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The Development of Quantitative History in Mexico since 1940: Socioeconomic Change, Income Distribution, and Wages

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Half a century of change has radically transformed the Mexican economy. Fifty years ago the country was rural and agrarian; today it is urban and industrial. Fifty years ago the government struggled with agricultural reform and campesino organization; today the government struggles with industrial reform and labor organization. Prior to World War II the most dynamic industries were located in the export sector; after the war the new dynamic sectors primarily sold to the domestic market.

Though postwar Mexican industrialization evolved from the Porfirian industrial structure, it developed a quite different dynamic. Late nineteenth- and early twentieth-century Mexican industrialization tended to be complementary to the country's true dynamic sectors—export mining and oil—and also tended to be located in “simple” consumer goods—processed foods, textiles, glass. After World War II giant multinationals began to invest in Mexico's emerging and increasingly protected domestic market. New industries appeared and the older ones adapted. The multinationals brought new technologies to new industries at the same time that they transformed older ones. Gradually automobiles, tires, pharmaceuticals, electronics, chemical goods, artificial fibers, and other new consumer durables and non-durables replaced mining and oil as Mexico's “leading sectors.”

While the multinationals dominated the advanced sectors, Mexican investors either associated with them in establishing the new businesses, or invested in complementary establishments. For example, the multinationals built virtually all of Mexico's cars while Mexican investors participated in the auto parts industry. At the same time many of the older industries, located in consumer non-durables, continued to flourish as the domestic market expanded. This system created a consensus among foreign and national business elites, while its wealth provided subsidies to many other sectors of the population.

The postwar industrialization process transformed social structures. In 1930 Mexican agriculture was responsible for almost as much value added as mining and industry (includ-

ing construction and generation of energy). In addition, more than three and a half million Mexicans labored in the countryside while only three quarters of a million worked in industry. Half a century later the situation was quite different. By 1980 agricultural GDP dropped dramatically in relation to industry: 9 percent of GDP as opposed to 35 percent respectively. In 1930 66.5 percent of the population was rural and 33.5 percent was urban; by 1980 the percentages had been reversed, with 33.7 percent rural and 66.3 percent urban. As the economy grew a modern banking and commercial system developed, infrastructure spread, and the educational system exploded. Mexico became an urban and industrial country.

Industrial growth, however, did not reach everybody nor did it better the lives of all those it affected. The numbers of the urban poor grew and general stagnation took over the countryside. During the 1940s it was noted that most rural dwellers were poor, and by 1980 that had not changed. Though agriculture generated only 9 percent of GDP in 1980, some 40 percent of the labor force was employed in that area, indicating the depth of the poverty. During those same forty years Mexico made the sad transition from a food exporter to a food importer. The contrast between the country's increasing wealth and growing numbers of poor people, both urban and rural, led many to believe that development brought worsening levels of income inequality.

Other analysts pointed toward increasing external sector deficits and a growing reliance on foreign loans to cover those deficits as the true weakness of the system. Still others pointed to unbalanced industry, strong on consumer goods and weak on capital goods, as a sign that the country was growing but not developing. Critics on the left pointed to foreign control of the advanced sectors and “denationalization” of culture.

Within Mexico the study of the country's changing economy grew apace. Mexican scholars had to engage in the threefold process of developing the new academic profession of Economics, participating in the development process within government, and carrying out a vigorous debate on the new Mexican economy. The National School of Economics of the Universidad Nacional Autónoma de México had only recently been founded, in 1934. Early self-taught economists such as Jesús Silva Herzog, associated with the school's beginnings, initiated trends that were to last for

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decades. Silva Herzog wrote economic histories. Since then most recent economic history in Mexico has been written by economists rather than historians. Silva Herzog participated in government, and most high-level Mexican economists have continued to move back and forth between the university and the public sector in contrast to the United States model of a purely academic career. Silva Herzog often defied conventional economic theory, and so did many later Mexican economists. In fact, two conflicting traditions would emerge: a left, university, essayist tradition, and a more orthodox, technical, governmental tradition.

The left, university tradition would often generate critical essays lacking in quantitative support. The orthodox, governmental tradition would often generate quantitative, technical studies that rarely commented on larger, economic issues. For many years broad economic studies or economic histories with a largely quantitative foundation would be lacking. In part this was natural during a period when the government was only beginning to develop the statistical indicators necessary for a more sophisticated understanding of the development process.

The more orthodox, governmental tradition began generating narrow, technical studies that were later to evolve into wider, econometric studies. In the 1940s Pedro Merla, Federico Bach, and Margarita Reyna published articles on their pioneering efforts to generate new official price indexes.¹ These articles emerged from previous traditions within Mexico, one dealing with earlier price indexes, the other from the 1920s concern with workers' cost of living. The authors carried out important quantitative research but stuck to their subject matter; larger criticisms of the Mexican economy were still left to the essayists.

By the 1960s Mexican social scientists, generally led by the economists, were becoming more interested in using quantitative studies to strengthen their larger analyses of Mexican society. The new quantitative studies were more integrative and interpretive than even the more recent price, wage, and income analyses. The two watershed books of the decade—*La democracia en México* by Pablo González Casanova (1965) and *La realidad económica mexicana: retrovisión y perspectivas* by Leopoldo Solís (1970)—still stand out as broad statements whose magnitude has not been equaled to date.²

¹ Pedro Merla, "El costo de la vida obrera en México," pamphlet of the Secretaría del Trabajo y Previsión Social, Mexico, 1942; Federico Bach and Margarita Reyna, "El nuevo índice de precios al mayoreo en la ciudad de México de la Secretaría de la Economía Nacional," *El Trimestre Económico* 10:37 (1943), 1-63.

