution and the 1920s. The Mexican government was continuously negotiating the resumption of interest payments on the debt, hoping that reestablishing relations with foreign creditors would provide access to new funds. The negotiations and the agreements were suspended over and over mostly as a consequence of the political instability that prevailed during most of the 1920s.

¹⁴ The sample starts in April 1914 because we avoided mixing the data where we assumed coupon payments that did not actually exist, with that when coupons were actually being paid. It ends in May 1929 because afterwards world risk increased dramatically. The Bai-Perron test results are not modified in a relevant way when the sample is extended to 1910-1929, the main difference is that September 1914, the date of the first debt default appears as an additional structural break, and February 1927 loses importance.

The Mexican government had done many renegotiations and defaults on its foreign debt during the nineteenth century. Loans of the Mexican government were floated early in the independent life of the country. Mexico declared independence in 1821 and the first issues of debt followed a few years later. In fact, different governments throughout the century were able to float debt, but the political instability that followed independence made it hard for them to find a stable source of revenue to pay the service of the external debt regularly. Many debt renegotiations took place during the first decades of the century, but the short life of most national governments and the continuous wars between Liberals and Conservatives did not allow the different governments to respect those agreements.¹⁵

In 1886, the government of Porfirio Diaz reached an agreement with foreign bondholders and resumed payments on the foreign debt. Two years later Mexico had its first successful debt consolidation.¹⁶ By this time, the country was much more stable politically and government sources of revenue had increased as a consequence of this stability. After 1888, the Mexican government was able to consolidate and refund its sovereign debt in better terms at least in 1899, 1904, and 1910. By 1910, the government of Diaz had achieved such a high esteem in foreign financial markets, that most of the debt issued during his regime was in foreign hands. For example, his finance minister, Jose Ives Limantour, organized the purchase of several lines of railways that belonged mainly to British and American interests. For this purpose the government of Diaz issued mortgage bonds to pay for the control of these companies. Mexican bonds quoted in London enjoyed their most stable quotations during this period (see Figure 2).

In 1908, Diaz declared that Mexico was ready for democracy and promised he was ready to surrender to a democratically elected successor. In the presidential election of 1910, his contender, Francisco I. Madero, alleged Diaz committed electoral fraud and several armed groups around the country rebelled against the Diaz regime. After a few months of uprisings, Madero secured the presidency. The economy continued to prosper, but Madero was not able to satisfy the demands of the armed groups that had supported

¹⁵ Bazant (1995).

¹⁶ D'Olwer (1964), pp. 1006-1010; Bazant (1995), pp.134-137.

him.¹⁷ Civil unrest continued until 1913, when Victoriano Huerta, the chief of the armed forces organized a Coup d'Etat against President Madero and tried to elect himself as a new president. Many governors, generals, and armed groups around the country did not recognize Huerta as president and rebelled against him.

Until 1914 Huerta had been able to pay the coupons on the external debt and secured a new loan from a syndicate of foreign and domestic banks. The new loan helped him to fight the insurgents, but not for long. The insurgents created a united front that overthrew Huerta in 1914. The united front fell apart after the fall of Huerta and there was a violent war between the different armed groups to control the presidency. Among those groups were the armies of Emiliano Zapata, Francisco (Pancho) Villa, and Venustiano Carranza. By the end of 1916 Mexico City and most of the conflict zones were under the control of the group of Carranza. As Figure 1 shows there was a huge spike in the imports of arms and munitions during these years.

Although we do not have data on governments' expenditures and revenues from 1914 to 1917 we know that it increasingly ran into deficits. In 1913 Huerta government suspended its debt payments to banks in Mexico and began to demand forced loans from them. The credibility of bank notes began to deteriorate, the public exchanged them for specie, and the peso depreciated rapidly. From 1914 to 1916 the government and the revolutionary armies turned to money issuing as a source of finance generating an increasing inflation that turned into a hyperinflation in 1916.¹⁸ The hyperinflation ended in December 1916 when the public ceased to accept paper money, cutting drastically the possibility of the government to finance through inflationary taxes throughout the 1920s.¹⁹ Moreover through forced loans and a bank seizure in 1916 the government had exhausted the funds domestic banks could have provided, leaving the Mexican banking system in total disarray, and ending any possibility of government's financing through internal debt.²⁰ Until 1925 the banking system was almost inexistent and any loans the government could obtain came with extremely high interest rates because of the illiquid credit market (and to compensate for the risk of having the government overthrown). For

¹⁷ Méndez Reyes (1996).

¹⁸ Gómez-Galvarriato and Recio (2007) pp.6-7; and Gómez-Galvarriato and Musacchio (2000).

¹⁹ Paper money did not circulate again in Mexico until 1931.

²⁰ Gómez-Galvarriato and Recio (2007)

example, before the creation of the central bank in 1925, "the normal interest rate around the Republic in 1924 was of between 18% and 24% annually."²¹ Still, after the creation of the central bank interest rates fluctuated between 7% for inter-bank loans to 10% for regular loans.²² Thus, the possibility of accessing foreign loans became more important for the government.

In 1917, once the government of Venustiano Carranza had achieved some internal peace and a new Constitution had been drafted, the Mexican government had two options. It could default on the foreign debt or it could try to negotiate a foreign loan and resume Mexico's foreign debt service. They chose the latter without much hesitation. Only this time Mexico's bargaining position was different.²³ The 1917 Constitution had abrogated the property rights of foreigners exploiting mines and oil wells in the country. According to article 27, land was property of the nation, but left unclear whether this was retroactive or not. In any case, the interest of foreign nationals, mostly Americans living in Mexico, was severely threatened and the US State Department took it seriously.

The first negotiations for a new loan for the Carranza government started in New York in early 1917. But the loan did not materialize because the bankers, under pressure from the State Department, ended up asking for a U.S. government guarantee for the loan. The State Department wanted the bankers to push Mexico to recognize damages to American citizens caused during the civil war years and to protect the property rights of foreign nationals, especially the oil companies.²⁴

It seemed like Mexico was in no position to resume payments on its foreign debt without the support of a foreign loan. Pacifying the country required large amounts of money. Keeping generals and their armies loyal usually implied the government had to distribute payments and subsidized loans among the many army officials. Even with the rapid increase in customs revenue from the export of oil and other raw materials to the countries at war, the government was running a deficit. In Table 1, we can see that during

²¹ This is according to declarations of Alberto Mascareñas, director of the Central Bank, in a conference he gave in 1928, as cited in Torres Gaytan (1990), p. 173.

²² Torres Gaytan (1990), p. 173

²³ Uthoff (1998)

²⁴ Zebadúa (1994) pp.116-133

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the Carranza presidency more than half of the expenditures were going to the Ministry of Defense and Navy-.

