

# A Century of Foreign Investment in Mexico

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## I. Introduction and Overview

This paper studies the evolution of foreign investment in Mexico during the twentieth century. The goal is to provide a quantitative description of the evolution of this variable, calculating measures that permit comparisons across time and with other countries in Latin America and the rest of the world. In general, the primary interest is on foreign direct investment. The broader context of the work is an effort to understand the conflicting pressures of economic change and government policy on the size of investment, and the major result of this exercise is to downplay political change, because the outline of the Mexican experience is rather similar to that of other Latin American countries during the period analyzed. The story for Mexico is of special interest because in so many ways this country has been on the leading edge of change for the region. This paper should be considered a continuation and updating of my previous work. On a conceptual basis, greater attention is here paid to free standing companies. The empirical updating involves closer attention to several estimates specifically generated for Mexico, and better use of the results of the capital stock estimates of André Hofman. To facilitate readability, most of the details about data sources are relegated to the Appendix.

### Conceptual Issues

It will be useful to define the major terms: foreign investment (FI) is the sum of foreign loans and foreign direct investment (FDI). The latter involves foreign control of productive activities in the host economy. Loans or portfolio investment are inherently more unstable than FDI, so that variations in them tend to be associated with balance of payments crises. Although this distinction between loans and FDI is the standard one in the literature, it has been argued that it was more appropriate in the middle of the twentieth century than either at the beginning or at the end of that century.

An important advance in understanding FDI was the introduction of the idea of free standing companies in Wilkins (1988). Her standard example was a firm registered in England (or Scotland) to do business overseas, which had been developed overseas by British promoters using funds from Britain, but had not grown out of domestic operations in Britain. Such firms had components of direct and portfolio investment; the directors were foreigners in the country of operation, but the firm's financing was through bonds. Wilkins highlights the contrast with foreign direct investment on an American model which involved the expansion overseas of activities originally developed in the home market, as one would associate with firms such as General Electric or Ford Motor Co. The free standing companies proliferated before World War I, and were initially viewed as characterizing a brief phase in the development of overseas activity. This literature is conveniently summarized in Ch. Jones (1995), who extends the revisionism to include a third category, business groups. Subsequent research reported in Wilkins and Schröter (1998) has demonstrated that this form of business also characterized foreign investments from other European countries, and that not all free standing companies were short lived. We will comment below that some U.S. dominated railroads in Mexico also fit this description.

A further variation on the direct/portfolio distinction is the evolution during the 1990s of foreign portfolio equity investment. As discussed in the appendix, this involves purchases from overseas of stock in a country's enterprises, in amounts not likely to give the investors

control.

Our principal focus will be on the level of the stock of the various aggregates of foreign investment, rather than in the annual flows. In some cases stocks have simply been measured as the sum of annual inflows. In other cases the stock of FDI is taken from economic censuses, wherein the underlying data is built up from the annual flows, with occasional special efforts taken to account for depreciation or inflation. The major effort of our work will be to compare the value of the stock of FI or FDI to some measure of the size of the local economy, for which the standard indicator is GDP. In some cases capital stock (K) data is available or can be estimated, leading to the use of FDI/K as an important indicator of the relative size of foreign direct investment. To avoid confusion in the use of these two measures, attention is drawn to the arithmetical identity  $FDI/K = (FDI/GDP)K/GDP$ , where  $K/GDP$  is the capital output ratio. Because of this identity, FDI/GDP will move in the same direction as FDI/K if the capital output ratio is relatively constant. Now, the range of the (average) capital output ratio is between 1.5 and about 4, depending on the inclusiveness of the measure of capital. It turns out that economists and economic historians have not had much success in explaining changes in the capital output ratio, as the presumably inexorable tendency for capital deepening is often overwhelmed by sectoral shifts toward less capital intensive activities.<sup>1</sup> As discussed below, for many reasons data on the ratio FDI/K would be preferred. However, because of the greater scarcity of data on capital stock, we will frequently rely on the measure FDI/GDP as a proxy for the preferred FDI/K.

### **Theoretical Evaluations of Foreign Investment**

The standard approach for market-oriented economists who study foreign investment is to consider it as a movement of an economic resource from an area of low returns into one of higher returns or profits. From this theoretical perspective, either direct or portfolio foreign capital flows are viewed as beneficial to its owners, as well as to society at large in the receiving countries. Furthermore, in both sending and receiving countries FI will lead to changes in the distribution of income. Additional benefits to the host country would occur if technology is transferred to the local factors of production. Turning to the distinction between loans and FDI, economic theory explains the latter in terms of factors associated with international industrial economics. Specifically, FDI inflows might arise from the development of a new technology in the source country, a lessening of some sort of cost of communication, or the relaxation of controls in the host or sending economy. These rather antiseptic terms may inadvertently hide stronger factors such as political control or tariffs favoring one national group over another, and policies holding down wages in the host country. In contrast to the case for portfolio flows, interest rates play a small role in the determination of FDI flows. Again at a theoretical level, FDI is a response to market imperfections, and will tend to reduce the special benefits (rents) earned by the artificially scarce factors. This is the implicit model of those who see the recent expansion of FDI into Mexico as proof that a more open, free market approach will generate the many benefits of globalization.

A similarly automatic response by a market-oriented economist to FDI flows would be that

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<sup>1</sup> Data on capital output ratios from Hofman (2000) and King and Levine (1993).

if and when they arise from government promotional policies (tax rebates, subsidized loans or land purchase prices, or artificially low wages), then the FDI does not necessarily help the host economy. Railroads are a prime example of a sector whose development received substantial subsidies. There are numerous studies in the economic history literature inquiring into the overall social benefits of railroads—the landmark one for Mexico is Coatsworth (1981). The subsidy issue requires an analytically sophisticated analysis when it is asserted that FDI brings positive spillovers, such as the spread of the presumably new technology, the growth of supplier firms, a better trained work force, and so on. Empirical work supportive of such a position for contemporary Mexico is contained in Blomström (1989); a more skeptical position is outlined in Hanson (2001).

There is a strong tradition in many parts of the third world, especially in Latin America, of viewing FDI with hostility, interpreting it as the imposition of strong foreigners on the local economy. This viewpoint can be seen as underlying the Dependency Approach, and motivated and explained policies of many countries in the region, with Mexico being a prime example. Such a view of FDI has not been limited to anti-capitalist, marxist-influenced analyses. Many contemporary political scientists view it in this way, following the lead of Raymond Vernon—*Sovereignty at Bay*. Incidentally, such a view has many followers in Canada. More generally, political scientists have fruitfully analyzed government policies toward FDI as subject to a benefit-cost calculus.

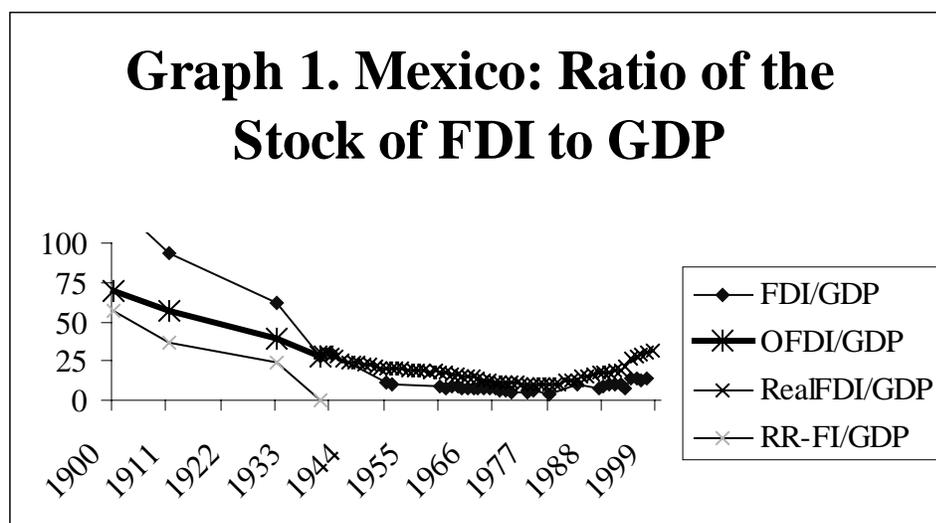
## II. Mexican Data

Mexico's century long experience with foreign investment is presented in Table 1. The dominant pattern was that both FI and FDI declined after the first decade of the century, continuing to fall relative to GDP into the 1960s.<sup>2</sup> At the end of the century the level of FI/GDP was perhaps one quarter less than it had been at the start of the century, while that of FDI/GDP was about half that of its peak in 1910. This result, which shall be referred to as the U-shaped pattern of FI or FDI, is the point of departure for the subsequent data analysis. Graph 1 displays the overall trends. In the Appendix we discuss in some detail the data on FI and its components, commenting on the sources and their reliability.

Some observations about the composition of foreign investment help enrich the primary result. The railroad sector was the single most important recipient of foreign investment at the start of the century, and that foreign participation had virtually disappeared by 1938. This was the most important contributor to the decline in FDI/GDP, although even our measure of FDI outside of railroads, OFDI, also followed a U-shaped path. Furthermore, in 1900, foreign loans to the government were of a secondary order of magnitude, as a result of the very strenuous efforts of the regime to balance its accounts in order for it to be able to re-enter the international capital markets. It was only after about 1960 that loans to the government were the primary cause of the increase of the ratio FI/GDP. Loans to the private sector after 1970 were never large compared to GDP. Finally, during the last decade of the century, Table 1 also indicates how the eruption of portfolio equity investment also contributed to the increase in FI/GDP.

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<sup>2</sup> See the similar results of the doctoral dissertation of David Glass presented in Whiting (1992, 31).

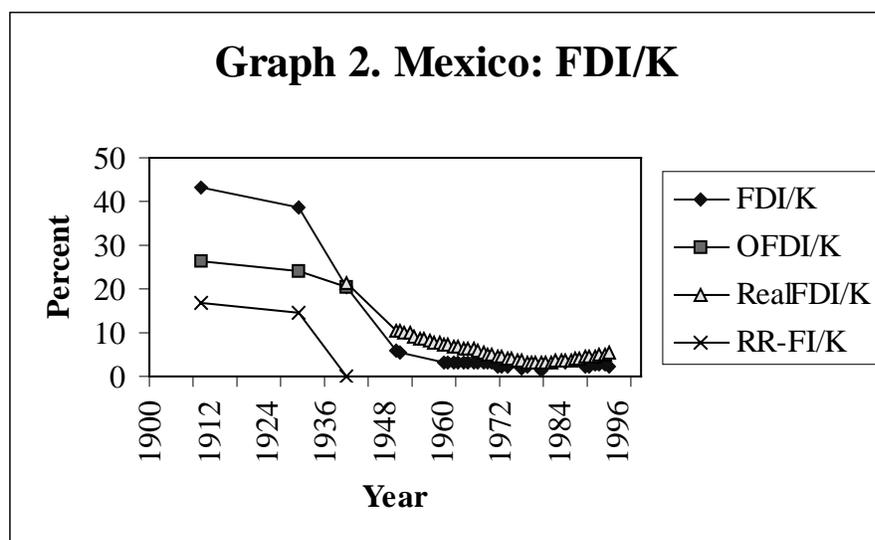


One potential criticism of the use of this data is that it does not take into consideration inflation. Use of the ratio FDI/GDP will lessen the distortionary impact of price changes. Moreover, with regard to GDP and the capital stock, there are well known adjustments which have been incorporated here. However, no such adjustment is widely used for data on accumulated FDI, so that the stock may be undervalued after periods of inflation. Our table has included a measure of the inflation adjusted value of FDI labeled RealFDI--which is calculated for the period after 1938 when annual data on FDI inflows become available, using a simple methodology which is explained in the appendix. The Table indicates that the U-shaped path of real FDI/GDP is moderated somewhat.

Another mode of presenting these data on foreign investment is to compare them to estimates of the capital stock. Table 2 indicates that there was a continuous downward movement in the ratio FDI/K during most of the century. This finding is independent of the measure of K--net or gross, with or without residences. The order of magnitude of the FDI inflows during the second half of the 1990s would suggest that the values of FDI/K have only very recently begun to increase. Thus there is no U-shaped pattern of foreign ownership for the economy as a whole. Graph 2 renders the visual depiction of our finding that foreign ownership ratios were very much lower at the end of the twentieth century than at its start.<sup>3</sup> The different movements of FDI/GDP and FDI/K are explained, in the arithmetical sense mentioned earlier, by the increase in the capital output ratio after mid-century.<sup>4</sup>

<sup>3</sup> This finding did not correspond to my initial hypothesis. One's intuitive feeling that the foreign presence in Mexico increased during the second half of the twentieth century might still be supported by an examination of the fraction of the country's employment or output controlled by foreigners.