² Pablo González Casanova, *La democracia en México* (Mexico: Ediciones Era, 1965); Leopoldo Solís, *La realidad económica mexicana: retrovisión y perspectivas* (Mexico: Siglo Veintiuno, 1970).

Prior to 1960 economic analyses constituted the majority of the quantitative studies that existed on modern Mexico in the realm of the social sciences. The decade of the 1960s brought a radical change in this situation as social scientists of all kinds attempted to quantify their analyses. This interest continued to grow through the 1970s, permitting increased methodological sophistication. In the 1980s, however, concern with the economic crisis overshadowed other themes in the literature. This study describes some of these shifts in focus of quantitative studies on Mexico from the 1940s to the 1980s.

This description will highlight three elements: (1) quantitative studies on Mexico; (2) income distribution studies; (3) price and wage studies. This survey of the literature will show that the Mexican government has generated the vast majority of the country's social and economic statistics. It will also show that the government has played a significant though not unbiased role in the analysis of these same data. Finally, it will be noted that in the last twenty-five years economists have continued to dominate the quantitative field in spite of the recent entry of other social scientists.

Methodologically, the survey of the literature will indicate that most studies have employed published rather than unpublished or archival statistics. While some authors have used the published data in new ways, the lack of raw data has limited their analyses. The use of a few broad categories has often limited our understanding of Mexico's socioeconomic development, especially with respect to the wage problem.

Mexico's Official Statistics

Within the ministries of the Mexican government, the basic budgetary and work units are the bureaus or departments (*direcciones*). Many, if not most, of these departments generate quantitative data of an economic, social, or technical nature on a permanent basis. Much of the data never leave the department. Nonetheless, the government does centralize and publish some of it. By law, a single department, the General Bureau of Statistics (*Dirección General de Estadística*, or DGE), carries out these functions. The DGE publishes most of Mexico's official statistics, although other bureaus and agencies publish some of their own data. The Bureau of Statistics was founded in 1882 as part of the Ministry of Development (*Secretaría de Fomento*), later formed part of the Ministry of the National Economy (*Secretaría de la Economía Nacional*) in the 1930s, then from the 1940s to the 1970s belonged to the Ministry of Industry and Commerce (*Secretaría de Industria y Comercio*). José López Portillo's *Reforma Administrativa* put an end to the Ministry of Industry and Commerce and sent the Bureau of Statistics

to the newly created Ministry of Planning and the Budget (Secretaría de Programación y Presupuesto).³

It is typical of the Reforma Administrativa that it shuffled departments between ministries rather than create or suppress them. The structure of the Mexican executive determines that the departments such as the DGE have a longer administrative life than the ministries of which they are a part. For example, the Secretaría de Fomento, the Secretaría de la Economía Nacional, and the Secretaría de Industria y Comercio no longer exist, although their bureaus continue in other and newer Secretarías. The obvious reason is that each department generally has a single and indispensable function. The actual grouping of these functions within the overall administrative structure is less important than the functions themselves. This factor has additionally permitted more statistical continuity than one would imagine given the rather high mortality rate of the ministries.

While the Bureau of Statistics has usually functioned well as a centralized publishing agency, historically it has been less efficient in gathering data generated by other government departments. The Bureau has had a tendency to publish its own information first, only secondarily relying upon data generated by others. In order to correct this bias, the Reforma Administrativa created the General Coordination of the National Information System (Coordinación General del Sistema Nacional de Información, or CGSNI). The Coordination, part of the Ministry of Planning and the Budget, is responsible for integrating all of the government's statistics within a comprehensive plan. The Bureau of Statistics constitutes only a subset of the General Coordination, and the director of the former is a subordinate of the director of the latter, although history indicates that the Bureau will outlive the CGSNI.

The Coordinación General generates no new quantitative data of its own. Instead, it oversees the statistical efforts of other government agencies whose quantitative data represent only a by-product of their main functions. When founded, the agency began to publish some of the statistics in its new journal, *Información sobre información*, as well as in other publications, both regular and occasional. The first issue of *Información* dealt almost entirely with price indices, and served as a major source for this essay. The

³ For a brief history of the Dirección General de Estadística, see its *Anuario Estadístico de la República Mexicana*, 1930 (Mexico, 1932); Rubén Gleason Galicia, *Las estadísticas y los censos de México* (UNAM, 1968); and Mexico, Secretaría de Programación y Presupuesto, Coordinación General del Sistema Nacional de Información, *Catálogo histórico de publicaciones 1884-1977* (Mexico, 1978). Gleason Galicia is a former director of the Dirección.

Since these names are repeated quite often, hereafter I refer to the Dirección General de Estadística as the DGE, the Secretaría de Programación y Presupuesto as the SPP, and the Coordinación General del Sistema Nacional de Información as the CGSNI. For all official publications, Mexico is to be understood.

third issue discussed wages and income distribution, and was similarly useful.⁴

The Bureau of Statistics, unlike the Coordinación General, not only centralizes and publishes statistical data, but also generates them. It carries out the government's censuses and a number of its surveys. The Bureau's publications combine original data with those generated by other agencies.

Besides the censuses, all of which are published, the Bureau's most important publication is the *Anuario Estadístico de los Estados Unidos Mexicanos*. Although the government has published the *Anuario* since 1893, it has only done so regularly since 1930. For the last ninety years the *Anuario* has sometimes appeared yearly and sometimes every two years, although the recent tendency has been toward yearly publication. Its data cover a wide variety of topics, including population, housing, industry, education, commerce, and finance. The Bureau generates some of the data and other government agencies the rest, although the Bureau organizes all of the data for publication. The *Anuario* has always published excellent price data. For this study, every *Anuario* since 1930 was consulted.⁵

The Bureau of Statistics produces other regular and occasional publications in addition to the censuses and the *Anuario*, such as the *Anuario de Comercio Exterior* and *Estadística Industrial Mensual*. Although not directly relevant to this study, they constitute important sources for quantitative studies of modern Mexico.