In 1918, the Carranza government started a negotiation with J.P. Morgan, Speyer and Co., and other banking houses to organize a "refunding of the Mexican debt into a single comprehensive issue of bonds..." (Turlington, 1930, p. 275). In the proposed plan the Mexican government was willing to offer custom revenues as a security for the loan. American envoys were allowed to study the situation of Mexico's finances during this time.²⁵ But, financiers in New York were expecting Mexico to commit certain fiscal revenues for the payment of the loan in the budget submitted to Congress. The Mexican budget did not include such guarantees, mostly because the government finances were committed with military expenditures to keep the armies and generals under control, and the possibility of a loan faded away.

In February 23, 1919, bankers and representatives of foreign bondholders from the United States, England, and France, created the International Bankers Committee (IBC). The IBC included the most prominent and influential commercial and investment banks of the time. It was designed to be a powerful negotiator between bondholders and the Mexican government. No major bank in the world would have been able to build a syndicate to lend to Mexico without having a selection of IBC members. In fact, the IBC, with the support of the State Department, could block any new loans that any competitor banks could offer to Mexico. Under the IBC agreement, Mexican debt bondholders would adhere to the IBC agreements with the Mexican government voluntarily. At its peak the IBC represented 97% of Mexico's debt holders (in 1925). Within the IBC J.P. Morgan took the lead and named one of his associates, Thomas Lamont, chairman of the committee.²⁶

The Mexican government, again, had the option of renegeing on the debt and not recognizing the IBC. Instead, the Carranza administration immediately recognized the IBC and started cooperating with them. With J.P. Morgan leading the IBC, it would have been easier to convince bondholders of changing the conditions for Mexico's resumption

²⁵ McCaleb (1921) and Lill (1919).

²⁶ For information on the IBC see Turlington (1930), especially p. 276-277.

of payments and, possibly, accessing a new loan issued by a syndicate of banks from the committee.²⁷

Between the last months of 1919 and the beginning of 1920, the Mexican government tried to clarify the property rights confusion started by the new Constitution and promised to resume interest payments on the foreign debt. The government was actually willing to negotiate the constitution in order to resume payments, and why not, obtain a new loan. At the end of 1919, the government unveiled plans to reorganize its financial office in London and to resume interest payments on the foreign debt. Also, in Mexico, the government promised to respect all the vested interests, whether acquired before or after the adoption of the Constitution. These actions sent a very positive signal to creditors. Figure 3 shows the reaction of investors in London, the price quoted for the Mexican bonds went up rapidly after these announcements.

Yet, the Mexican government had to suspend the resumption of interest payments in April of 1920. During this month the electoral tensions between the government and the opposition candidate, the powerful general from the state of Sonora, Alvaro Obregón, escalated into a military conflict. The government tried to impose a general loyal to Carranza as regional commander in the northwest of the country. This challenged the powerful group of generals of Sonora (e.g., Alvaro Obregón, Plutarco Elias Calles and Adolfo De la Huerta) and the state started a war against the federation. The country was divided into two groups of army generals, those supporting the Sonora group and their leader (Alvaro Obregón) and those supporting President Carranza. The Obregón faction dominated the military campaign and Carranza was assassinated in May 20 as he was fleeing Mexico City towards Veracruz. The extraordinary expenses of this military campaign were so large that the resumption of debt payments was suspended until a new government was elected.²⁸ To insure the triumph of Obregón in the 1920 presidential election, General De la Huerta was named provisional president. He recognized the constitution and monitored the presidential election. General Obregón won the election as the official candidate (Meyer, 1991; Matute, 1980).

²⁷ Zebadúa (1994), pp.139-148.

²⁸ Zebadúa (1994), pp.149-153

During the administration of President Obregón the renegotiation of the debt became a priority. Obregón started his presidency during the prosperous post-World War I years. Demand for Mexican oil and minerals continued to increase rapidly and Mexico's fiscal revenue reached historical levels. As we can see in Table 1, 1920 was the first year when the Mexican government had a fiscal surplus since the civil war was over. Fiscal revenues grew almost 40% in that year alone. Moreover, in July 7, 1921, Minister of Finance Adolfo De la Huerta introduced a new tax on oil exports. The tax was designed to obtain funds for the resumption of payments on the external debt.²⁹ This put Obregón in a comfortable position to resume payments on the foreign debt.

In June 16, 1922, Minister of Finance De la Huerta and Thomas Lamont signed a debt agreement to resume Mexico's debt payments. Mexico recognized all principal, amortization, and interest payments overdue for all the sovereign debt issued until 1910 (excluding the debt contracted by the administration of Victoriano Huerta in 1914), some states' debt, and all the bonds the Porfirio Diaz government had issued to buy the National Railways, which amounted £ 145,173,759 (about \$1.5 billion pesos). All the interest and amortization payments in arrears since 1914 were going to be paid in 40 annuities of equal amounts, beginning in January 1, 1928.³⁰ Also, the Mexican government offered to resume the debt service by making annual payments of \$30 million pesos beginning in 1923, adding 5 millions extra every year until 1927.³¹ To make this payments Mexico committed the total oil export taxes, the 10% tax on railroad profits, and the net earnings of the National Railways. All the sinking fund payments that Mexico was supposed to make were suspended until 1928. After 1928, the debt service was going to be resumed according to the original debt contracts.³²

If Mexico did not think there was anything to win from resuming payments, why would it go through the hassle of organizing such debt renegotiation? One could argue that the main objective of Obregón was to get recognition of the United States and that is

²⁹ Bazant (1995), p. 193.

³⁰ All the interests over those funds were actually waived. Thus interest and amortization funds in arrears amounted \$400 million pesos.

³¹ The annual payments would be paid part in specie and part in "scripts" payable in 20 years (with no interest for the first five years and an interest rate of 3% for the last 15 years). Turlington (1930), pp. 394–397.

³² The complete agreement can be found in Turlington (1930), appendix VIII.

why he worked so hard to solve the debt problem.³³ But if getting recognition had been the first priority, the Mexican government would have focused its diplomatic efforts on recognizing damages to American citizens done during the Revolution years and in negotiating the property rights provisions of the Constitution, which were crucial to gain American recognition.³⁴ Instead, Minister of Finance De la Huerta focused on renegotiating the debt in 1922, while the agreements on the property rights of foreigners had to wait until 1923. In 1923, Mexico and the United States created a commission to assess material damages done to American nationals during the Revolution and to allow Oil Companies operating before 1917 to keep their concessions, against the intentions of the 1917 Constitution. After the negotiation was over, the agreements, known as the "Bucareli Agreements," needed only the approval of Mexico's Congress to become law.³⁵

If the debt agreement was just for show, we would not expect Mexico to have paid about \$15 million dollars (\$30 million pesos) in 1922 for the first annual deposit of the debt agreement. Moreover, the IBC lent \$350 thousand dollars that Mexico was missing to complete the first payment. In 1923, the Mexican government apparently paid back the IBC and made another deposit to build a reserve for the payment of 1924. The Ministry of Finance sent the IBC \$700,000 dollars as a part of the second payment of the agreement, which was going to total about \$18 million dollars (\$35million pesos).