<sup>4</sup> Hofman (2000, 94) found that the tendency for capital output ratios to increase after 1950 was general for the six Latin American countries he analyzed, by an average of 33 percent over the nearly five decades.



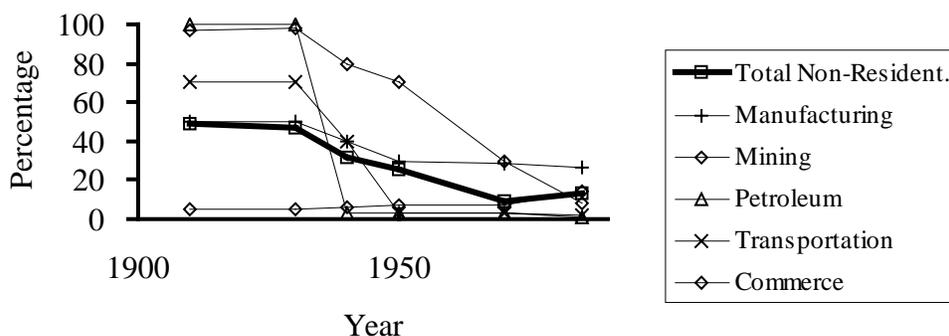
It may be useful to review the data on the geographical sources of FDI in Mexico. There is a significant change in the distribution before and after the Revolution, as shown in Table 3. Before the Revolution, the US and the UK were nearly equally important in terms of the size of investment. Afterwards, the USA has been the dominant source of FDI, reaching a maximum proportion at over eighty percent in 1960, subsequently declining to a current level of sixty percent. Because of international capital mobility it is difficult to identify the ultimate sources of loans, although conventional wisdom also identifies the U.S. as the principal source. Before the Revolution this role was shared with the U.K. and France. The explanations for these changes are familiar and can be summarized briefly. Although the United States was the world's biggest borrower in 1913, it already had begun investing abroad, predominantly in its local neighborhood--Canada, Mexico and the Caribbean. Similarly, the U.K.'s financial commitments abroad had already begun to decline in relative terms, and in particular its third world activities became progressively more limited to its colonies during the first half of the century. The financial presence of the French was even more short-lived.

The sectoral disaggregation of FDI is presented in Table 4. Before the Revolution, the two most important sectors for FDI were railroads and mining. Foreign investment in petroleum was just beginning before the outbreak of the Revolution, and then was eliminated through the famous nationalization in 1938. Manufacturing only becomes important in the 1960s. More recently, investment in certain services has risen sharply. We leave the discussion of the individual sectors for a subsequent section of this paper.

The data on FDI and capital stock can be utilized to rough out a picture of foreign ownership rates by sector in the Mexican economy. This is presented in Graph 3. Although the underlying capital stock data are not good, there are two important messages: foreign ownership ratios differ widely between sectors, and the time-trends of those sectoral ownership rates also have followed different paths.

### III. Comparisons with Other Third World Areas

Graph 3. Mexico: Foreign Ownership of Capital



One way to evaluate the Mexican experience is to compare these results with those of other countries. This exercise will be performed in two phases, in which the first set of comparisons refer to other Latin American countries, and the second refers to other parts of the Third World.

With regard to Latin America, Table 5 provides some indicators with which to rank the Mexican experience. First of all, Mexico's U-shaped patterns of FI/GDP and FDI/GDP were similar to those of the Latin American average, with Mexico's curvature being somewhat more exaggerated than that of the average for the region. Secondly, Mexico's overall level of FI/GDP starts off below that of the average, and ends up higher than the average. This results from the pre-WWI level of foreign loans in Mexico starts being significantly smaller. The vision of the Mexican data being close to the regional average is particularly notable in Table 5's series of OFDI/GDP. The most notable countries with higher levels of FI/GDP were Argentina, Chile and Uruguay. The Argentine case is particularly dominated by foreign loans to the government and the railroads; the turn of the century foreign investments in her railroads made her an outlier, and the country remained so longer until this sector was purchased by the Perón government at mid-century. That Colombia had low levels of FI and FDI is not surprising, but this author was intrigued to see that Brazil also was considerably below average. Finally, mention can be made of the increase in the relative size of foreign investment in Cuba for the first three decades of the century, making that country the most striking exception to the U-shaped pattern more common in the region.

Having seen that railroads were the most important sector for foreign investment in Mexico, it may be of interest to compare the size of railroads in the Mexican economy to that of other countries. The year chosen for the comparison is 1913, before the Great War and also before the spread of motor vehicles. Table 6 shows that the relative size of Mexico's system was only a bit above the average for the Latin American countries. Once again the option of deflating by either population or GDP changes some countries' rankings considerably, such as for Brazil, Chile, Cuba and Uruguay, although not Mexico. Pursuit of this line of inquiry is discouraged by the different paths taken in the countries of the region by the breakdown of ownership of railroads along foreign/private/government. Of interest to some readers will be the indications in Table 6 that the process of *ferrocarrilización* was much more advanced in Latin America than in

other third world areas, while the high levels of RRkm/person in Australia and Canada seemed to be correlated with those countries= higher levels of GDP/person, and hence lower levels of RRkm/GDP.

The perspective gleaned from analyzing FI and FDI compared to GDP is, I believe, quite different from the usual view about the size of foreign investment in Mexico. There are at least three strands in the historical literature on FDI which are subject to revision. The dominant view asserts that there was a lot (or indeed *too much*) foreign investment in Mexico before the Revolution. Many who accept that view also are happy that FI decreased subsequently. Secondly, others point to the allegedly large amounts of investment in places like Canada and Argentina, drawing conclusions about the favoritism of the British and their capital markets, and/or associating their high investment with their also readily observed high per capita incomes. These two views are fundamentally incompatible. The third example of a literature which reveals little willingness to adopt a standard for comparisons is that which trumpets the large amounts of FDI in countries like Mexico during the last decade or two of the twentieth century. This vision is particularly characteristic of the international organizations such as the World Bank and UNCTAD, but is not supported by the results in our Tables 1 and 5.

Turning our comparative lens to other third world areas requires separating two important sub-groups--colonies and independent countries. The Latin American countries were independent during the century; most of what are today referred to as third world countries in Asia and Africa were colonies before 1950. Counterexamples include China, Thailand, Ethiopia, and the remnants of the Ottoman Empire. The first two countries, as well as Egypt and Turkey were covered in Twomey (2000). Without detailing the numerous cases, there are three patterns which bear mentioning in the summary Table 7. There are important differences in the gradual U-shape of FDI/GDP which we saw above for Mexico and much of Latin America. First of all, the timing was different: the colonies of France, Japan, Belgium and the Netherlands experienced an acceleration of FDI during the entire period leading up to World War II. Even during the 1930s--and typically a rapid decline thereafter. That decline is readily associated with war damage to the imperial country as well as to the colony, and nationalist policies adopted by the post-independence regimes. The increase of FDI is probably best explained more by strengthened mercantilist policies in the metropolitan countries, especially as they prepared for the Second World War, than to a market based expansion of investment opportunities in the colonies themselves. Something similar happened to Britain=s colonies, although quantitatively the largest expansion of FI and FDI occurred in what are called the self-governing colonies--Canada, Australia, New Zealand, and South Africa. As we saw above in the case of Argentina, the higher levels of percapita income in the self-governing colonies led to the result that the ratios of FI and FDI to GDP were smaller than those in Mexico and Latin America in general.<sup>5</sup>

The group of non-Latin American independent third world countries would include China, Thailand, Egypt and Turkey. On historical grounds it can be argued that China during the

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<sup>5</sup>Regression results included in Twomey (1998) and expanded on in Twomey (2000) suggest that for 1913 there was a positive link between colonial status and FDI/GDP, but that this was associated with the cases of these countries of European settlement, because for the rest of the colonial world, that link was negative.

first half of the twentieth century was a proto-colony; certainly a major part of the expansion of foreign investment in China after WWI was the result of Japanese colonialist policies in Manchuria and the treaty ports. Foreign investment in Turkey declined after the breakup of the Ottoman Empire, as did that in Egypt with the advent of Gamel Abdul Nasser. Hindering the search for broad trends is that the rest of the third world offer few if any non-colonial cases for the first half of the century. The post-independence experience is difficult to characterize, except in its diversity; some countries welcomed foreign funds, others shunned them, and many changed policies with some frequency. The overall averages appear to parallel those of Latin America, again suggesting that the Mexican experience is not unusual.

One of the reasons for analyzing FDI/GDP is to use it as a proxy for foreign ownership, and therefore control, of a the host country=s economy. For Mexico and several other third world countries included in the previous table, direct estimates are available of national capital stock, or total national wealth, and the corresponding ownership ratios are presented in Table 8. The data used for Mexico are discussed at the end of the Appendix, while that for the other countries are discussed in Twomey (2000). The results from Table 2 of a decline of foreign ownership of Mexico=s fixed assets from the pre World War I era would seem to be the general case, although not in colonies such as Korea and Taiwan, for the reasons discussed above. Interestingly, the Canadian data indicate fluctuations around a low level, rather than a secular decline over the century. Furthermore, the ratio FDI/K in Mexico in 1910 and 1930 would appear to be above the average for Latin American countries. Unfortunately, current methods of estimating capital stock (summing investment from the national accounts data, suitably deflated and discounted) are not comparable to these earlier estimates, so complete century long comparisons of the corresponding ratios are not possible.

#### **IV. Explanations of the Trend of Foreign Investment in Mexico**

Several factors potentially contribute to the explanation of long term trends in foreign investment. A thorough analysis would include external and internal factors, political and economic variables, portfolio and direct investment, and aggregate and sectoral disaggregations. Our two areas of focus will be a consideration of the importance of domestic policies controlling foreign investment versus changes in the international capital market, and secondly, the evolution of domestic economic changes that can be shorthand described as the workings of the product cycle.<sup>6</sup>

For at least half the twentieth century, Mexico was at the forefront of Latin American countries with her policies restricting foreign investment. One popular reading has it that the animus of the Revolution was directed at foreign exploiters and their local accomplices. The result of the armed struggle was a nationalist government led by a political party which institutionalized that revolutionary zeal. The nationalization of the petroleum industry in 1938 was the high point of that process, followed by restrictions on foreign direct investment, up

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<sup>6</sup>One is reminded of Taylor=s listing of phases in Argentina: A[A] legacy of unwilling foreign creditors in the 1910s and 1920s, capital controls in the 1930s and 1940s, capital price distortions in the 1950s and 1960s, and wayward monetary policies in the 1970s and 1980s.@ Taylor (1998, 149).

through the nationalization of the electricity sector in 1960 and sulfur mining in 1967. A corollary of this political interpretation is that the more recent neo-liberal presidential regimes have reversed that policy orientation, leading to a rapid expansion of FDI recently, particularly under NAFTA.

This is a convenient story, one with which people at several points along the political spectrum can feel comfortable. However, we wish to suggest several significant qualifications to this interpretation.

### **Díaz and the Revolution**

Before the Revolution, President Porfirio Díaz and his Finance Minister José Limantour had purchased control of the railroads, which had been predominantly foreign owned and operated.<sup>7</sup> This was done with borrowed money, and indeed with the government obtaining control primarily by absorbing the railroads' debts, rather than purchasing equity.<sup>8</sup> What was called Mexicanization of the railroads was carried out during the first decade of the twentieth century but close to the outbreak of the Revolution to allow those actions to demonstrate their purported benefits. In sum, it is inaccurate to attribute the decline of what had been the largest sector of foreign investment to the forces unleashed by the Revolution.<sup>9</sup> One can of course interpret the Mexicanization decision of Díaz and Limantour as responding to nationalist motives, but such a reading undermines the even more fundamental depiction of them in the above convenient story as anti-nationalist, free market, *científico* purists.<sup>10</sup>

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<sup>7</sup> Note that gaining control was not the same as obtaining complete ownership, which would have been much more expensive. In addition, the government did not control all the railroad companies.

<sup>8</sup> The amount of railroad debt that the government absorbed, US\$164 million (Zabludovsky 1998, 185) was larger than the value of the government's stock in Ferrocarriles Nacionales with US\$115 million (D'Oliver 1965, 1076).

<sup>9</sup> At the same time, railroads got enmeshed in the revolutionary process, and became a major area of conflict between Mexico and foreign interests. The 1910 loan was suspended after Díaz's departure, so payments on the purchased railway lines were not made. All sides of the conflict used the railway system, and tried to keep others from doing so, resulting in much destruction. There was long-building resentment against the attitudes of the foreign technicians towards their Mexican underlings. The railroad workers union was one of the strongest in the country. The financial mess regarding foreign owned stocks and bonds was not worked out until the 1940s, and the Mexican government finished paying off those debts in 1960.