Another of the Bureau's regular publications does have direct relevance, however. Since 1938 in the Federal District, and since 1939 in the rest of the country, the DGE has carried out the country's most important annual wage survey, *Trabajo y Salarios Industriales*.⁶

⁴ SPP, CGSNI, *Información sobre información* (Mexico) 1:1 and 3 (1977, 1978). Hereafter I refer to this journal as *Información*.

⁵ See, for example, SPP, CGSNI, *Anuario Estadístico de los Estados Unidos Mexicanos 1975-1976* (Mexico, 1979). Although the Mexican government publishes other kinds of *anuarios*, the general *Anuario Estadístico* is the principal one that I have employed for this study. Hereafter I refer to it simply as *Anuario* followed by the date contained in the title rather than publication date. For example, the one mentioned here would simply be *Anuario 1975-1976*.

I have used the following: 1930, 1938, 1939, 1940, 1941, 1942, 1943-1945, 1946-1950, 1951-1952, 1953, 1954, 1955-1956, 1957, 1958-1959, 1960-1961, 1962-1963, 1964-1965, 1966-1967, 1968-1969, 1970-1971, 1972-1974, 1975-1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985.

⁶ DGE, *Trabajo y Salarios Industriales* (Mexico), various years. As with the *Anuario*, the survey contains a data date as part of the title as well as a date of publication. Hereafter I refer only to the data date. I have used the following published surveys for this study: 1939, 1940 (April), 1941 (April), 1942, 1943, 1944, 1945-1946, 1947, 1949, 1950, 1953, 1955, 1956, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984. When referring to the published survey, I shall simplify the title to *Trabajo* plus the data date.

The Bureau produces other documents with systematic wage information. The industrial census includes wage and salary totals for each industry in Mexico. They are normally published every five years. The DGE also generates monthly and yearly industrial surveys that cover some aspects of wages, though less than *Trabajo y Salarios Industriales*. In *Información sobre información, edición especial*, the Coordinación General used to publish a list of the government's wage and price surveys.⁷

The Dirección General de Estadística generates and publishes more quantitative data than any other government entity, but others still continue to play an important role. For economic statistics, the most important of these is the Bank of Mexico (Banco de México). The Bank's Subdirección de Investigación Económica has a long tradition of data gathering. Unlike the Bureau of Statistics, however, historically the Bank has produced more data than it has published. The Bank has had a role in economic planning, and thus has had to produce information for internal use, while the DGE has no internal planning role of its own. Despite this difference, the Bank's statistical publications are valuable sources, ranging from the monthly *Indicadores económicos* to the published input-output tables for the Mexican economy, recently a joint effort of the Bank, the CGSNI, and the United Nations.

The Bank has played a particularly strong role in generating price indices. Originally published in the Bank's *Informe Anual*, more recently these data have appeared in the monthly *Indicadores económicos*, as well as *Índices de precios*.⁸ The Bank participates in the production of the *National Accounts*, which includes wage and price data of a different nature.

In addition to the Bank of Mexico, the National Minimum Wage Commission (Comisión Nacional de los Salarios Mínimos, or CNSM) generates systematic price and wage data. Mexico has had a system of minimum wages since 1934. The tripartite CNSM carries out the technical studies prior to the government's minimum wage recommendations. Recently the Commission published its regional price indices as well as the legal minimum wages that will be in effect for the year; these publications constitute important price and wage series.

The four institutions—the Coordinación General, the Dirección General de Estadística, the Banco de México, and the Comisión Nacional de los Salarios Mínimos—have generated and published the bulk of systematic price and wage

data for the last fifty years. For shorter periods, other agencies, such as Nacional Financiera or Pemex, have presented their own price and wage data. As historical sources, however, they lack the continuity of the other four. In addition to the systematic data, there exists an immense quantity of randomly generated price and wage data in places such as newspaper, business, and union archives. These sources are more relevant to studies of individual branches rather than broad comparisons of the entire industrial sector, however.

For the last fifty years the Mexican government has generated increasingly sophisticated, usable statistical data. Social scientists who have studied modern Mexico have had increasing access to these data. The sophistication of their studies has paralleled that of the data themselves. Thus we can now turn to the uses that social scientists have made of these materials in order to analyze the progress of statistical research on modern Mexico.

Four General Studies

Pablo González Casanova published *Democracy in Mexico* in 1965, and the book was immediately received as an important and influential contribution. The author, a former president of Mexico's National University, broke with the Latin American tradition of the political essay based as much upon intuition as upon facts, and attempted to interpret the Mexican political system in terms of hard data about the economy and the society. Much of the "hard data" is presented in an extensive statistical appendix of thirty-four tables, the majority arranged as time series. Although the book has been criticized for insufficient ties between the quantitative information and the substantive arguments, the mere presentation of the statistics established a step forward in Mexican sociology. The tables range from the economic (foreign investment 1938 to 1957) to the sociological (religious affiliation 1930 to 1960) to the political (presidential voting 1910 to 1964). Rather than the book's substantive arguments, what concerns us here is the way the author constructed his time series.

Typical of pioneering efforts, *Democracy in Mexico* takes a somewhat primitive approach to sources and categories. There is no methodological discussion whatsoever, and the quantitative sources are often not clearly listed. Sometimes the tables show the government documents from which the data have been extracted. In other cases, they only refer to some of the statistical organizations mentioned in the previous section, such as the Dirección General de Estadística.