Political instability hit hard again at the end of 1923. In mid-1923 President Obregón had settled on General Plutarco Elias Calles to run as the official candidate for the presidential election of 1924. The followers of Obregón were divided with this decision and a large political group decided to support Minister of Finance De la Huerta for president. De la Huerta resigned in September and by December a group of the best army generals convinced him to rebel against the government. Fighting this rebellion proved a difficult task for the Mexican government. The government finally won once the "Bucareli Agreements" were signed by Congress. Only then, did the U.S. give

³³ This is, for example, the argument of Jan Bazant (1995), p. 199.

³⁴ The United States promised recognition of the Obregón presidency under three conditions. First a Mixed Claim Commission had to be created, the non-enforcement of the retroactive provisions of the constitution, and the recognition of the foreign debt. See Turlington (1930), p. 281.

³⁵ Zebadúa (1994), pp.136-137.

recognition to Mexico's government and sold a shipment of arms to the country on credit (See Figure 1).³⁶ The uprising cost the Mexican government about \$60 million pesos, almost twice the price of the debt service for the year 1924.³⁷

Right after defeating the De la Huerta rebellion, in February 1924, Mexico started negotiations with IBC for a loan that would help it finance the interest payments for the year of 1924. The loan requested was for \$20 million dollars payable in 5 years. The government offered all the oil production taxes as guarantee. Minister of Finance Alberto J. Pani, who substituted De la Huerta, later declared that the government was expecting a "happy ending" to the negotiations of this loan.³⁸

The hopes of getting a new loan were erased when the IBC rejected the loan proposal on the grounds that oil tax receipts were decreasing rapidly together with oil production. Then, the Mexican president refused to pay the amounts owed for 1924 and blamed the former Minister of Finance for the lack of funds. The 1922 agreements were officially suspended in June 30, 1924, until new funds could be devised to pay bondholders.³⁹ By the time the Mexican government cancelled the debt agreement, it had deposited \$1.4 million dollars in the IBC account in New York.⁴⁰

According to Haber, Razo, and Maurer (2003), this is the moment when it was optimal for the government to default on its foreign debt. However, the Mexican government was hoping new loans would come. In September of 1924, Minister of Finance Alberto J. Pani, contracted a loan with J.L. Arlitt, of Austin, Texas. The 6% loan of \$50 million dollars was going to be used to resume payments on the foreign debt for 1925 and to reduce the "floating" internal debt, which increased rapidly after the De la Huerta rebellion. The transaction was cancelled because J. L. Arlitt failed to comply with all the legal details of the loan.⁴¹

In august of 1925, Minister Pani announced the creation of a Sole Bank of Issue in Mexico, Banco de Mexico. The IBC complained about the establishment of this bank on the grounds that it was created with funds that were destined for the payment of

³⁶ Meyer (1991), pp. 132-133.

³⁷ Bazant (1995), p. 200.

³⁸ Pani (1926), pp.101-102.

³⁹ Bazant (1995), p. 200.

⁴⁰ Turlington (1930), p. 201, footnote 122.

⁴¹ Turlington (1930), p. 302 and Zebadúa (1994), pp. 261-262.

bondholders. Yet, the funds used to open the central bank came directly from the accumulated specie reserves of the Monetary Commission, the board in charge of regulating the gold standard in Mexico. This did not stop the International Committee from continuing the negotiations of a new debt agreement. In fact, new debt negotiations started in New York at the beginning of October.⁴²

The new debt agreement was signed in October 23, 1925 by Minister Pani and Thomas Lamont, of the IBC. The document added three main modifications to the 1922 agreement. First, it announced the deferment of past due interest and amortizations for 1924 and 1925, to annual payments beginning January 1, 1928 with a 3% interest rate. Second, the government "ceased to be directly responsible for the obligations of the railways." The interests in arrears of the railway debt were also deferred to 1928, with annual payments of \$2.5 million pesos for 39 years. Third, the railways were to be returned to private management at the end of 1925. The entire earnings of the railways were going to be used by the IBC to pay interests to the holders of railway debt. The agreement was approved by congress in January of 1926 and the railways were returned to private management then.⁴³

The 1925 agreement reduced the debt burden of the Mexican government significantly. From the \$1,561,438,348 pesos assumed in 1922, now the government took responsibility for \$890,201,892 pesos of debt. Also, following this reduction in the principal, the annual obligations of the Mexican government for 1926 and 1927 were reduced from \$45,000,000 and \$50,000,000 pesos to \$21,385,690 and \$22,023,802 respectively.⁴⁴ This allowed the government to make the 1926 payment in its entirety.

Thus, Mexico changed simultaneously its debt burden and the present value of the penalties imposed on it. In other words, Mexico provided foreign creditors another penalty to induce it to repay its debt. The National Railways were now controlled by its creditors and Mexico had guaranteed the payment of the railway debt using the net earnings of the company. In case the net earnings were not sufficient, the government was committed to pay from its own revenues. The interest of the government in making

⁴² Turlington (1930), p. 306.

⁴³ Turlington (1930), pp. 306-308, Bazant (1995), pp. 201-205

⁴⁴ Pani (1926), pp. 104-105.

sure the service of the railroad debt was met stems from the fact that the National Railways were bought with mortgage bonds. If the Mexican government or the company itself did not repay the bonds, there was the threat that the owners of the bonds could file for bankruptcy and repossess the lands guaranteeing the bonds (Bazant, 1995).

At the end of 1926, Mexico was paying its debt and had given its creditors a tangible asset to extract cash flows. Mexico had done its part of the deal so far. New loans should have been in the natural sequence of the game, or at least after a couple of years of try-out period. Unfortunately for the Mexican government, before new loans were offered, the political instability and deteriorating economic conditions hurt the country's public finances again.