<sup>10</sup> See Grunstein (1999) for an interesting review of different approaches to the explanation of Limantour's railroad policy, which include straightforward anti-trust considerations, fear of having the design and operation of the Mexican system being subjected to the needs of the northern neighbor, or a broader political, nationalist rejection of foreign control, and the more specifically anti-americanism that supposedly characterized this person of French descent with many English friends.

Secondly, although the nationalization of the petroleum industry was a landmark event in twentieth century Mexico, we might temper the impression of nationalist fervor by noting that foreign investment in mining always amounted to more than that in petroleum, and that the former sector was never the target of such policies. To speak in quantitative terms, the petroleum industry only accounted for about one sixth of total FDI stocks during the 1930s, so that the nationalization of this sector directly contributed to only a small part of the decline of FDI, much less than did the disappearance of the foreign presence in the railroads. Most tellingly, the ratios FDI/GDP and FDI/K continued to decline during the 1940s and 1950s, after the major nationalizations. While it is true that during those years nationalist policies continued to be heatedly debated by people on both sides of the ideological divide, it is also the case that FDI inflows were always positive during the period.

A useful periodization would take the pre-revolutionary years as a time of market-compatible Mexicanization directed at one major sector; the years during and immediately after the Revolution involved forced expropriation and destruction associated with military actions; the uneasy years of the 1920s and 1930s, culminating in the nationalization of oil; followed by a three decade long period during which FDI was permitted within certain limits. Approved sectors were specified, and majority ownership by Mexicans was the rule. However, these controls became less restrictive as time went on. During this last phase the absolute amount of FDI grew, although it continued to decline in relative terms, as the result of the growth of the country. Such an interpretation recalls the term used to describe much of this period, *desarrollo estabilizador*.

The extension of that point would be that by the time the electrical sector and the sulfur mining industry were purchased, the government had clearly embraced a policy quite receptive to foreign investment. FDI in manufacturing had been increasing for two decades. The nationalist rhetoric was recognized as being increasingly hollow. In 1962 a decree allowed foreign investment in the automotive sector with no Mexican co-participation in ownership. In 1965 the government began the *maquila* program. These export processing zones represent the very antithesis of nationalist approach to foreign investment. Two years later the sulfur mines were nationalized.

A good review in English of the evolution of the Mexican government's policies towards FDI is available in Whiting (1992), and a particularly insightful reading of the policy toward the investment by the multinational automobile companies is Bennett and Sharp (1985).<sup>11</sup> These authors work towards developing a rationalist model of policy-making towards foreign investment, responding to perceived costs and benefits, which vary over time depending not so much on political ideology, but on local entrepreneurial abilities, bargaining abilities of the companies and the host country's government, and lobbying efforts by various interest groups. In this view, decision makers in the firms will mediate between pressures arising in their home countries and the advantages in the host country, while comparing several different host country possibilities. Government officials in the host country will attempt to get the best offer from the

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<sup>11</sup> Indeed, the English language literature on foreign investment in Mexico is much deeper than that relating to foreign investment in any other third world country. One thinks of works by Vernon, Hansen, and Blomström, not to mention several attendees at this conference. A useful summary of recent events is Dussel Peters (2000).

small number of potential investors, as judged in terms of employment, tax revenue, foreign trade considerations, and technology transfer. Both sides hedge their bets by entering into what Vernon was the first to label >obsolescing bargains;= agreements which will need to be renegotiated after a period of time, when both sides will better be able to calculate costs and benefits (Bergsten et al. 1978). Over time the balance of these calculations will evolve, leading to a change in policy regarding FDI. For example, Whiting (1992) correctly perceived the trend towards the dominance of issues relating to technology transfer.

### **Viewing FDI from a Product Cycle Perspective**

A broad conceptual model to describe the suggested process of a rise and decline in FDI as driven by economic fundamentals is the product cycle.<sup>12</sup> The railroad sector is a clear example. Domestic producers (including the government) learn the skills necessary for running the trains. The activity becomes relatively more attractive to domestic agents when the initial rents from developing new lines and markets are exhausted, leading to a decline in foreign investment.<sup>13</sup> Evidently in the case of railroads other major contributors to the decline in foreign investment were the diminished demand for the services of this sector with the expansion of automobiles and trucks, and the general destruction that occurred during the armed phases of the Revolution.

A similar interpretation favoring the explanation of trends in FDI by longer term economic factors instead of revolutionary nationalism can be posited for Mexico=s mining sector. Foreign interest in this sector had declined before fighting broke out. Pre-Revolutionary mining activities had concentrated on gold and silver, but their veins had been mined out, many were flooded due to wartime damage and lack of attention, and the post WWI competition from locations overseas doomed them. The purchase of the electrical company certainly came at the end of the foreign-ownership phase of its product cycle, when there were minimal economic benefits accompanying the need to maintain a nationalist facade.

These examples from the product cycle paradigm have focused on changes occurring inside a given sector. However, they can be extended by adopting an inter-sectoral cyclical perspective. Specifically, one notices the changes in the relative importance of different sectorsBagriculture, manufacturing, services, as the economy develops and income per capita grows. It is the nature of manufacturing processes that they will be more attractive to FDI than will services, as illustrated above by the data in Graph 3. However, with the growthBmight one even say developmentBof a country like Mexico, there is an expectation that services will grow relative to manufacturing, with primary activities like farming and mining long left behind. But with a lower FDI ratio in services relative to that in manufacturing, the result might be that the economy-wide

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<sup>12</sup> A detailed analysis of the phases of FDI in a product cycle framework is presented by Narula (1996). Unfortunately, his quantitative analysis is restricted to industrial countries.

<sup>13</sup> A more thorough examination of railroad cycles would need to explain why in some countries the initial expansion was financed by domestic interests, who were subsequently replaced by government. Riguzzi (1995) noticed that Mexico did not follow the cyclical model outlined by Colin Lewis (1983)

ratio of FDI to GDP (or K) will fall.<sup>14</sup>

An important contribution to the discussion of the macro-history of foreign investment is the interpretation of Alan Taylor and his co-authors of foreign investment flows in an extended version of a life-cycle model (see Taylor, 1998). In Argentina before WWI the average age of the population was much younger than in Britain, and the country was growing. This young population had insufficient savings, and hence needed to borrow from abroad. The major contrasts between the Argentine and the Mexican case would be the importance of immigration in the Argentina, and the more rapid growth there, leading us to doubt the applicability of that cyclical explanation to the Mexican case, although the hypothesis should be subjected to formal testing.

Although discussions of capital flows into Latin America have emphasized the restrictive effects of nationalistic policies, the experience of Mexico should also remind us of the negative impact of contractions in the international markets. Both world wars and the 1930s depression are the obvious examples. But the aftermaths of these events were also important; Britain and the other European countries refrained from investing outside of their colonies in the third world during the 1920s, even before the depression. After 1945 there was a major bottleneck in capital availability; the international economics literature of the 1950s speaks incessantly of capital scarcity. This is a major message in the World Bank sponsored report of Mexico, Combined Mexican Working Party (1953), as well as various U.N. and ECLA studies.

In the international finance literature there has been some attraction to the idea that the international credit markets were very open before World War I, and subsequently went through a long period of controls, only to be re-opened significantly during the last couple of decades of the century. See Taylor (1998) for references. This vision is a re-formulation of the simple story outlined above, in which nationalist policies cause a restriction of foreign investment during the middle of the century. The analysis of this paper now allows us to question the interpretation of the initial condition of high levels of FI having resulted specifically from openness. The core concept of openness has not been defined in a manner allowing for measurement, of course, because of data availability. But it would seem that what analysts have in mind is a low cost of moving funds internationally, and an absence of government regulations in the host country.

At the start of the twentieth century, Mexico certainly had high amounts of foreign

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<sup>14</sup> An example for the arithmetically challenged. Suppose two sectors, manufacturing and services. Initially in manufacturing there are 4 foreign-owned units of capital, and 6 that are locally owned. In services, suppose initially there is 1 foreign unit, and 9 domestically owned units of capital. The overall ratio of FDI/K is 0.25, while it is 0.4 in manufacturing, and 0.1 in services. Now suppose that in the second period there are 5 foreign owned units of capital out of a total of 12 in manufacturing, giving a sectoral FDI/K of 0.42. Furthermore, suppose a more rapid overall growth in services, with 2 foreign owned units, and 17 locally owned, giving an sectoral FDI/K ratio of 0.105. FDI/K has risen in both sectors. However, for the aggregate economy, there are now 7 foreign owned units of capital, and a total of 31 units, so that the economy-wide ratio of FDI/K has fallen to 0.22. If the differences between the sectors in terms of growth rates is high enough, the average FDI/K will fall even if in each sector the ratio of FDI/K rises.

investment relative to GDP and our crude measures of the capital stock. Presumably the discussion should avoid foreign lending to the government, whose magnitude would not be taken as an indicator of financial liberalization and laissez faire, and no one would praise the earlier nineteenth century bouts of foreign lending to the governments of many Latin American countries, including Mexico. So, with regard to FI in the private sector in Mexico in 1911, the amount of FDI outside of railroads was rather smaller, as we have seen. Moreover, what in the second half of the century was the dominant mode of FDI--expansion by a firm which developed technology and productive capacity in its home country, to other sites via subsidiaries and branch plants had been nearly unknown before WWI in Mexico or anywhere else, and certainly not subject of government restrictions. Before the Revolution, most foreign capital came to Mexico as foreign loans. We noted earlier that the people operating the railroads, public utilities, and other free standing companies that received these loans, were foreigners. In other words, there was minimal lending of foreign capital to the Mexican entrepreneur. For this group, there was not significant capital mobility.

The decline in free standing companies is discussed at length by the various authors in Wilkins and Schröter (1998). Although not universal, this decline was widespread and predominantly explained as due to what we are calling product cycle factors, not government regulations or worsening capital markets.<sup>15</sup> Domestic entrepreneurial abilities increased, and the domestic capital market increased in size and accessibility. Foreign lenders backed out as improved information revealed the weaknesses of so many firms run by promoters, particularly in mining. Research on domestic entrepreneurship and financial development is in its early stage, and being led by people such as Haber and Marichal. Implicitly, our explanation for the weak domestic capital market does not venture outside the standard textbook factors describing the deficient operation of the domestic capital market--banks, the stock market, ineffective government regulations, and so on. Domestic restrictions on capital flows, while present, were not dominant. As banking, the stock market, and the legal framework improved, there was less need for borrowing from abroad.

So our counter argument to the capital mobility thesis has two parts. First of all, Mexican entrepreneurs did not participate in the capital mobility. Secondly, a major contributor to the reduction of FDI was the net result of several processes summarized as the product cycle.

### **Post-1980 Resurgence in Foreign Investment**

Events surrounding the revelation of the severity of Mexico's debt problems in August, 1982 marked a point of definition of the country's policies toward foreign economic relations. In a desperate move to gain control of the balance of payments, the banking system was taken over by the government. That was the last gasp of such nationalist oriented policies, and subsequent government policy became ever more compatible with the reigning philosophy at the World Bank and the IMF. A bold initiative in that direction was the proposal to expand the 1989 free trade agreement between Canada and the United States to include Mexico. Although the NAFTA

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<sup>15</sup> For a parallel analysis of the decline of the British Agency Houses in India, as resulting from a lack of competitive abilities on the part of foreigners, and a newly found entrepreneurship on the part of local businessmen, see Misra (2000).

agreement is usually analyzed as an arrangement on tariffs, it has proved to be a great stimulus to FDI into the country. Recent FDI inflows have averaged three percent of GDP, compared to an average post-WWII level of closer to one percent, which dipped to one half percent around 1970. This resurgence has not lasted long enough to bring the country's levels of the stock of FDI compared to GDP or K back to what was seen at the start of the century. The major difference is that the current splurge of FDI is oriented towards exports. Although mining and petroleum were also export oriented, neither pre-WWI railroads nor the mid-century ISI manufacturing FDI had that motivation. It remains to be seen how long the current phase will continue.

### **Outward Investment from Mexico**

The logical continuation of the product cycle model of FDI is that a country such as Mexico will eventually become a net exporter of FDI. Such a prediction will encounter much scepticism, especially in an audience of Mexicans. Indeed, the parallel statement finds many doubters among informed Canadians, and yet that country is now a net exporter of FDI. Table 9 reviews the situation for several countries. Not only has Canada emerged as a net outward investor, but so have Taiwan and Korea. The higher levels of inward FDI/GDP in Canada reflect that country's two-fold attraction as a source of raw material exports, and for its large internal market which is very accessible to its southern neighbor. In contrast, Taiwan and Korea have experienced lower levels of FDI/GDP, possessing neither of those two attractions, while operating with strong government controls on inward FDI. Consideration of these factors leads to a conjecture that Mexico's long run level of FDI/GDP will be less like that of Taiwan and Korea, and perhaps more like that of Canada. Correspondingly, the period required for Mexico to develop the abilities to compete successfully in world markets may well be much more than was needed by these two Asian tigers.