One would imagine that there is a difference between citing a source such as the *Anuario*, one of the DGE's publications, and citing the DGE itself. The use of the latter gives the impression that the data represent some of the Bureau's unpublished, archival information. However, a careful examination of the tables that use institutional sources shows that the data are in fact from the institution's published documents, although the author may have

⁷ SPP, *Información, edición especial* 2:1 (1978).

⁸ Banco de México, S.A., *Informe Anual* (Mexico, various years). In particular, the following *Informes* have been useful: 1928, 1930, 1932 (referring to the seventh, eighth, ninth, and tenth assemblies), 1932 (the eleventh assembly), 1934, 1935, 1936, 1937, 1938, 1939, 1940, and 1941. These dates refer to year of publication. The following dates refer to data years: 1944-1945, 1949-1950, 1953-1955, 1976.

Banco de México, S.A., Subdirección de Investigación Económica y Bancaria, *Indicadores económicos* (Mexico, various years), beginning with Vol. 1, No. 1 (December 1972).

introduced some new calculations, such as percentages. González Casanova seems primarily to have limited his sources to official, published documents.

Sticking to the published categories limits the generation of time series. These series must necessarily employ unchanging categories or, in other words, unchanging definitions. In reality, the Mexican government, as all governments, has been constantly modifying these through the years. Series based upon official, published documents tend to use those categories that have remained constant, discarding the others. Not only does much good data get ignored, but also the constant definitions are usually the most inclusive, often precluding more detailed analyses.

This problem often occurs, for example, when researchers must separate the economy into its component sectors. González Casanova divides the Mexican economy into five sectors. One of these—industry—he further divides into four branches. A single branch is all of manufacturing, a quite inclusive category indeed. The author can provide no further sectoral breakdown for his long time series since the definitions of “industry” have changed so greatly through the years. Their only common denominator is “manufacturing.” A common trait of quantitative studies on modern Mexico is their employment of either long series with general categories, or short series with more precise categories.

González Casanova includes two tables on income distribution and none on real wage evolution in the statistical appendix. Using published data from an international economic commission as well as from Nacional Financiera, he shows that Labor’s share of the national income dropped from 30.4 percent in 1939 to 21.4 percent in 1946. There is then a steady rise to 31.4 percent in 1960.⁹ With family income distribution, he shows that 26 percent of Mexican families earned 300 pesos a month or less in 1960-61, whereas about 3 percent of the families enjoyed incomes of 3,000 pesos a month or greater. The data lead the author to conclude that “during 1961-1962 only one out of every five Mexican families had a modest or better standard of living.”¹⁰

Whereas *Democracy in Mexico* uses statistics in order to strengthen substantive arguments, James Wilkie’s *The Mexican Revolution* stands as an essentially quantitative study. Here the author proposes to identify the ideology and the performance of the Mexican Revolution by constructing time series that measure the orientation of government spending, as well as relative regional poverty.¹¹ Unlike González Casanova, Wilkie generally uses unpublished sources, including audit data that few knew existed, even within the government. He also employs a greater variety of sources. Further, Wilkie’s time series are not mere repeti-

tions of those published by government organizations, but are often based on obscure annual reports by the various ministries whose data Wilkie was the first to organize in series form.

The use of a wider variety of sources does not represent the book’s major methodological contribution, however. This lies in the way the author has constructed his series. Each year the Mexican government publishes its budget according to current categories. Wilkie took the hundreds of categories that had been employed over the years, then grouped them according to type of spending: economic, social, or administrative. This resulted in completely new historical series from 1910 to 1963 (in some cases the series extend further than 1910). Similarly, the Poverty Index employs previously published census data, which have been rearranged according to new criteria. It should be noted that this kind of information reclassification can only move in the direction of smaller categories to larger ones.

The author of *The Mexican Revolution* increased the possibilities of generating time series with Mexican data by not restricting himself to the historically given categories. One may disagree with some of the new categories that Wilkie invented, but he was able to employ the historical statistics in a much freer way than González Casanova.

In the book, Wilkie states that the process of reclassifying the numbers also has the advantage of permitting one to be more critical with the data. In fact, the new Wilkie series, primarily the government spending and poverty series, do reflect a critical attitude toward the sources, whereas those series that are basically repetitive tend to be uncritical. For example, the author presents a table with the number of strikes and strikers in the country from 1920 to 1963, reprinting data from the *Anuarios*.¹² The Dirección General de Estadística does not generate its own labor statistics. Instead, it relies upon national and local Boards of Conciliation (Juntas de Conciliación y Arbitraje). Previous studies have demonstrated that from 1940 to 1957 the Boards either did not report data, or when they did, seriously underestimated them, often by as much as 90 percent.¹³ Wilkie employs data that came from the Conciliation Boards without undergoing substantial modification by the Bureau of Statistics. If Wilkie would have taken this into account, his strike series would have changed dramatically. But this only proves him right. It is difficult to be critical with data that one has not reworked.

While the book is neither a wage nor an income study, it does contain a table showing the evolution of real wages from 1934 to 1963. The author uses the urban legal minimum for his nominal wages series, and the Mexico City wholesale price index as his deflator. Converting the real wages to index form with 1940 = 100, table 8-3 shows

⁹ Pablo González Casanova, *Democracy in Mexico* (New York: Oxford University Press, 1970), pp. 222 and 239.

¹⁰ *Ibid.*, p. 109.

¹¹ James W. Wilkie, *The Mexican Revolution: Federal Expenditure and Social Change since 1910* (Berkeley: University of California Press, 1970).

¹² *Ibid.*, p. 184.