In 1926, the Mexican government made the payment to the IBC in its entirety. It used all the export taxes and the oil production taxes, which each amounted \$10 million pesos. The payment for the year was exactly \$21, 219,000. Therefore, the government had to set aside revenues from other sources to complete the payment.⁴⁵

There were three forces that affected Mexico's capacity to pay in 1927 and forced it to suspend payments in 1928. First, the oil export tax revenues kept falling rapidly together with oil production.⁴⁶ Second, there was another uprising in October 1927 organized by Generals Serrano and Gomez, who opposed the re-election campaign of General Obregón. This rebellion forced the government to increase military expenditures. The government increased the size of the army and bought a new shipment of arms from the United States (see Figure 1). Finally, the Calles administration, started an open campaign against the Catholic Church in 1926. In January of 1927, the government's open criminal prosecution of priests generated a popular uprising in central Mexico. This uprising, known as the "Cristero War," took its toll on the 1927 budget too and the government ran a deficit for the first time since 1924. Moreover, military expenditures were kept relatively constant around \$85 million pesos, even when total expenditures

⁴⁵ The government also paid \$5.35 million pesos to the bearers of railways bonds guaranteed by the government. See Turlington (1930), p. 313, footnote 145.

⁴⁶ Contemporaries blamed the falling production on the "rapid exhaustion of flush oil production in Mexico, the necessity for operating wells at a lower rate, depression in the world oil market, a hugely increased yield in the United States, and competition with Venezuelan oil." See Schneider (1928), p. 88. Haber, Maurer, and Razo (2003), chapter 6 defend the exhaustion of wells as the main reason for the oil sector decline.

were falling (see Table 1). In 1928, total military expenditures were budgeted at above 30% of government expenditures for the first time since the De la Huerta rebellion.⁴⁷

In 1927, it was clear Mexico was not going to make the full payment of interests due for the year. Oil revenues fell short of expectations and with more pressure to pay for military expenditures it could not divert resources to make the debt payments. Moreover, the National Railways were not in good shape either. At the end of the year, the government had to borrow \$6 million pesos from the IBC to meet the 1927 annual payment.⁴⁸

In 1928, Mexico had to resume payments on the sinking fund of the debt and the government signaled it was not ready to disburse the \$70 million pesos due in that year. Mexico, once more, requested the IBC a new negotiation to reschedule debt payments (Turlinton, 1930, p. 314). To make matters worse, the president-elected for the 1928-1932 term, once again General Obregon, was assassinated in July, 1928. As a consequence, some of the generals loyal to Obregon rebelled in that same year and Mexico continued to perpetuate the cycle of political instability and violence. The government budget for 1929 had to include an increase in military expenditures to 33% of the total expenditures (reaching \$90 million pesos per year).

The opportunity of the 1920s was lost with the advent of the Great Depression and the contagion of defaults in Latin America. The debt game was never going to be the same for foreign creditors and Latin American countries. Mexico reached a new debt agreement in 1929, but had to cancel it because of the effects of the Depression. This country continued the cycle of negotiations until it reached a definitive agreement in 1946.⁴⁹

IV. Mexico and its foreign creditors

Defaulting as the optimal strategy? Mexico in the eyes of bondholders

If defaulting was the optimal strategy for Mexico and if bondholders believed Mexico was not going to repay, then we would not expect to find bondholders reacting to

⁴⁷ Meyer (1991), pp. 128, 149, and chapter 4 for the "Cristero War."

⁴⁸ The amount borrowed was repaid to the IBC in 1928. See Turlinton (1930), p. 313.

⁴⁹ Marichal (1989), p.213.

the different debt negotiations and announcements significantly. In this section we test this hypothesis using the quotations of Mexican bonds in London to study the reactions of investors when announcements of defaults were made.

We test our hypothesis looking for three possible major structural breaks. First, the strict version of the test would require that investors had discounted heavily the price of Mexican bonds (increased the implicit risk premium) at the beginning of the 1920s, once the armed conflict was over. Second, we would expect 1924 to be the date when investors did their major rediscounting of the price of Mexican bonds, just like Haber, Razo, and Maurer (2003) argue. According to their view, there were not enough penalties to force Mexico to pay after 1924. Therefore, investors should have perceived the Mexican government was not going to pay when they announced the suspension of the 1922 agreement in the summer of 1924. Finally, according to the narrative we have provided on the debt renegotiations, we would expect that investors actually thought Mexico wanted to pay, but were disappointed after they realized that because of the political instability the Mexican government had to default.

Figure 2 shows the graph of the estimated risk premium of the 1899 Mexican bonds quoted in London between 1910 and 1929. It is clear from this figure that creditors were reacting to different announcements and were changing their expectations from positive to negative throughout the period according to the actions of the Mexican government and the outcomes of the debt agreements.

The short-term jumps in the series plotted in Figure 3 are clearly responses to the Mexican government's announcements of resumption or suspension of payments. From eyeballing the data it is obvious that the suspension of the 1922 agreement had a strong effect on investors' expectations, putting the level of risk premium around a different mean. But, the 1925 agreement brought hope back and sent positive signals to investors, until political instability hit again in 1928 and Mexico did not deposit the annual payments for that year.

Table 2 shows the Chow breakpoint test for some of the most relevant events of this series. We truncated the sample to include only the period when Mexico was not making regular coupon payments, so we worked with the sample January of 1915 to December 1928. It is interesting to see that the only events that introduce significant

breaks in the series are the US recognition of the Carranza government in 1917 (allowing Mexico to negotiate a new loan with foreign bankers), the signature of the 1922 debt rescheduling agreement, and its suspension in June 1924. No other event introduces a significant break. This means that bondholders cared very much about the big events before 1924, but there was no major break in the series after the suspension of payments in 1924 using this method. This supports the idea that investors discounted Mexico's actions early in the decade. Yet, Chow breakpoint tests have been criticized in the literature because they allow small breaks to pass the F-test too easily (Hansen, 2001). So we carried out a Bai-Perron test to find the structural breaks in the series as it has been explained.

Through the Bai-Perron test methodology, we find that the only significant breakpoints took place in July 1917, October 1919, May 1924, and February 1927. As we have explained in 1917 the government of Venustiano Carranza achieved some stability and it started negotiations with bankers in New York early in that year. In July 1917 bondholders must have perceived that debt arrangements could be reached as the United States was about to recognize Carranza's government. In October 1919 bondholders must have again raised their optimism as the Mexican government unveiled plans to recognize its financial office in London and to resume interest payments on the foreign debt. The structural change in June 1924 is related with the negative effect that the suspension of the 1922 agreements of June 30, 1924 had on bondholders' expectations. Finally the break of February 1927 indicates that the optimism that the 1925 debt agreement generated collapsed when bondholders realized that the problems the Mexican government was facing would not allow it to comply with its debt payments. The oil export taxes fell short of expectations and it was clear the railroads were not going to make enough earnings to pay its bonds either. At the end Mexico borrowed \$6 million pesos from the IBC and the quotation of the bonds went up again (risk premium went down). The government went in default in 1928. This shows that investors were actually still reacting significantly to what was happening after 1925. They still cared about Mexico's actions and, at least before 1928, they reacted radically when Mexico's government did not meet payments.