### **By Way of a Summary**

The basic result of this research is the large decline of foreign ownership in Mexico during the twentieth century. This finding is robust to our efforts at controlling for a bias due to price changes, and is true even when loans and railroad investments are omitted. To be sure there is a large U-shaped pattern of total foreign investment relative to GDP, but that results primarily from the inclusion of foreign loans in the numerator, and to a lesser extent from the use of GDP instead of the capital stock in the denominator. Current levels are much less than those of a century ago, especially when the comparison is made with respect to the country's total capital stock. It is hoped that the reader will find useful the efforts at scraping together the data that permit these calculations.

Our efforts at sketching out an explanation had three components that distinguish these findings from the popular version of Mexican revolutionary nationalism. The railroad sector was shown to have been a major area of foreign investment, whose decline had started during the Díaz regime. Secondly, it was argued that a process similar to the product cycle has been active, wherein the inherent abilities of domestic entrepreneurs eventually displace foreigners. This story becomes clearer if analysis is focused on individual sectors, of which the railroad story is perhaps the easiest to understand. The published literature suggests an explanation of the early twentieth century decline of foreign investment in other sectors, where the dominant entrepreneurial mode was free standing companies. Furthermore, it was argued that the product cycle view gains

credibility due to the similarity of the evolution of Mexico's macroeconomic aggregates to those of other Latin American countries, for whom the political conditions were different.

The third component of the explanation downplays the role of nationalistic policies after about 1950, in results if not in rhetoric. How revisionist this position is judged to be will depend on the perspective of the reader, and for many students of Mexico such an argument is old news. There may be value in clearing out the cobwebs from this historiographical corner, as the country more openly embraces a policy of open arms to foreign capital.

## APPENDIX

### Estimates and Data on Foreign Investment for Mexico.

This appendix will review the several sources of data on FDI and other components of FI for several sub-periods of the twentieth century. Official estimates of foreign direct investment in Mexico start for the end of 1938—not coincidentally right after the nationalization of the petroleum companies, and these will be relied on for the period up to 1970. Although for the prior years there is some national census information, the major sources of data for investigators are from the investing countries, the most important of which were the United Kingdom and the United States. Our treatment of that earlier period will include a detailed discussion of those secondary works, relating them to the classic Mexican study by Luís Nicolau D=Olwer (1965). During the 1980s, it became more important for the Mexican authorities to have accurate information on FDI, and the greater care taken in the development of statistics generated some discontinuities in the available series, as sources and methodology changed. Several issues will be mentioned in our comments on the elaboration of the series on foreign investment for the period after 1970.

There will also be a short discussion of estimates of the total capital stock, and that in railroads.

### Pre-World War I Foreign Investment

For our estimate of the value of foreign investments in Mexico in 1911, the decision was made to use the results of D=Olwer (1965), published as part of the series on the *Historia Moderna de México*, under the general editorship of Daniel Cosío Villegas. The perceived advantages of D=Olwer, as opposed to constructing separate estimates by country or sectors using more recent results, are the inherent consistency of using one author's numbers, and the fact that his detailed knowledge of individual sectors or country experiences led to estimates that remain credible even after four decades of subsequent research.<sup>16</sup> Using a variety of both primary and secondary sources, D=Olwer estimated (p. 1154) total foreign investment at the equivalent of US\$1,700 million, of which foreign debt was US\$250 million, investment in railroads at US\$565 million, and all other investment summed to \$885 million. The two major

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<sup>16</sup> D=Olwer's summary of foreign investments on the eve of the Revolution is superb in terms of the breadth of its coverage and the accessibility of its style. Nevertheless, along with Liehr and Torres Bautista (1998, 276), we would welcome a reconsideration of the topic, precisely because of the need to incorporate the research results published since then.

investing countries were Great Britain and the United States, and D=Olwer attributes one third more capital to the former country. We will discuss the British case first, contrasting D=Olwer=s estimates to others that are available. Then, after examining the data for 1911, we will present a synthetic estimate for 1900.

D=Olwer calculated foreign investment in Mexico from Great Britain in 1911 at slightly less than , 100 million, of which government debt was only , 8 million. With regard to British capital in Mexico (and other parts of Latin America), the study covering the longest timespan is Rippy (1959), which is based on several business magazines, especially the *South American Journal*. He reported (p. 68) a total level of British investment in Mexico in 1913 of , 159 million, of which , 103 million was railways, , 29 million was government bonds, and , 27 million was other economic enterprises. However, in his book=s later chapter on Mexico--entitled ABonanzas and Heartbreaks@-- he revised downward these totals by a third, principally because he believed they exaggerated the amount in railways, which he simply asserted had never been more than , 51 million (pp. 96-97).

Another important source of estimates comes from the work of Irving Stone and his collaborators. The published version of Stone=s dissertation (Stone, 1987) provides data on accumulated totals of British capital invested in Latin America for six benchmark years covering the period from 1865 to 1913. The total for Mexico in 1913 was , 130 million, of which , 45 million was government loans, , 31 million was railways, and the remaining , 54 million was in other sectors.<sup>17</sup> The increase in British capital in Mexico according to Stone (1987) for the period 1865-1913 is calculated to be , 104 million. Of the , 26 million reported for 1865, , 24 million was government loans (most of that in default), and only , 0.6 million in railroads.

A different source, providing data on annual flows from Britain to Mexico, is the series of Simon/Segal/Jenks, and was published in full as Stone (1999).<sup>18</sup> According to this source, the accumulated increase in British investments in Mexico for that same period was only , 80 million. The biggest discrepancy in the data on British investment in Mexico between Stone (1987) and Stone (1999) was in the areas outside of government debt and railroads, which in this paper is referred to as Aother@ investments. These increased by only , 35 million in the Simon/Segal/Jenks series, as opposed to the , 54 million mentioned in Stone (1989). The accumulated total for such Aother@ investment in Rippy (1959) was only , 27 million. For British loans to the Mexican government, the Simon/Segal/Jenks series accumulates to an increase of , 16 million between 1865 and 1913, while calculating the corresponding increase in Stone (1987) yields , 22 million. These two sources give essentially equivalent amounts of

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<sup>17</sup> There are some minor differences between the totals for the benchmark years in Stone (1977) and Stone (1987). The actual date of the dissertation was 1962.

<sup>18</sup> This collection was started by Leland H. Jenks and Matthew A. Simon; the latter was subsequently assisted by Harvey H. Segal. When the book was published in 1999, those three were deceased. The author/editor of this book, Irving Stone, also wrote the study mentioned in the previous paragraph, which used an independent set of numbers. However, it is the case that the 1999 book contains no discussion of the compatibility of the two data sets, even though some remarks are made with regard to the Davis-Huttenback series.

increases of investment in railways-- , 30m over 1865-1913, which is forty percent less than Rippy=s maximum of , 51 million, discussed above.

An important example illustrating the difficulties in estimating foreign investments is the data on railroads. The financial press on which Stone, Rippy, and Simon/Segal/Jenks relied tended to attribute all of any particular emission of stocks or debentures to one particular country. However, it is generally accepted that British investors owned considerable amounts of foreign securities in some railroad companies that were not controlled by British. Stone (1989, 57) explicitly recognizes this problem with his data, mentioning that his sources= methodology A...tended to overstate British investments in certain companies that were not >British=. An illustration would be the large Mexican railway systems organized and built by American promoters after the turn of the Twentieth Century.@ We can pursue this detail using the appendix in Stone (1989), which carefully listed all the companies and the investment instruments, along with their attributed investment totals for his reference years. He included no British-owned equity in the Mexican Central Railroad in 1905, and none in the Mexican National Railroad in 1895 and 1905, but sizeable amounts of bonds in both firms in both years, apparently all of any particular issue.<sup>19</sup> Nothing was indicated for either enterprise in 1913, although almost eight million pounds of debentures were held by the Mexican Central Railway Securities Co., founded in 1899, Ato hold securities of Mexican Central Railway Co. & to secure a position of influence over that co. by a preponderating holding of bonds@ (p. 468). Thus the , 20 million decline in British investment from 1895 to 1913 reported in Stone (1987, 153F) is unacceptable. It neglects US portfolio investment, only crudely approximates British equity investment, and incorrectly assumes that when the government took control of the National Railroad, all foreign investment left that company. The magnitude of the latter error can be appreciated by noting that D=Olwer (1965, 1077) estimated British investment in Ferrocarriles Nacionales in 1910 at US\$86 million, and the total foreign investment in it was US\$304 million.

Comparing D=Olwer=s numbers with the studies based on Great Britain, his total for Britain was lower than those of Stone and Simon/Segal/Jenks, and slightly less than the revised Rippy estimate, while being much less in government bonds. The data of the Simon/Segal/Jenks series in Stone (1999) presents annual flows, which appear to be gross instead of net, as none of the figures, railroad or otherwise, is negative. Reliance on this series to estimate a stock total is clearly unsatisfactory. As mentioned, the railroad data in Rippy (1959) are even more unacceptable, as he felt the need to reduce them by half, without providing an acceptable justification.

We are not qualified to use primary sources to generate better estimates. The problems have long been familiar in this literature. Miller (1995) reviews the criticisms by D.C.M. Platt and others. It would appear that a major source of the discrepancy is the treatment of government bonds, and failure to account for repayments (perhaps by refinancing), nor the thornier issue of the treatment of bonds in default. A separate contributing factor is how to classify loans to the government which are destined for an activity such as railroads, either as direct expenditures or

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<sup>19</sup> Barlow (1902, 488) made the parallel, similarly erroneous attribution of all foreign investment in the Central and the National railroads to United States interests. This point seems to have slipped by D=Olwer (1965, 1081).

subsidies. Should these be classified as loans to the private sector, or to the government?<sup>20</sup>

Overall there is agreement on the preponderance of railroads, and the smaller amount of money going to the government after 1870.

There is less controversy about the pre-1929 size of investments from the United States, which ultimately reflects the authority that scholars attribute to the work of Cleona Lewis (1938). Nevertheless, the literature does present dramatically different totals, some of which will be mentioned below. For the United States in 1911, D=Olwer=s total was the equivalent of US\$650 million, which is about 15% less than what would be derived from a straightforward interpolation of the totals in Lewis (1938) using her reference years of 1908 and 1914. D=Olwer attributed US\$30 million of U.S. investment to government debt, and US\$265 to railroads. These figures are basically compatible with those of Lewis. She reported US\$110 million as the stock of U.S. direct investment in Mexican railroads in 1897 and 1914, and that this had temporarily dropped to US\$57 million in 1908. We know from *Poor=s Manual*, Powell (1921), or Long (1925), as well as from the experience of most other countries, that the financing of Mexican railroads was roughly split between debentures and equity. Thus Lewis=s FDI figure is an incomplete estimation of total U.S. investment in railroads. Her total amount of portfolio investment in Mexico, Adeductions having been made for repatriations and repudiations,@ rose from zero in 1897 to US\$246 million in 1908, and to US\$ 266 million in 1914. These portfolio investment were further (pp. 652-4) subdivided into long and short term dollar loans, at a suspiciously constant US\$139 million in 1908 and 1914, foreign currency loans which rose from US\$12 million in 1908 to US\$23 million in 1914, and shares in foreign controlled corporations, also constant at US\$105 million for those two years. Notice that assigning all of these latter to railroads results in a total U.S. investment in railroads for Lewis in 1914 of US\$225 million, which is close to that of D=Olwer.<sup>21</sup>

D=Olwer=s estimate for France of US\$450 million is in line with that reported by Rippy, Mauro, and others. He is the only researcher to have presented estimates of foreign investment from Germany, Holland and other countries; their sum of about \$100 million is only about five percent of the total.

Our explanation of the differences between D=Olwer and the British sources used by Rippy, Stone, and Simon/Segal/Jenks was that these latter authors ignored repayments or

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<sup>20</sup> This difficulty is seen clearly in the study of U.K. overseas capital by Davis and Huttenback (1986), whose solution was to provide alternative estimates for the U.K. and the receiving countries, depending on interpretations of government related railroad capital. This issue is important in Mexico as well. Zabludovsky (1998, 187) provides a breakdown of the uses of the government=s foreign debt during the *porfiriato*, indicating that 31 percent was used for direct investment in railroads and another 16 percent in railway subsidies.