¹³ Jeffrey Bortz, “Problemas en la medición de la afiliación sindical,” *Azcapotzalco* 1:1 (September-December 1980), 29-66.

that the wage level stood at a high of 109.1 in 1934-35. There follows a steady decline to 100.0 in 1940, and to 66.9 in 1944-45. After some irregular movement, a new low of 65.6 is reached in 1950-51. In 1952-53 the index jumps sharply to 104.5. The wage level then continues to rise, reaching 138.9 in 1962-63.¹⁴

Wilkie's social Poverty Index shows a linear movement quite distinct from the real wage trend. Setting 1940 = 100, the index descends to 85.7 in 1950, and to 72.0 in 1960.¹⁵ Ignoring the 1934 to 1951 wage decline, the author states that his poverty index "indicates that the revolution was very much alive, and that Mexico experienced its most rapid social change for the masses between 1940 and 1960."¹⁶

My own data show that real wages are higher in the 1960s than in the 1940s, but according to Wilkie's wage data, they dropped considerably in the 1940s. González Casanova's data also indicated that this was a period of worsening income distribution. Wilkie's Poverty Index shows improvement because it deals with noneconomic aspects of poverty. Wilkie's novel use of government statistics, as well as the new information that he provides, mark a turning point in quantitative studies on modern Mexico.

The books by González Casanova and Wilkie represented high points in the 1960s trend toward more quantification in the analyses of Mexico, a trend culminated by the publication of two major economic histories in 1970. Leopoldo Solís's *La realidad económica mexicana* and Clark Reynolds's *The Mexican Economy* are landmark studies, similar in structure and intent. The two authors gathered together as much economic data as possible, summarized the most relevant monographs, and generally presented the accumulated knowledge to that time to explain Mexico's development. Both books base their substantive arguments on the statistics. The quantitative data are usually organized in time series, with some use of econometric models. One may disagree with the books' basic theses—I certainly do, and there is some indication that Reynolds, at least, came to change his opinions in the decade that followed—but their scope has yet to be equaled.¹⁷

In addition to their qualitative arguments, both studies made a contribution to the quantitative analysis of modern Mexico. Solís, unlike Reynolds, tends to ignore his sources. The statistical tables resemble those employed by González Casanova, citing only published documents and institutional sources. An examination of the tables that list institutional sources indicates that the author has employed data from the institution's published journals or from monographs of limited circulation, but has not used new, archival sources. Nor does Solís engage in the kind of reorganization of cate-

gories that Wilkie employed three years earlier. This limits his time series to the given definitions, which also means that the long series can only employ the most general categories. For example, his tables showing the country's economic growth since 1895 employ the same seven sectors (manufacturing, mining, etc.) that were used by González Casanova. The reason is that they are long series based exclusively on published statistics.¹⁸ *La realidad económica mexicana* does contain more specific tables with respect to the industry branches, but these are based upon the National Accounts. Since the National Accounts System dates from 1950, the series that use them also begin in that year.

Solís discusses income distribution at length. As of 1967 there existed two series on the functional distribution of income, the first covering 1939 to 1950, the second 1950 to 1967.¹⁹ The book reproduces the data from these sources, one of which is the same international commission that González Casanova cited, while the other is the Bank of Mexico's National Accounts for 1950-67. Although the categories from the two sets of data are only roughly compatible, they show that Labor received only 30.5 percent of GDP in 1939. From 1940 to 1946, the percentage drops, reaching a low of 21.5 percent in the latter year. This figure then slowly rises, to 29.8 percent in 1959, and to 31.2 percent in 1960, the first year that it surpasses its 1939 level. By 1967 the figure stands at 33.3 percent, barely a third of national income.²⁰

The book presents only one real wage table, showing the mean annual rate of change in different periods, from 1877 to 1967. The table lists the Bank of Mexico as its source, but the nominal wages are the daily legal minimum (as in Wilkie), which appear to have been deflated by a composite wholesale price index (also as in Wilkie) since that is the only published price series for the Porfiriato.²¹ In any case, it is safe to assume that Solís did not employ archival data for the early part of his price index, since his source, the Bank of Mexico, did not then exist.

According to his data, real urban minimum wages rose at an annual rate of .3 percent from 1877 to 1910. During the last fifteen years of the Porfiriato, from 1895 to 1910, real wages declined .7 percent yearly. There are no data from 1910 to 1935. From 1936 to 1946, real wages fall at an annual rate of 5.4 percent. The average yearly rise from 1946 to 1956 is 2.3 percent, accelerating to 4.6 percent from 1957 to 1967.

¹⁴ Wilkie, *Mexican Revolution*, p. 187.

¹⁵ *Ibid.*, p. 234.

¹⁶ *Ibid.*, p. 277.

¹⁷ Leopoldo Solís, *La realidad económica mexicana: retrovisión y perspectivas* (Mexico: Siglo XXI, 1973); Clark W. Reynolds, *The Mexican Economy* (New Haven: Yale University Press, 1970).

¹⁸ Solís, *Realidad económica*, p. 111.

¹⁹ *Ibid.*, p. 307. The first series can be found in Raúl Ortiz Mena, Víctor L. Urquidí, et al., *El desarrollo económico de México y su capacidad para absorber capital del exterior* (Mexico, 1953). The second can be found in Banco de México, S.A., Departamento de Estudios Económicos, *Cuentas nacionales y acervos de capital, consolidadas y por tipo de actividad económica 1950-1967* (Mexico, 1969).

²⁰ Solís, *Realidad económica*, p. 318 and table VII-8. Also, *Cuentas Nacionales 1950-1967*, tables 1-18.

²¹ Solís, *Realidad económica*, p. 289.