What is impressive about the significant responses to announcements of the Mexican government in the late 1920s is that in London there were strong feelings against Mexico after the 1924 suspension of payments. In October of 1925, the *Investor's Monthly Manual*, published an editorial warning investors about Mexico's intentions (it was the only editorial about Mexico in the whole decade). The editorial explicitly asked for caution on the latest debt announcement and detailed the history of Mexico's sovereign debt until that year. It read:

Hope springs eternal in the investor's breast. But in regard to Mexico it has sprung so often only to fade away that the latest announcement with regard to the Mexican government's intentions must be read with sober caution.⁵⁰

So, we would have expected investors to react with "sober caution" in 1925 and 1926. Instead, the quotations of 1899 Mexican bonds went up from its July 1925 price of 35% of face value, to a level of 50% in June 1926. The risk premium estimates went down from 10.28% to 5.6% in the same period. Even though the risk premium of bonds was clearly at a higher plateau than in the first part of the decade, bondholders were optimistic about Mexico's actions.

These results imply first, that foreign bondholders did not believe Mexico was going to stay in default forever after 1914. Second, foreign bondholders certainly cared about the debt agreement of 1922 and discounted heavily the actions of the government when this agreement got suspended. Finally, the debt agreement of 1925 impacted the bondholder and, especially, when Mexico unexpectedly fell short of expectations to meet the 1927 debt payments. Therefore, there is no definitive evidence that defaulting in 1924 or earlier was discounted by investors as the only solution Mexico had to the debt problem. Investor's hope sprang for a few more years.

Foreign creditor's penalties on Mexico

If the Mexican government was so eager to renegotiate its foreign debt and resume payments, then it should follow that the penalty of being banned from foreign financial markets was very costly to this country. If there was no possibility of getting a new loan, then one wonders why the Mexican government went through the hassle of

⁵⁰ "Mexico and Foreign Investors" in *Investor's Monthly Manual*, October, 1925, pp. 558-559.

negotiating two debt agreements and making some annual payments. The Mexican government made payments only because they believed getting underwriting for new debt issues was feasible. We explore the implications of this hypothesis below.

According to the experiences of other Latin American economies Mexico should have been getting credit somewhat fast after resuming payments in the 1920s. Debt restructurings were a common occurrence in "emerging economies," especially in Latin America. Argentina rescheduled payments to its federal and provincial debts after the Barings crisis of 1890. In 1893, in what is known as the "Arreglo Romero," the Argentine federal government assumed all state debts, got a reduction of almost 30% in annual interest payments for 5 years, and suspended the amortization of the debt until 1898.⁵¹ Argentina got back to issuing new debt quickly in the 1890s. There is a bond issue as early as 1897.

Brazil also had two major debt restructurings before the Great Depression. In 1898, it got a loan to pay the interests of the next three years. This agreement also suspended the amortization of the debt for 13 years! The second restructuring came in 1914, when it got a loan to pay for the debt service. The deal included a suspension of amortization payments until 1927 and a suspension of interest payments until 1917.⁵² Brazil also got rehabilitated in world debt markets quickly. According to the *Investor's Monthly Manual*, in the 1920s alone, Brazil was the largest issuer of debt of all the Latin American economies (this includes sovereign, state, and municipal debts) (see Table 6). There are loans made to the state of Sao Paulo as early as 1921 and sovereign debt issues in 1927.

Most of the large economies in Latin America were issuing debt in the 1920s. As mentioned, Table 6, shows Brazil was the champion of new issues during the 1920s. This country, including state and municipal debt, issued almost £47 million pounds sterling of new debt between 1920 and 1929. Argentina and Chile placed new issues too, getting £3.5 million and £10.5 million pounds sterling respectively during the decade.

Mexico would have been a great candidate for a new debt issue in the 1920s. As Table 6 shows, according to the information provided to investors in the *Investor's*

⁵¹ Abreu (1999), p. 7

⁵² Abreu (1999), pp. 8-14.

Monthly Manual, Mexico was the country with the lowest debt burden per capita in the region. While Argentina and Chile had debt per capita ratios of over £10, Mexico had £4 pounds of debt per head. Brazil with its large population had slightly more than Mexico, with a debt per capita of £5.

Even though this is the information that investors observed, this data underestimates the debt burden assumed by the government in 1922 and overestimates it after 1925. The total debt assumed by the government, including state bonds and the railway mortgage bonds, amounted over \$1,500 million pesos (£145 million). If the population of Mexico was estimated at 15 million inhabitants, we would get a debt per capita of less than £10. This would put Mexico still below Argentina and Chile, according to Table 6. After 1925 Mexico's debt burden would have been reduced by almost one half, therefore lowering Mexico's debt per capita even more.

In Table 7, we show a comparison of Mexico with a broader cross-section of countries. The data compiled by Turlington (1930) compares Mexico in 1925 with Argentina, Belgium, Brazil, Chile, France, Great Britain, Italy, the Netherlands, Norway, Peru, Spain, and the United States. We included the two scenarios Turlington (1930) works with, one in which Mexico has a debt of \$1 billion pesos and another in which Mexico assumes the payment of reparations to American citizens caused by the Mexican Revolution (amounting \$2 billion pesos). In the first case the debt per capita of Mexico is the lowest of all nations included. Even if we assume Mexico was going to pay reparations to foreigners we would get a debt per capita of about £13 pounds or 133 pesos, an amount that still looks smaller than most countries (except Brazil and Peru).

If we look at the budget deficits reported in the *Investor's Monthly Manual* we would find Mexico was not the worst borrower. Table 5 shows the budget deficit or surplus reported by this publication between 1917 and 1928. According to this data, Mexico did not look that bad compared to Chile and Argentina. In fact, when we look at the actual data reported by the Ministry of Finance to the IBC (presented in the last column) we see that Mexico was in better shape than Argentina and Chile, with the exception of 1923 and 1924 (when fighting the De la Huerta rebellion put a severe toll on Mexico's finances).

According to the debt agreements Mexico reached, the debt burden to the government did not look high compared to other countries. When we look at the debt service proposed by Mexico in the 1922 agreement and the actual payments made throughout the 1920s, we can see that the debt burden of Mexico was about 15% of revenues for most years, reaching 16% in 1927. The internal debt increased the debt burden, but most of this increase was the product of the short-term debt contracted to fight the De la Huerta rebellion in 1923–24.

Mexico's proposed debt service was not that large compared to data for other countries around 1925. According to the data presented in Table 7, most countries used 30% of their revenues to pay the debt service. In Latin America, only Chile and Peru paid less than 30% of revenues for interests and amortization, and they still had larger debt burdens than Mexico. In Table 4, we can see that the annual payments of Mexico for 1925-1928 were less than 20% of revenues.