<sup>21</sup> It was probably the case that there was significant U.S. portfolio equity in other sectors, such as public utilities. The Letcher/Seamon report (Letcher,1912) attributed to U.S. investments in Mexican railway equity stocks in 1912 the amount of US\$ 235 million, and to that in bonds US\$408 million. The Letcher/Seamon total valuation of total Mexican railway stocks and bonds, over US\$ 1 billion, compares to our US\$800 million estimate described below.

rescheduling, and the inherent difficulty in classifying loans given to the government that were to be used for railroad expenditures. These considerations are important when making an estimate of foreign investment in Mexico for 1900. We will now present our estimates for that year by building it up from its three components; government, railroads, and other sectors.

The major consolidation of the Mexican debt occurred in 1899, which makes 1900 a convenient point of departure for the empirical analysis of this paper. Refinancings at lower interest payments did occur in 1903, 1904, and in 1910—that of 1910 being interrupted by the outbreak of the Revolution. The dollar value of the government's official, or direct, foreign debt was US\$120 million in 1900 and US\$150 million in 1911 (Zabludovsky 1998, 185). If we ignore those authors whose data simply represent accumulated gross borrowings without considering repayments, there is no disagreement on this; DeOlwer, Zabludovsky, Turlington, Bazant, and the Corporation of Foreign Bondholders all use the same official figures for the direct debt in foreign currency. However, differences do arise as to treatment of other debt that might be considered foreign, and the handling of the part of the 1910 refinancing that was not completed before the old order collapsed. With regard to the other debt in 1911, Zabludovsky adds US\$83 million in other foreign currency debts explicitly guaranteed by the government, and US\$164 million in railroad company debts that were transferred to the government upon the Mexicanization of the railroads, which he refers to as indirect debt.<sup>22</sup> In contrast, DeOlwer's total of foreign held debt in 1911 was M\$498 million, just under US\$250 million (p. 1154). DeOlwer (1965, 1051) follows Turlington (1930) in attributing the some 135 million pesos to foreign holders of the internal (peso) debt, which would have been US\$67 million. DeOlwer's datum on government guarantees was the equivalent of US\$22 million, which is quite a bit smaller than the total calculated by Zabludovsky. These details imply that those who would prefer a broader concept of debt such as is available in Zabludovsky, should use a figure for debt that would be twice as high as that used by DeOlwer. To make a comparably broad estimate of total debt in 1900 would require evaluation of the railroads' subsidies and debts for that year, and government commitments to those companies, which will not be attempted here. For the purposes of Tables 1 and 2, we calculated foreign investment in government debt for 1900 by subtracting from DeOlwer's figure the increases over 1900-1911 in direct debt, while assuming that the corresponding amount of indirect debt was zero.

Let us now turn to the estimate of foreign investment in railroads in 1900. From the previous discussion, we know that to use published sources from the investing countries for an estimate of investment in railroads would involve choosing among conflicting sources for an estimate of U.K. railroad investment, and using Lewis's obviously limited estimate for U.S.

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<sup>22</sup> Note that this use of the term *deuda indirecta* by Zabludovsky differs from that of DeOlwer, who used that term to refer to any government guaranteed debt. Moreover, the sum of DeOlwer's indirect debt in his Cuadro XIV was US\$ 22 million, rather less than Zabludovsky's guaranteed debt, not to mention his indirect debt. This detail should not distract us from the fact mentioned in the text, that all authors (Zabludovsky, DeOlwer, Bazant, Turlington, Corporation of Foreign Bondholders) accept the Mexican government source (SHCP) on the amounts of what we could call federal government direct debt, and its breakdown into foreign currency and peso debt.

direct investment in the sector. Behind the problems indicated for these sources is the fact that during the early years of the century the U.S. financiers were in the process of displacing U.K. financiers, in a game whose rules counseled against leaving information. The decision was therefore made to reject investment data from the source countries, and estimate total foreign investment in this sector by estimating the total value of the foreign owned firms in 1900 and 1910. Using *Poor=s Manual of Railroads*, we obtained US\$373 million for 1900, and US\$590 million for 1910.<sup>23</sup> The value of foreign investment in Ferrocarriles Nacionales was calculated by D=Olwer by subtracting from the total value of the firm=s capital the amount of government funds invested in 1910, implicitly assuming no private Mexican funds in that firm. We followed him in ignoring private Mexican funds in Ferrocarriles Nacionales as well as in the other big enterprises, except Tehuantepec and United of Yucatan, which were assumed to be entirely locally financed. Our figure for 1910 closely corresponds to the US\$ 565 in D=Olwer (1965, 1154), who presumably was familiar with the balance sheets of the companies.<sup>24</sup> It can be argued that the value of foreign investment in railroads should not include the value of government subsidies. These were an important component of total expenditures--roughly one sixth, according to D=Olwer (1965, 1083). We have not made this adjustment in order to stay with his figure; it is also the case that most of these subsidies were paid before the turn of the century, and so neglecting them does not significantly bias our estimated increase.

Our estimate for foreign investment in sectors other than the government and railroads is generated in a simple manner, by estimating the increases over 1900-1911 from Britain, the U.S. and France, and subtracting their sum from the subtotal for 1911 in D=Olwer. For Great Britain, we used the increase calculated by summing the annual flows in Stone (1999). For the U.S., we interpolated totals for 1900 and 1911 from the estimates for 1897, 1908 and 1914 in Lewis (1938). The increase for France was calculated from Rippey (1948). Investors from the United States accounted for half of the overall increase.

### **Foreign Investments in 1930**

The range of values of estimates of foreign investments is wider in 1930, due to the disputed status of the railroads and agricultural properties, as well as government default. For the period of the 1930s, semi-official statements of British overseas investment were presented in a series of articles in the *Economic Journal*, authored by Robert Kindersley, and eventually taken up by the Bank of England. For the period of interest to us, these estimates do not appear to have made adjustments for defaulted loans. The same problem occurs with the data from Lewis (1938) or Lewis (1948) on the U.S. Our solution is to use the estimated foreign investment in Alanís

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<sup>23</sup> As noted below, in one case, the value of the investment in one line had to be approximated using a figure of average cost per kilometer.

<sup>24</sup> To establish compatibility in terms of order of magnitude, our increase of total foreign investment in railroads of US\$220 million might be compared to the total increase in U.S. portfolio investment of US\$387 million between 1897 and 1914. Our rejection of Stone (1977 and 1987) leaves us without any clear idea of what happened to British investments during that first decade, so more precise comparisons are not possible.

Patiño (1943), which while not as thorough as D=Olwer=s work on 1911, does have the attraction of having been part of a larger study of Mexican wealth. He placed foreign investment in government debt at M\$ 1,013 million<sup>25</sup> and that for railroads at M\$ 1,144 million (Alanís Patiño 1943, 101) and for non-railroad FDI at M\$1,881 million (Alanís Patiño 1943, 130). His non-railroad investment attributed to the U.S. an amount equivalent to US\$378 million, compared to the US\$600 from U.S. sources, and his ,33 million from the U.K. was barely half the ,60 million from Rippy (1959, 78). We have seen that British capital in government and railroads was acknowledged to be exaggerated in the data of Rippy. A sense of this gap is provided by Cleona Lewis (1948) in her discussion of British investment in Mexico in 1938, which she totals at US\$880 million, of which US\$800 million is in arrears or non-paying.

### **Foreign Investment, 1938-1970**

As noted earlier, the Banco de México maintained a series on FDI starting in 1938. Its figures for U.S. direct investment are in good accord with the official data for the U.S. after 1950 generated by the U.S. Department of Commerce. It is the case that—as reported in Sepúlveda and Chumacero (1973) the Banco’s data for the first decade or so show important year to year differences from the data in the *Estadísticas Históricas de México*, although a calculation shows that the values for the long term accumulated stocks are similar.

Most of the story of the debates about the government=s debt between 1910 and 1950 has been told elsewhere (Bazant), and does merit coverage here. The pre-Revolutionary direct debt was ,30 million, which was about US\$150 million. Without going into details, this had risen to US\$ 230 million by 1942, and more importantly, back interest totaled US\$278 million (Bazant 1968, 221). The debt resolution agreement of 1942 reduced all that to just under US\$50 million. Motivation for the creditors= agreement to such a dramatic reduction include their interest in keeping Mexico on their side during WWII and their hope of securing a more friendly government in Los Pinos. A similar reduction of railroad debt occurred in 1946, reducing an accumulated debt of US\$ 557 million to one of US\$ 51 million (Bazant 1968, 225). Given the magnitude of debt that was eventually forgiven, we will not follow the changes in ratios such as debt/GDP before 1950. The government of Mexico re-entered the bond market in 1960.

### **Foreign Investment after 1970.**

In principle, there is no difficulty in obtaining data on Mexico=s overseas debt for the period after 1970, because of the existence of the World Bank=s publications *World Debt Tables* and its successor, *Global Development Finance*. Two comments can be made. For some reason the most recent issues of *Global Development Finance* have published a complete estimate of all debt (EDT) in 1970; previously, this series started after 1975 or so. Secondly, the reader is reminded that these publications occur with a time lag of a year or so, which means that outsiders did not have up-to-the-minute data on Mexico=s debt, especially the short term debt, during the crucial episodes of the debt crises of the 1980s and 1990s. With regard to the data on FDI into Mexico after 1970, our situation is complicated by the existence of two official sources, Banco

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<sup>25</sup> Very similar to the 1,089 million pesos of 1929 government debt from Turlington (1930, 318).

de México, and SECOFI/CNIE, with responsibility passing from the former to the latter during the late 1970s. The methodologies for estimating FDI evolved over time. Because one assumes that the World Bank and UNCTAD are able to follow the updating of those estimates by the official Mexican sources, we use recent issues of the key publications, *Global Development Finance* and *World Investment Report*, as the sources of our data.

The accumulated total of FDI for 1970 in the initial Banco de México series of US\$2,282 million is very close to the OECD total for 1971, reported in *Development Co-operation* (1973) as US\$2,450 million. For 1980, the SECOFI (1993) reports US\$8,459 million, while the UNCTAD *World Investment Report* says US\$8,105 million, which is still well within acceptable bounds. However, the gap subsequently expands. In 1990 the UNCTAD total FDI stock was US\$22,424 million, while that of SECOFI was US\$30,310 million, which is a difference of one third. For 1998, UNCTAD reports a stock of US\$60.8 billion, and although the recent Mexican government sources I have seen no longer report stocks, adding to the 1980 stock figure of US\$8 million the accumulated inflows from 1980 to 1998, that are reported on the Banco de México's website, of \$94 billion produces an estimated total FDI stock of US\$100 billion, or a difference that is now two thirds.<sup>26</sup> The tables in the text will use the *World Investment Report* figures, but it should be noted that use of these higher totals would not reverse the basic finding that the stock of FDI today is relatively smaller than it was before the Revolution.

The differences among these sources arise from the estimation of the annual inflows, as each source appears to sum them for the stock figures. As noted, the responsibility for estimating FDI was given to the SECOFI/CNIE from the Banco de México in the late 1970s. There was another important change in the methodology in 1994.<sup>27</sup> Comparability of results of

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<sup>26</sup> In Twomey (1993, 52) the argument was made, on the basis of comparison with U.S. Department of Commerce data, that the switch in 1977 from Banco de México to SECOFI/CNIE has led to a gradual exaggeration of the amount of FDI in Mexico. This bias has continued to grow in the 1990s. A weakness in this argument is that it ignores the final destination of FDI from the U.S. which is registered as going to tax havens in the Caribbean, and may well have ended up in Mexico. Nevertheless, it is the case that a comparison using the OECD's *International Direct Investments Statistics Yearbook*, of Mexican data on FDI inflows with that of several European countries also suggests that the Mexican data is too high.

<sup>27</sup> To cite an article from *Comercio Exterior*: >En el *Informe estadístico sobre el comportamiento de la inversión extranjera directa en México en 1997* se señala que los datos a partir de 1994 no son comparables y no es válido sumarlos con las estadísticas publicadas por la Secofi respecto de años anteriores, debido a las divergencias de las metodologías utilizadas. Antes de 1994 la IED se integraba con los montos notificados al RNIE en cada año (sin tomar en cuenta las fechas en las que se efectuaban las inversiones), más los correspondientes a los proyectos autorizados por la CNIE (sin considerar que la aprobación de un proyecto no garantiza su realización). La adición de los montos reportados al RNIE a los aprobados por la CNIE implicaba la combinación de inversiones reales con proyectos potenciales. = Citation from Salomón (1998, 806). Although Salomón does not indicate the author of the referenced *Informe estadístico*, one would infer that it was written by someone from the Secofi.

the two sources is made difficult by the financial crisis of that year, and the broader context of the entering into force of the NAFTA agreement that also encouraged FDI. That there has been a major jump in FDI inflows is unquestionable. After 1994, each year=s reported annual inflow of about US\$10 billion or more was equivalent to either one half or one third of the accumulated stock in 1990.<sup>28</sup>

Looking at the annual data from the Banco de México=s web page, one is struck by the fact that the annual amounts of portfolio investment was much higher before this latest methodological revision. The obvious suggestion is that the FDI for the earlier years was correspondingly underestimated. Evidently, the task of measurement in 1993 and 1994 was made more difficult by the economic crisis that occurred.