While this ninety-year table is considerably longer than that presented by Wilkie, it is somewhat artificial. Presenting the mean annual change in different periods avoids showing actual wage levels, which might have been more difficult since he would have had to integrate the historical data, especially the price series. Nonetheless, for the years in which this information coincides with that on income distribution, one notices a rough correspondence. Real wages decline in the same period that income relative to Labor was falling, and rise when Labor's share of GDP was increasing.

Like Solís's *La realidad económica mexicana*, Clark Reynolds's *The Mexican Economy* is an important summary of the main issues. Unlike Solís, however, Reynolds explicitly deals with the problem of sources. On the quantitative data, he states,

With the above qualifications in mind, the present study introduces a secular analysis of the process of growth and structural change of the Mexican economy in terms of the best statistical indicators currently available. Rates of growth of input and output are accepted as reasonably accurate, although the absolute levels of many of the statistics are considered to be subject to significant margins of error.²²

Here Reynolds addresses a problem that Solís and González Casanova ignored. Many experts consider Mexican government statistics to be either manipulated or faulty. According to Reynolds, the Mexican data suffer from serious deficiencies that often render absolute values misleading. Nonetheless, correlated series suggest that many indicators often move in a similar direction.

While absolute levels of alternative indicators may show wide differences at any point in time, their real rates of growth (with the exception of gross investment data) tend to be comparable, especially for periods of a decade or longer. Errors in the estimators therefore appear for the most part to be serially correlated, minimizing disturbances in the analysis of growth.²³

Although Solís did not point this out, his own wage and income series confirm it. Reynolds's argument leads to the conclusion that arranging the quantitative data in time series permits an analysis of trends along with the absolute values, and that the former tend to be more valid than the latter.

Reynolds constructs his time series using a large number of published and unpublished studies, including the major government statistical documents. Indeed, his book constitutes one of the more exhaustive collections of quantitative data on the Mexican economy. However, the author neither changes categories in order to build completely new series,

as did Wilkie, nor uses archival data to generate new information.²⁴ This results in series that suffer from the same limitations that we observed in the previous book. For example, his table on the structure of production from 1900 to 1965 employs the industry definitions found in González Casanova and Solís; like them, he presents no internal division of the manufacturing sector. The tables with more detailed industrial breakdowns always cover the period after 1950, when the National Accounts are available. In other words, the long series are not detailed, and the detailed series are not long.²⁵

Like Solís, Reynolds presents a lengthy discussion of income distribution. On family income, he states,

The data in Table 2.10 show that, despite rapid economic development since 1950, the average monthly real income for the lower 20 percent of the population appears to have been lower in 1957 than in 1950, although the 1950 share is approached in the 1963 estimates. On the other hand, the real income of the top 30 percent of the population may have been higher in 1957 than in 1950 with the exception of those in the highest two brackets.²⁶

The data show that the bottom 50 percent of Mexican families received only 19.1 percent of the personal income in 1950, a share that dropped to 15.6 percent in 1957, and to 15.5 percent in 1963. Reynolds explains the combination of economic growth and increasing income inequality on the basis of Simon Kuznets's hypothesis that developing countries will experience long periods of income inequality as a result of a number of factors that include demographic trends, urbanization, capital formation, foreign trade, and taxation. He then admits that Kuznets demonstrated just the opposite for the United States, Great Britain, and Prussia in similar developing periods. Finally, the abundance of unskilled labor emerges as the exogenous variable that explains a deterioration in the distribution of income despite rising productivity.

The Mexican Economy contains a single table on real wages. Like Wilkie and Solís, Reynolds employs the legal urban minimum wage deflated by the Mexico City wholesale price index. However, unlike the others but consistent with his own approach, he is more critical of the data, commenting that,

Data on regional price relatives are available only for selected years. Most price indexes are based on Mexico City sources and do not necessarily reflect regional trends or disparities. Wage series are of doubtful quality and consist primarily of

²² Reynolds, *Mexican Economy*, p. 13.

²³ *Ibid.*, p. 5.

²⁴ Reynolds's bibliography lists books, articles, official publications, and unpublished materials such as theses and mimeographs, but makes no mention of any archival sources.

²⁵ Compare, for example, Reynolds, *Mexican Economy*, p. 60 and p. 195.

²⁶ *Ibid.*, p. 80.

legal minimum wage figures rather than actual wage levels, especially for earlier years.²⁷

Reynolds himself employs an index of the real minimum urban wage, setting 1950 = 100. The real wage stands at 139 in 1934-35, and at 138 in 1940-41. There follows a steep descent to 101 in 1944-45. Five years later wages drop one percent. The following years show a steady rise, so that the wage level reaches 153 in 1960-61, and 212 in 1964-65. The author mentions that the legal minimum probably represents an underestimation of the actual wage level, and concludes,

Real wages for unskilled labor in both rural and urban areas probably did not increase between the mid-1930s and 1945, and there is some evidence that they actually declined during the early 1940s. The fact that price increases outstripped increases in money wages and salaries supports the functional income distributional evidence that profit shares rose during the 1940's. Similarly, the suggestion of fairly constant shares of profit plus mixed income in the 1950's accords with the more favorable performance of real wages in this period.²⁸

Although Wilkie's data show more of a wage decline in the 1930s, the three authors with real wage statistics are in essential agreement. Wages fall in the 1940s and rise in the 1950s. Since they use the same sources, it is not surprising that their series match. Additionally, Solís's functional income distribution series strongly supports the real wage trends. Nonetheless, despite agreement on the evolution of the legal minimum wage, these pioneering studies ignored fundamental aspects of wages in Mexico, including actual wage levels, industry differences, occupational differences, fringe benefits, male-female wage ratios, as well as other important facets.