In sum, Latin American countries that did debt restructurings like Mexico's usually got loans to rehabilitate the country. Also, many of these countries were issuing debt in the 1920s, after debt renegotiations similar to those of Mexico. Most of the borrowers had higher debt burdens and worse government expenditure profiles than Mexico. Then, one wonders why Mexico did not get a new loan during this decade.

In fact, Mexico's profile was tempting for some creditors. The country received money during the 1920s in small amounts and received offers for larger amounts. There was a loan offer in 1925 from J.L. Arlitt, of Austin, Texas and an actual loan of £1.15 million pounds from the Loan Bank.⁵³ More loans were not obtained, because they depended on the underwriting of the members of the IBC. So, the game was all about credibility *vis a vis* the IBC and credibility is something Mexico could not build during the 1920s. As we have mentioned before, the IBC represented over 90% of the Mexican debtholders.⁵⁴ The committee included some of the most influential New York Bankers, such as J.P. Morgan, Kuhn Loen and Co., National City Bank, and Chase National Bank.

⁵³ Reported in "Mexico and Foreign Investors" in *Investor's Monthly Manual*, October, 1925, p. 559.

⁵⁴ Turlington (1930), p. 299. This is the number of bondholders that deposited their titles on the 1922 debt agreement was signed. But Mexico had previously agreed to negotiate external debt issues only with the IBC.

⁵⁵ Therefore if there was a syndicate of banks that could help Mexico to get a new loan, it had to be formed from within the members of the IBC.

Instability, then, hindered the capacity of the Mexican government to commit to pay its foreign debt and convince the IBC to provide a new loan. The Mexican government's difficulty at generating a cash flow to pay the debt service was to a large extent related to the increase in military expenditures that were necessary to deal with instability. During the pre-revolutionary period the debt burden was always close to 20% of revenues and military expenditures were also around 20% of expenditures (see tables 1 and 4). During the 1920s, after the civil war was over, the share of military expenses increased to above 25% of total expenditures, reaching 30% in most years. Ad figure 1 shows export of arms and munitions from the United States to Mexico kept higher throughout the 1920s than they were in the pre-revolutionary period.

In table 4, we can see that had there not been rebellions, such as that of 1923, the money necessary to make foreign debt payments would have been met more regularly. For example, the \$60 million pesos that the government had to spend to fight the 1923 rebellion, would have paid the 1924 interest payments (\$40 million pesos) and would have helped to make the 1925 payment (of \$45 million pesos). Also, if the Mexican government had been able to pacify the country during the 1920s and reduce military expenses to around 15% of the budget, as Minister of Finance Pani intended, then Mexico would have been able to divert at least \$40 million pesos (half of the military expenditures) to make debt payments every year. But, instability did not allow the Mexican government to reduce military expenditures and it had to suspend payments three times during the 1920s.

We believe the evidence shows that Mexico could not get out of the financial difficulties generated by instability, because it was not able to get a large loan that could help it to reorganize the public finances, resume debt payments, and show coercive power to deter any new rebellions. Our counterfactual is that it would have been easier for Mexico to show a credible commitment to foreign creditors if it had not been for the extraordinary expenditures the government had to make to fight rebellions. If the

⁵⁵ Turlington (1930), appendix VIII contains the full list of members.

government had been able to make debt payments in time, Mexico probably would have been able to take advantage of its low debt burden and positive outlook to issue new debt.

V. Conclusion

We developed an argument of how political instability affected the capacity of the Mexican government to obtain new loans and regularize its expenditures pattern. After the Revolution the Mexican government had to spend on average more than 30% of total revenues on the Ministry of Defense and Navy. Moreover, the increases in the expenditures to fight rebellions did not allow Mexico to repay its foreign debt service continuously for more than two years over the whole 1920s. Even when different administrations did an arduous diplomatic work to build credibility in international financial markets, political instability hindered the efforts to show the commitment to repay the debt in practice.

Investors in London did not discount defaulting before 1924 as the only option of the Mexican government. They reacted positively to every debt renegotiation of the Mexican debt. Also, we found that events that forced Mexico to suspend payments had terrible negative effects. We show that the most important breaks in the series came at the end of the 1920s and not before 1924 like the literature argues. Most of the big disappointments to investors came when instability led Mexico to suspend payments. This usually happened when political instability put pressure on the government to increase military expenditures instead of paying the debt service.

Revolutions can have long-lasting effects when it comes to reorganizing the government finances and the political life of a country. In the case of the Mexican Revolution, the rapid growth of the demand for mineral products, oil, and other commodities helped Mexico to grow faster in the 1920s and 1930s than in the pre-revolutionary period. However, we hope our argument convinces the reader that if the Mexican government finances had not been hit so hard by political instability between 1914 and 1929, Mexico would have achieved even higher rates of growth after the Revolution.

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Tables and Figures

**Table 1. Mexican Government Revenues and Expenditures
(Million Current Pesos)**

Mexican Government Revenues and Expenditures (Million Current Pesos)

	Revenues	Expenditures	Surplus or Déficit	As a % of Revenues	Ministry of War and Marine (% of Expenditures)	Taxes paid by the Oil industry (as % of Revenues)
1910	106	95	11	11%	20%	
1911	111	101	10	5%	20%	
1912	212	202	10	6%	0%	0.23%
1913	164	153	10	6%	19%	0.47%
...						
1918	146	179	-32	-22%	72%	8%
1919	131	203	-73	-12%	66%	13%
1920	251	213	39	15%	62%	20%
1921	280	271	-5	-2%	57%	22%
1922	261	384	-122	-47%	0%	34%
1923	264	348	-84	-32%	36%	24%
1924	284	298	-14	-5%	36%	19%
1925	337	292	45	13%	32%	14%
1926	329	329	0	0%	29%	13%
1927	307	310	-3	-1%	32%	8%
1928	311	287	23	8%	34%	6%
1929	322	276	47	15%	37%	6%
1930	289	279	10	3%	31%	8%
1931	256	226	30	12%	30%	9%
1932	212	212	1	0%	29%	11%
1933	223	246	-23	-10%	25%	13%

Source: Data for 1910-1912 from Mexico. INEGI. *Estadísticas Historicas de Mexico*, INEGI, Mexico, 1991. Data for 1911-1913 from Turlington (1930), Appendix I. The estimates for 1918 revenues and expenditures, 1919 expenditures, 1920 revenues and expenditures, and 1921 expenditures were taken from *The Mexican Year Book 1920-1921* pp.323-326. Data for 1919, 1921 and 1922 revenues and on the taxes paid to the oil industry come from Meyer (1981), p.35. Data on expenditure for 1922 comes from Gilly (1987), p.55. From 1923 to 1925 data from Pani (1926), pp.163-188, 1926 from Sterret and Davis (1928), pp: 50, 60, 255. From 1927 on data from México, Secretaría de la Estadística Nacional, Departamento General de Estadística, *Anuario Estadístico de los Estados Unidos Mexicanos 1938*, México:DAPP, 1934, pp.280-281.