### **Portfolio Investment**

For the second half of the twentieth century, the distinction was commonly drawn between direct and portfolio investment, where the former implies control of a corporation, and is often specified empirically when ten percent of the stock is held by a single individual or business entity. Correspondingly, the traditional examples of portfolio investment are loans to governments. The presentation of United States overseas investment data for the period before 1935 in Lewis (1938) followed this distinction, and it has been maintained in U.S. government publications up to the present. In contrast, this was not the practice among those analyzing the British investment data, as we were recently reminded by Mira Wilkins, in her introductory essay to Wilkins and Schröter (1998). In presentations of the U.K. data, the practice was to distinguish between funds destined to the government and to the private sector, and/or to separate equity and bonds. The issue of control was thereby downplayed, and certainly not linked to stockholding. In the literature on the British case this issue became involved with the question of an asserted decline in British entrepreneurial ability before World War I, as reliance on bonds was interpreted as revealing an unwillingness to take risks.

In this light, both theoretical and historical reasons lead us to turn to the question of the size and importance of non-controlling portfolio foreign investment to the private sector in Mexico. The British experience clearly indicates substantial amounts of loans to railroads, and Liehr and Torres Bautista (1998) identified Anglo-Mexican railway firms as the group of free-standing companies which had raised the largest amount of overseas capital. In contrast, with regard to funds from the United States, Stallings (1987, 127) repeated the standard interpretation of estimates for the U.S. that foreign loans to the private sector in Latin America had not occurred until after World War II. Her classificatory scheme has the loans to the Mexican National Railways as being directed to a public (i.e. government) corporation. Liehr and Torres Bautista discuss British free-standing companies in mining and utilities; the key examples of the latter group being the famous Canadian firms. Outside of railroads, these were the important areas of portfolio flows to the private sector in Mexico. Overall, this literature gives us little reason to believe that there was much lending--portfolio foreign investment-- to Mexican-controlled firms early in the twentieth century.

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<sup>28</sup> For purposes of comparison, newspapers reported that the agreed amount to be paid for Banacci by Citigroup in May of 2001 was US\$12 billion.

Let us turn to the years after the second World War. The World Bank's *World Debt Tables* and its successor publication, *Global Development Finance*, provide information on lending for the period beginning in 1970. The major categories of long term debt are public and publicly guaranteed and private nonguaranteed. Evidently separating the category private runs into obstacles when evaluating semi-public institutions in the productive sphere, which can be producers of goods such as petroleum or steel, or of services such as electricity or transport. We saw this above for the pre-Revolutionary status of government debt backing up a semi-public institution such as the Ferrocarriles Nacionales. More importantly, one key facet of the 1980s debt crisis was the provision of government guarantees for private (or semi-private) enterprise debt. Thus in principle, the World Bank's category private nonguaranteed debt for the post-1970 period should lead to a conservative estimate of commercial lending to the private sector. In the Mexican case over 1970-1999, this category had its high of 46% of total long term debt in 1970, declining thereafter to reach a low of 7% in 1990. Evidently sovereign debt was relied on when the macro economy was weak, and correspondingly, the expansion of private sector borrowing overseas can be taken as an indicator of increased confidence in the domestic economy.

One of the major financial innovations in the last decade or so has been the expansion of what is referred to as foreign portfolio equity investment. The concept refers to the purchase by foreigners of a non-controlling number of shares of a corporation, typically through instruments such as American Depository Receipts and Global Depository Receipts. This has been made possible by the growth of equity markets particularly in emerging market countries such as Mexico and by regulatory changes in the capital exporting countries. Data on this phenomenon are quite scarce, although the Mexican authorities are quite conscientious in making the information available, as part of an overall policy of openness on economic data. The *Global Development Finance* now publishes a series on Portfolio Equity Flows, and the sum of its annual inflows for Mexico is quite close to that available for portfolio investments (Mercado Accionario subcategory of the Inversiones de Cartera) in the Banco de México's web page. These series only begin in 1990, reflecting the newness of the phenomenon. Contemporary foreign portfolio equity investment differs from that before 1911 in that today the ultimate equity market is located and regulated in Mexico, while a century ago the major market for Mexican railroad and mining stock was in London.

### **The Capital Stock in Mexico**

Even with very good basic data, the capital stock is difficult to measure. It is fortunate that for period 1950-1994, we can utilize the estimates of the real capital stock published by Hofman (2000). That author, working in the ECLAC offices in Santiago Chile, applied a perpetual inventory methodology to estimate this variable for Mexico and five other Latin American countries.<sup>29</sup> For the period up through 1950, the estimates utilized in Table 2 are derived from

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<sup>29</sup> A respected alternative set of estimates is that of King and Levine (1993). Their growth rates are similar to those of Hofman, except that the King and Levine estimated capital stocks in 1950 appear to be too high. In an appendix Hofman compares his estimates to those of other researchers (including earlier ECLA studies), concluding It is clear that growth rates as well as levels of capital stock differ substantially according to the study used. (Hofman 2000, 286)

those in Twomey (1993, Table 5.5). For the period up through 1940, the major source utilized was Alanís Patiño (1943), who used post-1930 census data, together with several estimates of domestic and foreign informed observers for the pre-revolutionary period. Thus the pre-revolutionary period numbers can only be considered rough orders of magnitude, which may, however, be sufficient for the calculations in the text. The quality of the data improves after 1940-using Goldsmith- and after 1950, using a series of studies of the Banco de México.

This author's estimate for 1950 can be compared with that of Hofman and a semi-official contemporary Mexican group,<sup>30</sup> the Combined Mexican Working Party (1953). Converting Hofman's data (in 1980 prices) into nominal terms by the GDP deflator yields the same order of magnitude for fixed capital for 1950. Hofman's gross fixed tangible reproducible capital was 1162 billion pesos at 1980 prices, which I calculate to be 84 billion at current prices in 1950. The Combined Working Party estimated fixed tangible reproducible fixed assets at 80 billion pesos, and inventories at 13.5 billion. Although Hofman's and my (deflated) series maintain parallel growth from 1950 to 1960, his figure for 1970 is almost double mine, and his is used in this paper's tables.

The question arises as to how important is the bias of ignoring inflation and depreciation in summing the data on annual flows of FDI to generate a stock figure for that variable. An elaborate methodology has been used by the U.S. Department of Commerce over the last decade or so, which considers the market value of that country's overseas investments, as revealed by changes in prices in stock markets (see *Survey of Current Business*). Our more modest proposal is to express each year's FDI flow in terms of constant prices, sum them to an initial value, and allow for depreciation by taking off two percent of the accumulated value each year. The initial value was that estimated by the Banco de México for 1938. The hypothesized rate of depreciation is admittedly quite ad hoc, on both theoretical and empirical grounds. The price index that was used to deflate the dollar values of the FDI inflows was the US GDP deflator. This price was used, instead of one such as one for manufactured export goods, because much of the investment expenditure of a firm will be for land, buildings, and personnel whose costs vary more with the general price level. An alternative would be to use Mexican price index and the peso value of FDI flows, and this would produce distinct estimates when the real exchange rate is not constant. This has often been the case for Mexico, because of a Dutch Disease type phenomena related to petroleum exports, and during exchange rate crises. The resulting variable is labeled Real-FDI. Evidently the procedure used here is a simple, exploratory one, suggestive of the importance of the factors touched.

### **Mexican Railroads**

Before the Revolution, the railroad system accounted for a major share of total capital invested in Mexico. One way of inquiring into its value is to use the balance sheets of the individual companies. For 1911, this is facilitated because of the consolidation of several of the major companies into the Ferrocarriles Nacionales (FF.CC.NN.). That company's *Annual Report* for 1911 indicated capital stock of M\$448 million, funded debt of M\$387 million, for a total of

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<sup>30</sup> Membership in this group included Raúl Ortiz Mena and Victor Urquidi, as well as Albert Waterson and Jonas Haralz from the World Bank.

M\$834 million, or US\$417 million.<sup>31</sup> On the other side of the balance sheet, the stated value of its assets of Aroad equipment, land, concessions, etc. totaled M\$828 million, suggesting that either method of calculating the value of the railroad would give similar results. Poor=s Manual included most companies of any importance in Canada and Mexico, as suggested by comparing the accumulated mileage for 1910 from the listings in *Poor=s Manual* with that of Calderón (1965, 625ff.). The investment of two U.S. companies, the Southern Pacific of Mexico and the Kansas City, Mexico, & Oriente were not listed separately, as they were incorporated with their U.S. firms. The value of the former was taken from D=Olwer (1965, 1078); the latter was calculated using the rule in D=Olwer, of US\$30 thousand per kilometer. Finally, the amount invested in the government-owned Tehuantepec railroad by 1911 might be put at US\$50 million.<sup>32</sup> This listing suggests that Ferrocarriles Nacionales represented about 60 percent of total railroad investment of US\$700 million, or M\$1,400. Domestic funds in those railroads included those in the Tehuantepec and United of Yucatan railroads, as well as government funds in FF.CC.NN., which D=Olwer (1965, 1076) put at US\$123 million. Our sum total of the value of railroads in Mexico before the Revolution is \$800 million. Overall, railroads may have accounted for one eighth of all reproducible capital, and one sixth of non-residential capital.

Similarly, the value of capital in Mexican railroads in 1900 is estimated at US\$386 million,<sup>33</sup> summing the values of the lines listed in *Poor=s Manual* for 1901, and adding in an amount for the Tehuantepec RR. Of course these estimates could be refined. This author was surprised to find that both the mileage and the value of the railroads increased so much during the decade before the Revolution.

Like most other countries at the time, Mexico subsidized the construction of its railway lines. One informed guess put the size of these subsidies in Mexico at one sixth total outlays on the railroads (see D=Olwer 1965, 1082). The SCOP estimated to Pablo Macedo that government subsidies given to railroad companies through 1902 were close to M\$136 million; D=Olwer=s updating (p. 1083) placed the accumulated total amount of subsidies before the Revolution at M\$161 million, which would have been over US\$100 million at the ruling exchange rates. This figure may not have included all state subsidies. The informed guess of one sixth is consistent with our calculated total value of the country=s railroad system. It goes without saying that this

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<sup>31</sup> This is consistent with the totals in *Poor=s Manual of Railroads*, although the mode of aggregation differs.

<sup>32</sup> Author=s interpretation of the information in *Poor=s Manual* for 1911, p. 1546. This line, eventually presided over by W.D. Pearson, the future Lord Cowdray, exhibited an unusually large terms of misuse of funds. One must recall that the isthmus at Tehuantepec was at one time considered a viable alternative to the isthmus at Panama for a trans-oceanic canal.

<sup>33</sup> D=Olwer (1965, 1081) cited an estimate of a Comisión Monetario@ which for 1902 put the value of foreign investment in the country=s railroads at US\$351 million, using a simple rule of a cost of US\$30 thousand per kilometer. This Comisión Monetaria would appear to have been the source used by Raoul Bigot in 1907, which is cited (as M\$767 million) by Alanís Patiño (1943, 104).

was a focal point of contemporary debate.