Despite limitations, these four books represent the outstanding examples of the increased interest in and use of quantitative data on modern Mexico. They exhibit the basic tendencies through the 1960s. Quantitative sources are almost always published government documents. There is little or no use of primary data. Wilkie rearranged the historical categories, changing the possibilities of constructing historical series. Since most researchers neither adopted this method nor delved into the archives, the long series remained restricted to the most general categories. As a result, series that begin prior to 1950 employ a breakdown by sector rather than by industry branch. The wage data are very thin, though the income distribution data are a bit more developed. Few of the authors are critical of the indicators, with the exception of Reynolds. Despite their drawbacks, these studies brought together new quantita-

tive information in a new way. In turn, this would stimulate more specific and more sophisticated socioeconomic analyses in the following decade.

Four Specific Studies

During the 1970s the field moved toward more specific uses of quantitative analyses. Because economists have been using mathematical languages longer than other social scientists, it is no surprise that they took the lead. Rather than employing time series for purely descriptive reasons, they began to use econometric models. Four landmark studies illustrate this trend.

Enrique Hernández Laos published *Evolución de la productividad de los factores en México* in 1973. The study rests on a mathematical (or operational) definition of factor productivity. The author measures factor productivity change by industry branch, in addition to identifying the origins and destinations of productivity profits. These measurements were pioneering in the 1970s, and were not superseded until Hernández Laos published *La productividad y el desarrollo industrial en México* twelve years later.²⁹

The author employed the Bank of Mexico's published National Accounts as his source. The Bank issued its 1950-67 series in 1969. Unlike Solís and Reynolds in 1970, Hernández Laos extensively analyzed the data rather than looking at the overall trends. He used a model of factor productivity for his analysis.

Since his productivity analysis depends so completely on the validity of the published statistics, the author must justify their use.

Statistical data proportioned by the Bank of Mexico has been used. There has not been a critical evaluation of this data, so that objections to the data itself must be directed to the source. If some of the data utilized seems doubtful, the only thing that can be said is that sooner or later relevant modifications will appear. Meanwhile the official data is the only data available.³⁰

The book's categories are derived from the model and/or from the National Accounts. Because the latter provide a detailed breakdown of the manufacturing sector, Hernández Laos can present data for the forty-six industries that comprise the sector. This permits a closer view of the Mexican economy than that observed in the previous books. His series cannot, however, go back beyond 1950, the first year of the National Accounts System. Hernández Laos's pioneering work thus contains three elements typical of future studies to be based upon the Bank of Mexico's data: rela-

²⁷ Ibid., p. 5.

²⁸ Ibid., p. 86.

²⁹ Enrique Hernández Laos, *Evolución de la productividad de los factores en México* (Mexico: Ediciones Productividad, 1973); *La productividad y el desarrollo industrial en México* (Mexico: Fondo de Cultura Económica, 1985).

³⁰ Ibid., p. 6.

tively short series beginning in 1950, a detailed industry breakdown of the manufacturing sector, and a somewhat uncritical use of the original statistical information, often despite sophisticated econometric methods.

Because productivity influences income distribution, *La evolución de la productividad de los factores* contains both primary and secondary data on the subject. The author's principal concern is to explain why family income distribution worsened in the same period that functional income distribution was getting better, through the 1950s and 1960s.

Despite the modest progress in the functional redistribution of income in favor of Labor, the population group of lowest incomes has seen its participation in personal income decline, while those with the highest incomes have bettered their position. The personal and functional distribution of incomes have thus evolved in opposite directions.³¹

With respect to family income, Hernández Laos used an article by Carlos Tello which showed that the 50 percent of families with the lowest incomes received 19 percent of total personal income in 1950, and only 16 percent in 1963.³² With respect to functional income distribution, Hernández Laos used the same National Accounts data as Solís, and thus came to the same conclusions. Labor's share of GDP rose from 25.2 percent in 1950 to 16.8 percent in 1955, to 31.1 percent in 1960, and to 33.3 percent in 1967.³³

Two elements worked against Labor in this period. First, the aggregate figures for factor productivity profits show a net deficit of 3,563,000,000 pesos (in constant 1960 pesos) for Labor from 1950 to 1967, which by definition represents a net gain for Capital of the same magnitude.³⁴ Second, the inflationary period from 1950 to 1958 altered the relative prices between Labor and Capital in favor of the latter.³⁵ Nonetheless, substantial employment growth permitted the distribution of income to tilt toward Labor in this period.

A real wage index can be constructed using the National Accounts. Hernández Laos's index shows a 61.9 percent rise in real wages from 1950 to 1967.³⁶ Wages are here defined as total remunerations to all wage earners. This mixes executives, white collar workers, and blue collar workers. It includes fringe benefits as well as monetary income. Such a definition differs from the legal minimum wage employed by the previous authors. Reynolds showed that the minimum doubled between 1950 and 1965, but it

is highly likely that the 40 percent difference between the two sets of data is due to their respective definitions of "wages." More importantly, different categories reveal the same pattern, a wage increase from the early 1950s to the mid 1960s.

Hernández Laos's study was one of the first major attempts to understand one of the central problems of the Mexican economy, productivity growth. Another major unstudied problem had been that of the relationship between industrialization and the external sector. René Villarreal tackled this in *El desequilibrio externo en la industrialización de México (1929-1975)*, published in 1976.³⁷

The book argues that industrialization has driven Mexico's economic growth since 1939, and that industrialization has depended on import substitution. Import substitution has effectively produced permanent balance of payments deficits. As a result, the country's growth is constantly threatened by a shortage of foreign exchange. Villarreal recommends a policy of export substitution as the solution.