Table 2. Chow Breakpoint Test (Sample 1915-1928)

Date	Event	Structural Change	Likelihood Ratio Test	Chi-square p-value
Feb-17	New Constitution	No	4.3	0.118
Apr-17	Government Announces Mexico will pay	No	3.7	0.158
Aug-17	US Recognizes the Government of Carranza	Yes (at 10% sig)	4.9	0.086
Aug-20	General Obregon's Rebellion	No	0.8	0.674
Apr-22	First Formal Debt Re-Negotiation Agreement is signed	Yes (at 10% sig)	5.6	0.062
Dec-23	De la Huerta Rebellion	Yes	10.5	0.005
	The 1922 debt agreement is suspended by the			
Jun-24	Mexican government	Yes	11.1	0.004
Jan-25	Central Bank of Mexico is created	No	4.6	0.100
Dec-25	New Debt Agreement is approved	No	3.4	0.183
Jan-27	Cristero War Starts	No	1.1	0.586

Note: OLS estimations run with $\ln Y_t = a + B_1 \ln Y_{t-1} + B_2 \ln Y_{t-1} * \text{EVENT}_{\text{long}} + E_t$, where $\ln y_t$ is the logarithm of the risk premium in period t , and $\text{EVENT}_{\text{long}}$ is a dummy variable that multiplies $\ln y_{t-1}$. The variable $\text{EVENT}_{\text{long}}$ has a value of zero until the moment of the event we select ex-ante according to historical research and it takes the value of one thereafter. The estimates have heteroskedasticity-consistent errors with no detectable serial correlation. We could not find significant breakpoints for any other events, even if they are not included in this table.

Table 3. Bai-Perron Test

Sample 1914-1929

Sup F(1)	Sup F(2)	Sup F(3)	Sup F(4)	Sup F(5)
20.64	15.96	8.341	9.3106	8.4677
Sup F(2 1)	Sup F(3 2)	Sup F(4 3)	Sup F(5 4)	
0.7	0.8	0.23	0.0004	
Dates of Structural Changes				
BIC: 4				
Jul-17	Oct-19	May-24	Feb-27	

Table 4 Foreign Debt Service of the Mexican Government, 1901-1928

	Interest					External Debt Service	Total Debt Service	External Debt Service Under 1922 agreement	External Debt Service Under 1925 agreement
	Actual Foreign Revenues	Debt Service Made	Payments in the Government's Budget	Under 1922 agreement	Under 1925 Agreement				
	Million Pesos					As a % of Revenues			
1901	63	14				22%			
1902	66	17				25%			
1903	77	16				21%			
1904	87	15				18%			
1905	93	16				18%			
1906	103	18				17%			
1907	115	18				16%			
1908	112	22				19%			
1909	99	26				26%			
1910	106	27				26%			
1911	111	27				24%			
1912	212	25				12%			
1913	164	26				16%			
1914-1922	0	0							
1923	264	30	41	30		11%	16%	11%	
1924	284	1.4	72	35			25%	12%	
1925	337	0	84	40			25%	12%	
1926	329	21.385	50	45	21.385	7%	15%	14%	7%
1927	307	22.023	57	50	22.023	7%	19%	16%	7%
1928	311	0	34	140	70		11%	45%	23%

Sources: For Revenues and actual debt service for the 1920s same as Table 1. Debt Service before 1910 from Zabludowski (1984), p. 204. Payments under the 1922 and 1925 agreement are estimates mostly taken from Turlington (1930).

Table 5**Deficit or Surplus as a % of Revenues in other Latin American Countries
(According to the Investor's Monthly Manual)**

	Brazil	Chile	Argentina	Mexico (IMM)	Mexico Actual
1917		10%			
1918		11%	-41%		-22%
1919	53%	-47%	-16%		-12%
1920	39%	-20%	11%	-0.4%	15%
1921	26%	-4%	-13%	-34%	-2%
1922		1%	-9%	4%	
1923		-22%	-4%		-32%
1924	15%	24%	3%		-5%
1925	14%	24%	0.12%	-2%	13.3%
1926	31%	-11%	-0.11%	3%	0.03%
1927	22%	0.4%	-11%	-6%	-1.0%
1928	24%	2%	0.12%		7.56%

Source: *The Investor's Monthly Manual*, 1920-1929 and Table 1.

Table 6**Total Debt Quoted in London and Debt Per Capita in the Largest Latin American Economies**

	1929	1920	1914	1910
MEXICO				
Total debt quoted	£60,700,000	£60,700,000	£60,700,000	£40,700,000
Population Reported	16,290,000	15,115,612	14,855,000	13,607,259
New issues per period	£0	£0	£20,000,000	
Debt Per capita	£4	£4	£4	£3
ARGENTINA				
Total debt quoted	£105,634,298	£102,118,851	£96,166,107	£89,956,507
Population Reported	10,616,814	8,284,266	7,467,878	6,489,000
New issues per period	£3,515,447	£5,952,744	£6,209,600	
Debt Per capita	£10	£12	£13	£14
BRAZIL				
Total debt quoted	£178,624,020	£131,646,520	£123,646,520	£110,246,520
Population Reported	36,870,962	27,473,579	23,070,969	19,910,646
New issues per period	£46,977,500	£8,000,000	£13,400,000	
Debt Per capita	£5	£5	£5	£6
CHILE				
Total debt quoted	£51,624,092	£41,097,592	£41,097,592	£29,475,492
Population Reported	4,004,014	3,870,022	3,459,951	3,248,224
New issues per period	£10,526,500	£0	£11,622,100	
Debt Per capita	£13	£11	£12	£9

Source: *The Investor's Monthly Manual*, 1920-1929.

Note: Total debt and new issues include sovereign, state and municipal debts (called "foreign corporations" in the *Investor's Monthly Manual*) of these countries.