## Bibliography

- Alanís Patiño, Emilio (1943). "La Riqueza de México." *El Trimestre Económico* 10, pp. 97-134.  
An essentially identical paper appeared as "La Riqueza Nacional," in *Investigación Económica* 1955, XV,1: 53-82.
- Barlow, Andrew E. (1902), A Mexico, @ in U.S. Department of State, *Commercial Relations Annual Reports*, Vol. 1, Washington: USGPO.
- Bennett, D.C. and Sharpe, K.E. (1985) *Transnational Corporations Versus the State: The Political Economy of the Mexican Auto Industry*, Princeton: Princeton University Press.
- Bergsten, C. F., et al. (1978) *American Multinationals and American Interests*, Washington, D.C.: The Brookings Institution.
- Blomström, Magnus. (1989). *Foreign Investment and Spillovers*. London: Routledge.
- Calderón, Francisco R. (196 ) A Los ferrocarriles, @ Chapter V in D. Cosío Villegas (ed.) *Historia Moderna de México: El Porfiriato. La Vida Económica*, Volume 1, México: Editorial Hermes.
- Coatsworth, John H. (1981) *Growth Against Development: The Economic Impact of Railroads in Porfirian Mexico*, De Kalb, Illinois: Northern Illinois University Press. Spanish version *El impacto económico de los ferrocarriles en el porfiriato. Crecimiento contra desarrollo* (1984) México: Ed. Era
- Combined Mexican Working Party, The (1953) *The Economic Development of Mexico*, Baltimore: The Johns Hopkins Press.
- Davis, Lance E. and Robert A. Huttenback (1986) *Mammon and the pursuit of Empire: The political economy of British imperialism, 1860-1912*, London: Cambridge University Press.
- D'Olwer, L.N. (1965) "Las inversiones extranjeras," Chapter X in D. Cosío Villegas (ed.) *Historia Moderna de México: El Porfiriato. La Vida Económica*, Volume 2, México: Editorial Hermes.
- Dussel Peters, Enrique (2000a) *La inversión extranjera en México*, Serie desarrollo productivo 80, Santiago de Chile: CEPAL
- (2000b) *Polarizing Mexico: the impact of liberalization strategy*, Boulder: Lynne Rienner Publishers.
- Grunstein, Arturo (1999) A De la competencia al monopolio: la formación de los Ferrocarriles Nacionales de México, @ in Sandra Kutz Ficker and Priscilla Connolly (eds.) *Ferrocarriles y obras públicas*, México: Instituto Mora.
- Hanson, Gordon (2001) A Should Countries Promote Foreign Direct Investment? @ G-24 Discussion Paper Series No. 9. <<http://webuser.bus.umich.edu/gohanson/G24.pdf>>
- Hofman, André (2000) *The Economic Development of Latin America in the Twentieth Century*, Northampton: Edward Elgar.
- Jones, Charles (1995) A Los antecedentes de la moderna corporación trasnacional: Los grupos de inversión británicos en América Latina, @ in Carlos Marichal (ed.) *Las inversiones extranjeras en América Latina, 1850-1930*, México D.F.: El Colegio de México.
- King, R.G. and Levine, R. (1994) "Capital Fundamentalism, Economic Development, and Economic Growth," *Carnegie-Rochester Conference Series on Public Policy* 40: 259-92.

- Letcher, Marion (1912) *A Wealth of Mexico*, @ U.S. Department of Commerce and Labor, Bureau of Manufactures, *Daily Consular and Trade Reports* #168, page 136.
- Lewis, Cleona (1938) *America's Stake in International Investments* Washington, D.C.: The Brookings Institution.
- (1948) *The United States and Foreign Investment Problems*, Washington, D.C.: The Brookings Institution.
- Lewis, Colin (1983) "The Financing of Railway Development in Latin America, 1850-1914," *Ibero-Amerikanische Archiv* 9 n.s., 3-4: 255-78.
- Liehr, Reinhard and Mariano E. Torres Bautista (1998), *British Free-Standing Companies in Mexico, 1884-1911*, @ in Mira Wilkins and Harm Schröter (eds.) *The Free-Standing Company in the World Economy 1830-1996*, Oxford: Oxford University Press.
- Long, W. Rodney (1925) *Railways of Mexico* U.S. Department of Commerce Trade Promotion Series No. 16, Washington D.C. GPO.
- Miller, Rory (1995) *The London Capital Market and Latin American Public Debt, 1860-1930*," in Reinhard Liehr (ed.) *La deuda pública en América Latina en perspectiva histórica/The public debt in Latin America in historical perspective*, Frankfurt am Main: Vervuert.
- Misra, A.-M. *Business Culture= and Entrepreneurship in British India, 1860-1950*, @ *Modern Asian Studies* 34:2, 333-48.
- Narula, R. (1996) *Multinational Investment and Economic Structure*, London: Routledge.
- Organisation for Economic Co-operation and Development [OECD] (1972) *Stock of Private Direct Investments by D.A.C. Countries in Developing Countries: End 1967*, Paris: OECD.
- (1973) *Development Co-operation*, Paris: OECD.
- *Annual International Direct Investments Statistics Yearbook*, Paris: OECD.
- Poor=s Manual of the Railroads of the United States* (annual) New York.
- Powell, Fred Wilbur (1921) *The Railroads of Mexico*, Boston: The Stratford Co.
- Riguzzi, Paulo (1995) *Inversión extranjera e interés nacional en los ferrocarriles mexicanos, 1880-1914*, @ in Carlos Marichal (ed.) *Las inversiones extranjeras en América Latina, 1850-1930*, México D.F.: El Colegio de México.
- Rippy, J.F. (1948) *French Investments in Latin America*, @ *Inter-American Economic Affairs* 52-71.
- (1959) *British Investments in Latin America, 1822-1949*, Hamden, CT.: Archon Books.
- SECOFI (1993), *La inversión extranjera en México*, @ *Comercio Exterior* Marzo, pp. 211-216.
- Sepúlveda, Bernardo, and Antonio Chumacero. (1973). *La inversión extranjera en México*. México: Fondo de Cultura Económica.
- Stallings, Barbara (1987) *Banker to the Third World: U.S. Portfolio Investment in Latin America, 1900-1986*, Berkeley: University of California Press.
- Stone, I. (1977) *British Direct and Portfolio Investment in Latin America Before 1914*, @ *Journal of Economic History* XXXVII No. 3, 690-722.
- Stone, I. (1987) *The Composition and Distribution of British Investment in Latin America, 1865 to 1913*, (Reprint of the author's Ph.D. thesis of 1962). New York: Garland Publishing.
- Stone, Irving (1999) *The Global Export of Capital from Great Britain, 1865-1914*, Houndmills: Macmillan Press Ltd.
- Taylor, A. M. *Argentina and the world capital market: saving, investment, and international capital mobility in the twentieth century*, @ *Journal of Development economics* 57: 147-184.

- Thorup, Cathryn (1982) A La competencia económica británica y norteamericana en México (1887-1910),@ *Historia Mexicana* XXXI Núm. 4: 599-641.
- Turlington, Edgar (1930) *Mexico and her Foreign Creditors*, New York: Columbia University Press.
- Twomey, M.J. (1993) *Multinational Corporations and the North American Free Trade Agreement* Westport: Praeger.
- (1998) A Patterns of Foreign Investment in Latin America in the Twentieth Century,@ in J. H. Coatsworth and A.M. Taylor (eds) *Latin America and the World Economy Since 1800*, Harvard: David Rockefeller Center for Latin American Studies and the Harvard University Press. A somewhat longer version in Spanish appeared as "Tendencias en la inversión extranjera en los países del tercer mundo en el siglo xx," in *Revista de Economía*, Vol. XXI Number 41, June 1998 pp. 9-60. (Lima, Peru).
- (2000) *A Century of Foreign Investment in the Third World*, London: Routledge.
- U.N. *External disequilibrium in the economic development of Latin America; the case of Mexico* E/CN.12/428
- (1965) *External Financing in Latin America*, New York: United Nations.
- United Nations Conference on Trade and Development [UNCTAD] (annual) *World Investment Report*. New York: United Nations.
- Whiting, Van R. (1992) *The Political Economy of Foreign Investment in Mexico*, Baltimore: The Johns Hopkins University Press.
- Wilkins, Mira (1988) A The free-standing company, 1870-1914: an important type of British foreign direct investment,@ *Economic History Review*, 2nd ser., 41, 2: 259-82.
- and Schröter, H. (eds) (1998) *The Free Standing Company in the World Economy 1830-1996*, Oxford: Oxford University Press.
- Zabludovsky, Jaime Enrique (1998) A La deuda externa pública,@ in Leonor Ludlow and Carlos Marichal (eds.) *Un siglo de deuda pública en México*, México: Insitituo Mora.

**Table 1. FI and GDP, Mexico Twentieth Century**

	1900	1910	1930	1940	1950	1960	1970	1980	1990	1995	1999
FI/GDP	147	110	83	#N/A	22	17	28	34	49	83	58
Debt/GDP	20	16	21	#N/A	10	8	20	29	40	58	35
FDI/GDP	127	94	63	29	12	8	8	4	9	14	15
RR-FI/GDP	57	37	24	0							
OFDI/GDP	70	57	39	29							
Private Debt/GDP							8	4	2	6	11
Portfolio FDI/GDP								0	0	10	8
Real-FDI/GDP				30	20	17	12	10	17	26	32

*Sources:*

FI and subaggregates: 1900, calculated from the totals for 1910/11, as described in the appendix; 1911, D'Olwer (1965, 1154); 1930 Alanís Patiño (1943; 101, 130). FI for 1950-1999 was calculated as the sum of debt and FDI. Debt for 1950 and 1960 from United Nations (1965, 203); 1970-1995 the total EDT from various issues of *World Debt Tables* and *Global Development Finance*. FDI: 1940-1970 from Sepúlveda and Chumacero (1973); 1980-1999 from *World Investment Report*

GDP: 1900-1960 INEGI *Estadísticas Históricas* Volume 1, Cuadro 9; 1970-1999 *International Financial Statistics*.

*Notes:* Data for FI and all sub-aggregates are values of accumulated stocks.

FDI for 1900-1930 includes private sector bonds as well as stocks; the bonds are important in railroads. OFDI is direct foreign investment, excluding railroads. OFDI also includes loans to sectors such as mining and public utilities. From 1940 on, OFDI is equivalent to FDI, as the sources used here consider the railroads to have been nationalized by then.

The notation for foreign investment in railroads is RR-FI, while Real FDI is deflated FDI.

The corresponding formulas are:  $FDI = FI - Debt$ ,  $OFDI = FDI - RR-FI$ .

The debt measure EDT for 1970-1999 includes short and long term, "public and publicly guaranteed" as well as "private non-guaranteed." As mentioned in the text, inclusion of publicly guaranteed debt in 1911 would have doubled that year's debt.

As discussed in the appendix, the variable Real-FDI was calculated by taking the estimated stock in 1940 from Sepúlveda and Chumacero (1973, Cuadro 1), and then for each subsequent year, adding the real (price deflated) value of the next year's FDI inflow to the previous year's accumulated stock of FDI, and subtracting from the total 2% for depreciation. The FDI flows for 1940-1980 were taken from *Estadísticas Históricas de México* Tomo II p. 612, and for the subsequent years from the Banco de México's webpage.

**Table 2. Foreign Investment Compared to the Capital Stock, Mexico 1910-1994**

	1910	1930	1940	1950	1960	1970	1980	1990	1994
FI/K	51	52	#N/A	11	7	10	13	13	13
FDI/K	43	39	21	6	3	3	2	2	2
OFDI/K	26	24	21						
RR-FI/K	17	15							
Real-FDI/K			21	11	7	5	3	4	6

*Sources:* FI and sub-aggregates, as in Table 1. Capital stock for 1910-1940 from Twomey (1993); for 1950-1994, Hofman (2000).

*Notes:* As discussed in the appendix, the capital stock estimates from Twomey (1993) are based on various contemporary estimates, the author's reworking of Alanís Patiño (1943), and on official censuses, especially for 1940. After adjusting for prices, the estimate for 1950 in Twomey (1993) closely corresponds to that of Hofman (2000), which is based on the perpetual inventory method.

**Table 3. Geographical Distribution of FI and FDI into Mexico by Source Countries, 1911-1990.**

(Data are percentages)

	1911 Total	1911 Debt	1911 Non-Debt	1911 RR	1911 Non-RR
U.S.A.	38	12	42	47	39
U.K.	29	17	31	36	29
Other Europe	30	71	23	14	29

Distribution of FDI

	1940	1950	1960	1970	1985	1997
U.S.A.	64	69	83	79	70	60
Canada	21	15	2	2	2	3
U.K.	9	5	5	3	4	3
Other Europe	7	10	7	13	18	20
Japan				1	3	2

*Sources:* 1911, D’Olwer (1965, ); 1940-1970, Sepulveda and Chumacero (1973), reporting Banco de México data.; 1985 and 1997, OECD *International Direct Investment Statistical Yearbook*.

*Notes:* For 1911, investment from Canada was included in the British total by D’Olwer. The category “Debt” includes only government debt. Both “RR” and “Non-RR” include bonds as well as direct foreign investment in railroads. Most of the large amount of debt to “other Europe” went to France.

**Table 4. Mexico: Sectoral Distribution of FDI, 1910-1999.**(Data are Percentages)

	1911	1940	1950	1960	1970	1985	1997
Agriculture	7	2	1	2	1	0	1
Mining	28	24	20	16	6	6	1
Petroleum	4	0	2	2	1	0	0
Manufacturing	5	7	26	56	74	78	63
Construction	0	0	1	1	0	0	1
Electricity	8	31	24	1	0	0	0
Commerce	4	3	12	18	15	3	9
Transport & Communications	39	32	13	3	0	0	2
Other	6	0	1	2	2	13	23

Sources: 1911 D'Olwer (1965); 1940-1970 Sepúlveda and Chumacero (1973); 1985 and 1997 from OECD *International Direct Investments Statistical Yearbook*.