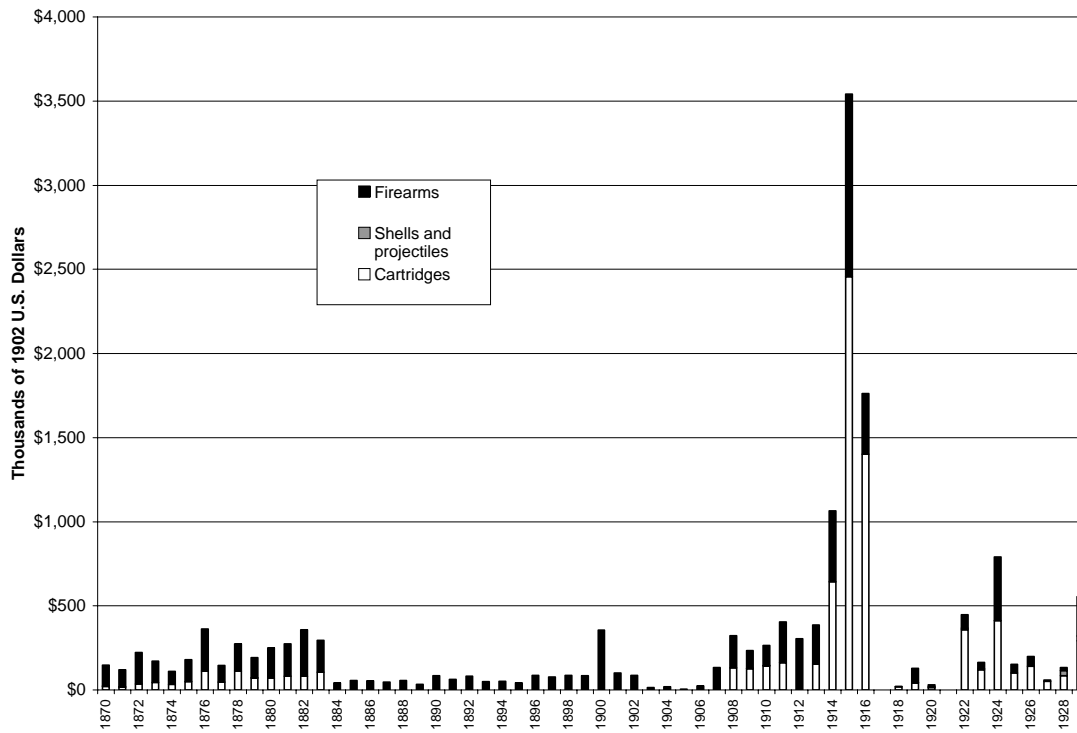
Table 7
Debt Burden in Selected Countries According to the League of Nations

Country	Amount of Debt in million pesos	Debt Per Capita	Annual Debt Service in Million Pesos	Debt Service as a % of Normal Revenues
Argentina	2180	218	156	30%
Belgium	4278.5	549	238	41%
Brazil	2681.4	88	96	35%
Chile	831	208	60	24%
France	37742	902	1253	40%
Great Britain	76337	1608	3114	40%
Italy	5172.1	127	308	36%
Netherlands	2405.4	324	106	20%
Norway	730.76	261	40	29%
Peru	224.3	49	18	21%
Spain	5050	230	226	30%
United States	39300	340	1500	19%
Mexico (2 billion)	2000	133		
Mexico (1 billion)	1000	66.7		

Source: Turlington (1930), p. 335. Original data from the League of Nations, converted to Mexican pesos by Turlington at the exchange rate of 10 pesos per pound.

Note: The two scenarios for Mexico represent an approximation of the debt burden after the 1925 agreement (1 billion pesos) and an estimate of the total debt of Mexico if the country were to pay for reparations on damages to foreign citizens caused by the Mexican Revolution.

Figure 1. Exports of Firearms from the United States to Mexico



Sources: United States, Department of Commerce. Bureau of Foreign and Domestic Commerce (1904-1911 Department of Commerce and Labor, before 1904 Treasury Department, Bureau of Statistics) *The Foreign Commerce and Navigation of the United States*. Washington: GPO, 1870-1929. Note: Deflated using the *Cc126 wholesale price index* in Susan B. Carter [et al.] ed. *Historical statistics of the United States [electronic resource]*. Millennial ed. Cambridge [England] ; New York : Cambridge University Press, 2006.

Figure 2. Risk Premium Implicit in the 1899 Mexican Bond Quotations in London, 1901-1929.

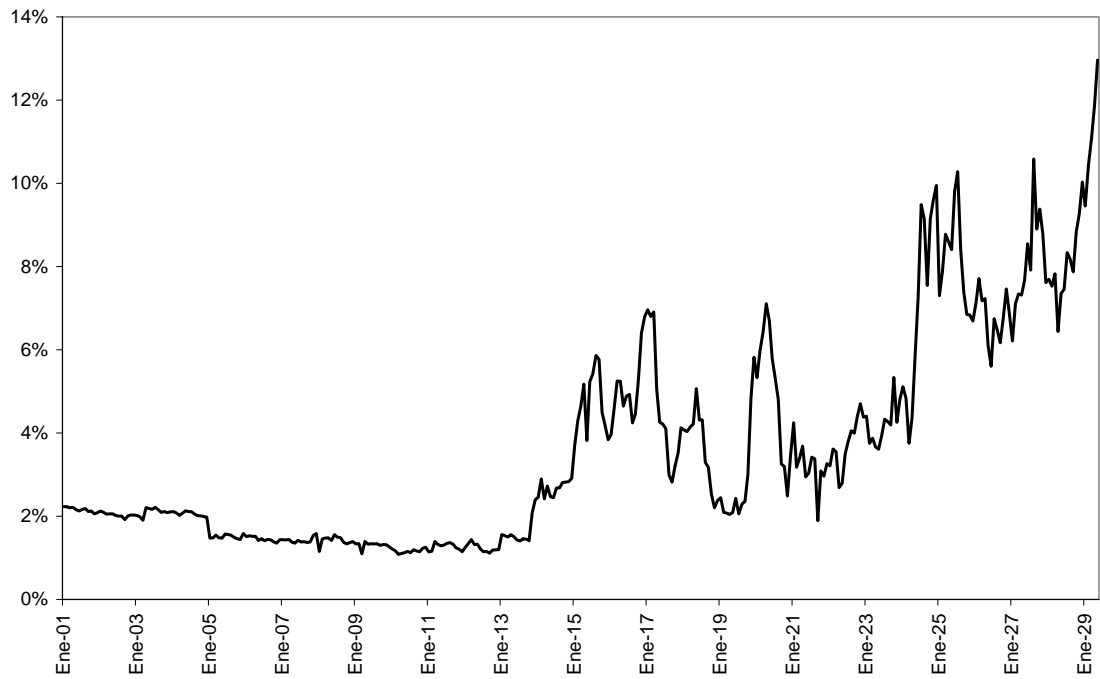


Figure 3. Monthly Risk Premium of the Mexican Bonds and Relevant Events, 1910-1929.