Note: There may be inconsistencies in the classifications of the various service activities.

**Table 5. Latin America, Ratios of FI, FDI and OFDI to GDP, Twentieth Century. (Percentages)**

	1900	1913	1929	1938	1950	1970	1980	1990	1995
<b>FI/GDP</b>									
Argentina	357	229	108	87	12	26	29	42	37
Brazil	83	92	65	78	11	24	33	31	28
Chile	175	197	152	170	49	34	39	87	58
Colombia	61	25	34	35	24	21	17	51	30
Cuba	102	132	202	169	46	#N/A	#N/A	#N/A	#N/A
Guatemala	131	154	71	63	#N/A	14	20	55	33
Honduras	155	156	119	88	34	42	52	140	130
Mexico	119	126	108	51	23	25	26	48	98
Mexico (rev.)	147	110	83	#N/A	22	27	34	49	83
Paraguay	64	81	34	#N/A	#N/A	19	22	40	34
Peru	168	110	62	46	22	49	39	48	45
Uruguay	295	146	65	59	18	14	21	51	34
Venezuela	126	49	59	49	50	37	22	68	51
Total	172	145	94	82	23	25	32	48	48
<b>FDI/GDP</b>									
Argentina	216	154	68	67	7	8	7	6	9
Brazil	34	54	34	34	8	12	8	9	9
Chile	113	127	86	115	31	2	3	35	26
Colombia	53	16	21	16	17	7	3	9	9
Cuba	53	109	184	147	42	#N/A	#N/A	#N/A	#N/A
Guatemala	94	141	62	46	#N/A	8	9	23	15
Honduras	44	42	87	61	34	27	4	14	16
Mexico	101	109	69	30	12	7	4	14	28
Mexico (rev.)	127	94	63	29	12	7	4	9	14
Paraguay	42	69	30	22	#N/A	5	5	7	14
Peru	168	100	42	30	14	12	5	4	10
Uruguay	153	75	31	26	8	3	7	12	9
Venezuela	83	29	58	49	50	29	2	8	10
Total	108	104	61	56	16	9	6	11	16
<b>OFDI/GDP</b>									
Argentina	69	43	28	30	7				
Brazil	14	26	27	27	5				
Chile	66	87	74	95	28				
Colombia	44	10	20	16	#N/A				
Cuba	33	71	145	121	38				
Guatemala	7	12	19	46	#N/A				
Honduras	43	42	87	61	34				
Mexico	46	67	42	30	11				
Mexico (rev.)	70	57	39	29	12				
Paraguay	6	36	14	22	#N/A				
Peru	50	43	27	16	10				
Uruguay	83	31	13	26	8				
Venezuela	47	13	55	31	28				
Total	53	52	39	42	15				

Source: Twomey (2000), and revised Mexican data from Table 1.

**Table 6 Relative Size of Railroads in 1913**

<i>Country</i>	<i>RR km /person</i>	<i>RR km /GDP</i>	<i>Index of RR km/GDP (L.A.=1.0)</i>
Argentina	4.3	36	1.2
Brazil	1.0	36	1.2
Chile	2.4	27	0.9
Colombia	0.2	7	0.2
Costa Rica	2.5	51	1.7
Cuba	1.6	18	0.6
El Salvador	0.3	12	0.4
Guatemala	0.6	14	0.5
Honduras	0.4	10	0.3
Mexico	1.8	36	1.2
Nicaragua	0.6	17	0.6
Peru	0.7	28	1.0
Puerto Rico	0.4	5	0.2
Uruguay	2.3	18	0.6
Venezuela	0.4	na	na
Latin America Average	1.4	30	1.0*
Australia	6.9	15	0.5
Canada	6.5	18	0.6
Algeria	0.6	10	0.3
Egypt	0.4	7	0.2
Ghana	0.2	3	0.1
Morocco	0.1	2	0.1
South Africa	2.0	19	0.6
China	<0.1	1	<0.1
India	0.2	8	0.2
Indonesia	0.1	9	0.3
Malaysia	0.5	9	0.3
Philippines	0.1	2	0.1
Thailand	0.1	6	0.2
Turkey (Ottoman Empire)	0.3	5	0.2

*Sources:* For Latin America, author's calculations using data in Bulmer-Thomas (1994: 107, 432, 444). Others from the sources in the country studies in Twomey (2000).

*Notes:* The unit for column 2 is kilometers per thousand people; for column 3 it is kilometers per million U.S. dollars in 1913 prices. The data for GDP for the Latin American countries was calculated from Bulmer-Thomas's GDP/cap data and population; the conversion from 1970 dollars to 1913 dollars involved dividing by 4.5, the ratio for the U.S. GDP deflator. \* indicates overall average; the total in Bulmer-Thomas is inconsistent with the data for individual countries. That the level of railroad kilometers/GDP for Argentina in this table is 75 percent higher than in the corresponding Graph results from the latter's use of the actual GDP, from Cortés Conde.

**Table 7. Twentieth Century Trends in Average Foreign Investment Ratios, Third World Countries**

<i>Year</i>	<i>FI/GDP</i>	<i>FDI/GDP</i>	<i>FDI/GDP in:</i>	
			<i>Colonies</i>	<i>Independent Countries</i>
1914	94	40	42	36
1930s	96	51	61	37
1950s	53	30	35	17
1970	32	13	14	9
1995	86	18	19	14

*Source:* Twomey (2000)

*Note:* The FDI in 1914 is non-railroad FDI. The number of countries varies by year; there are fewest observations for 1950, and there were several cases for the late 1930s when different sources provided dramatically different results. The *World Investment Report 1997* reports ratios of FDI/GDP for the entire Third World, which rise from 4.3 percent in 1980 to 15.4 percent in 1995.

**Table 8 Wealth Ratios, Twentieth Century.**

<i>Argentina</i>	<i>1909</i>	<i>1913</i>	<i>1927</i>	<i>1940</i>	<i>1953</i>			
FDI/(K+T)		27						
FDI/K	28	38	27	15	5			
Non-RRFDI/K	14	22	15	4	5			
<i>Brazil</i>	<i>1913</i>	<i>1929</i>	<i>1938</i>	<i>1950</i>	<i>1970</i>	<i>1980</i>		
FDI/(K+T)	9	9		4	2	2		
FDI/K	17	16	14	6	3	3		
<i>Chile</i>	<i>1927</i>	<i>1932</i>	<i>1937</i>	<i>1942</i>	<i>1947</i>	<i>1951</i>		
FI/K	36	52	40	25	21	21		
FDI/K	24	33	27	15	14	15		
<i>Colombia</i>		<i>1929</i>		<i>1950</i>				
FI/K		12		7				
FDI/K		7		5				
<i>Cuba</i>	<i>1913</i>			<i>1957</i>				
FDI/K	38			19				
<i>Honduras</i>	<i>1925</i>	<i>1929</i>	<i>1938</i>	<i>1950</i>	<i>1955</i>			
FDI/K	27	26	14	15	17			
<i>Mexico</i>	<i>1910</i>	<i>1930</i>	<i>1940</i>	<i>1950</i>	<i>1960</i>	<i>1970</i>	<i>1980</i>	<i>1994</i>
FDI/(K+T)	32	26	17	4	3			
FDI/K	42	33	21	5	3	5		
FDI/K <i>revised</i>	43	39	21	6	3	3	2	2
<i>Venezuela</i>		<i>1929</i>	<i>1938</i>	<i>1950</i>	<i>1967</i>	<i>1969</i>		
FDI/K		45	33	28	16	17		
<i>Egypt</i>	<i>1914</i>	<i>1929</i>	<i>1936</i>	<i>1948</i>				
FI/W	27		14	6				
FI/(W-T)	71		36	14				
FDI/W	12	8	6	<1/2				
FDI/(W-T)	32	22	16	14				
<i>Ghana</i>	<i>1911</i>			<i>1960</i>				
FDI/K	<50			7				
<i>India</i>	<i>1911</i>	<i>1929</i>	<i>1938</i>	<i>1948</i>	<i>1960</i>	<i>1970</i>	<i>1980</i>	

FDI/(K+T)		3	2	3	1	1	<1/2	<1/2	
FDI/K		7	7	8	2	2	<1/2	<1/2	
<i>Korea</i>		<i>1914</i>	<i>1920</i>	<i>1929</i>	<i>1938</i>				
FDI/K		9	12	17	25				
<i>Taiwan</i>		<i>1914</i>	<i>1920</i>	<i>1926</i>	<i>1929</i>	<i>1938</i>			
FDI/K		20	25	32	26	28			
<i>Australia</i>	<i>1900</i>	<i>1914</i>	<i>1929</i>	<i>1938</i>	<i>1947</i>	<i>1960</i>	<i>1970</i>		
FI/K		134	109	115		18			
FDI/K	7	6	5		5	4	4		
<i>Canada</i>	<i>1900</i>	<i>1913</i>	<i>1926</i>	<i>1930</i>	<i>1939</i>	<i>1950</i>	<i>1960</i>	<i>1970</i>	<i>1980</i>
FI/K	34	33	28	31	28	15	17	17	14
FDI/K	9	6	8	9	9	6	9	9	5
<i>South Africa</i>	<i>1910</i>	<i>1913</i>	<i>1930</i>	<i>1935</i>	<i>1938</i>	<i>1950</i>	<i>1956</i>	<i>1970</i>	<i>1980</i>
FI/W		30	11	15	6		9		
FI/K	110	102	34	68	21	14	40	28	16
FDI/W		20	5	9	3		5		
FDI/K	74	69	16	39	11	12	23	19	8

*Notation:* FI and FDI are foreign investment and foreign direct investment. W is total wealth, T is the value of land, and K is the capital stock, usually including residential.

*Source:* Twomey (2000), and revised estimates for Mexico using the data from Table 1.

*Notes:* The data on wealth, capital stock, and land are based on national sources, which of course did not follow a homogeneous methodology. At best, these sources added up the estimated values for each sector, as provided by national censuses, of which Goldsmith (1984) is a standard example.

It can be argued that in several colonies (Indochina, Algeria) the value of enterprises owned by settlers, and financed locally, was greater than the value of funds brought in from the metropolitan country. In addition, it has always been recognized that non-Europeans (and non-Japanese) have made significant investments in countries in which they were nominally “foreigners.” Ethnic Chinese in south-east Asia, people from the Indian sub-continent in East Africa, and emigrés from the Ottoman empire are the most familiar examples. Thus in these non-Latin American examples, a non-qualified conceptualization of “foreign investment” is inadequate.

**Table 9 Stocks of Inward and Outward FDI/GDP, 1980-1998 (Percent)**

	<i>1980</i>	<i>1990</i>	<i>1998</i>
Australia			
Inward FDI/GDP	9	25	28
Outward FDI/GDP	2	11	17
Net Inward FDI/GDP	7	14	11
Canada			
Inward FDI/GDP	21	20	24
Outward FDI/GDP	9	15	27
Net Inward FDI/GDP	12	5	-3
South Africa			
Inward FDI/GDP	21	9	13
Outward FDI/GDP	7	14	25
Net Inward FDI/GDP	14	-6	-12
Korea			
Inward FDI/GDP	2	2	6
Outward FDI/GDP	<½	1	7
Net Inward FDI/GDP	2	1	<-½
Malaysia			
Inward FDI/GDP	21	24	67
Outward FDI/GDP	1	6	23
Net Inward FDI/GDP	20	18	44
Taiwan			
Inward FDI/GDP	6	6	8
Outward FDI/GDP	<½	8	15
Net Inward FDI/GDP	36	-2	-7
Argentina			
Inward FDI/GDP	7	6	14
Outward FDI/GDP	8	4	5
Net Inward FDI/GDP	-1	1	9
Brazil			
Inward FDI/GDP	7	8	17
Outward FDI/GDP	<½	1	1
Net Inward FDI/GDP	7	8	16
Chile			
Inward FDI/GDP	3	33	40
Outward FDI/GDP	<½	1	12
Net Inward FDI/GDP	3	32	28
Mexico			
Inward FDI/GDP	1	9	14
Outward FDI/GDP	<½	<½	1
Net Inward FDI/GDP	1	8	13
Venezuela			

Inward FDI/GDP	3	5	20
Outward FDI/GDP	0	5	6
Net Inward FDI/GDP	3	0	14

*Sources:* *World Investment Report 2000* Annex Table B.6, and author's calculations.

*Note:* Numbers may not add up because of rounding.