A quantitative definition of import substitution lies at the very heart of the book. Villarreal uses his categories to measure the effects of this kind of industrialization. He divides the manufacturing sector into sixteen industrial branches, with measurements for 1929, 1939, and 1950 through 1969. The study thus revolves around a number of predefined economic concepts that are used to construct and interpret quantitative historical series.

The book's argument requires long series that also entail specific definitions of industry. To construct these series, the author combined the National Accounts with the 1929 and 1939 figures that were published by the Bureau of Statistics. Since the Bureau employed fewer branch categories in the earlier years, Villarreal added the figures from the narrower branches as defined by the National Accounts so that they would constitute the equivalent of the Bureau's data. This resulted in series longer than those used by Hernández Laos, and with more precision than those employed by Solís and Reynolds.

Villarreal makes no comment on this method of constructing historical series, even though it represents a plausible alternative to the Wilkie system. Both authors employed official published sources. Wilkie generated new series by combining the given categories into new ones. Villarreal also generated new series, but he did so by adding together the more detailed definitions of the recent sources so that they would be compatible with the wider categories of the earlier data. While the author does not explicitly say that this was his method of series construction, the data employed make it obvious. The tables list Bureau of Statistics publications as the 1929 and 1939 sources, and the National Accounts as well as the Input-Output Tables as

³¹ *Ibid.*, p. 96.

³² Carlos Tello, "Notas para el análisis de la distribución personal del ingreso en México," *El Trimestre Económico* 38:150 (1971), 632.

³³ Hernández Laos, *Evolución*, p. 83.

³⁴ *Ibid.*, p. 85.

³⁵ *Ibid.*, p. 96.

³⁶ *Ibid.*, p. 76.

³⁷ René Villarreal, *El desequilibrio externo en la industrialización de México (1929-1975)* (Mexico: Fondo de Cultura Económica, 1976).

the post-1950 sources. The latter publications employ more than forty industrial branch categories.³⁸ The sixteen that Villarreal uses correspond exactly to the more inclusive definitions that the Bureau employed in the early period. Since one cannot combine the two sets by dividing the inclusive categories, the only possibility is to add the finer ones.

Econometric studies were not the only advances in the field in the 1970s. Toward the end of the decade Menno Vellinga published *Industrialización, burguesía y clase obrera en México*.³⁹ Vellinga is a sociologist, and he uses multivariate statistical analysis instead of the econometric frameworks employed by the previous authors. He does not make use of historical series.

The study is based on a survey of 440 workers in four Monterrey industrial plants. Its object is to find correlations between social and economic characteristics and the workers' class consciousness. At the time it was done, the book represented one of the most advanced examples of applied multivariate statistical analysis in Mexico. Its methodology has the advantage of not being limited to the historically given categories; the survey designer simply invents his own. One finds no sense of movement in the book, however, nor any attempt to construct time series since that would take the author beyond the sources he employed.

Vellinga's study shares important characteristics with those carried out by Hernández Laos and Villarreal. The focus is specific, the questions are direct, and there are more models and more assumptions than in the general studies reviewed earlier. The mathematics has moved from a descriptive to an analytical role. With an accumulation of knowledge on modern Mexican history has come a certain sophistication in technique. These trends are best expressed in the 1983 study by Jesús Reyes Heróles González Garza, *Política macroeconómica y bienestar en México*.⁴⁰

Methodologically Reyes Heróles breaks new ground within a natural evolution of income distribution studies in Mexico. The book contains not only an exhaustive review of the literature, but also an extensive discussion of the primary sources. This sophisticated discussion leads the author to use econometric methods to estimate new parameters for his linear programming model. In other words, he can go beyond the published data, albeit within the restrictions of his model.

The heart of the book is a multisectoral, general equilibrium model of the Mexican economy in 1970, one that incorporates fifty endogenous variables and seventy-six exogenous variables and parameters. Such a model stretches the availability of quantitative information in a country like Mexico that has only recently been developing key statistical

indicators. Reyes Heróles has dealt with the problem by using the available data to estimate the missing pieces according to calculations based on specific literature in areas such as tax studies, consumer behavior, and so on.

While the construction of the model represents an enormous feat, the book's most important contributions lie in three areas partially outside of the model: the analysis of urban, industrial labor markets; the analysis of rural, agricultural labor markets; and his quantitative suggestions of the impact of certain macroeconomic effects upon the dual labor markets in each of the sectors.

Reyes Heróles draws upon traditional economic literature as well as generally published quantitative sources on the urban industrial sector in Mexico in order to describe its basic structure as a dual labor market. One segment is characterized by labor unions, respect for labor laws, and high and rigid wage structure. The other segment is characterized by a lack of unions, lack of respect for labor laws, and low and flexible wages. The former is the modern sector, according to the author, the latter the traditional sector, a duality that he later applies to commerce, and finally to agricultural labor markets. According to his income and wage distribution figures, industrial workers in the modern sector bettered their relative position in Mexican society from 1953 to 1976. He then uses occupational wage data to show a rigid wage structure at the upper end of the wage scale.

As opposed to industry, however, agricultural income differences are more a function of property than wages. Reyes Heróles argues that the persistence of economically unviable smallholdings insures the continuance of a large group of poor families. They effectively do not allow Mexico to either reduce rural poverty or improve national income distribution. The data indicate that the gap between the poorest sectors of Mexican society (mostly rural poor, but also workers from the traditional segments of other economic sectors) and the average sectors has been increasing since at least the 1960s.

Reyes Heróles uses the segmentation of labor markets to show that the distributive effect of macroeconomic policies is not uniform but varies in impact according to the population category. It is not enough to look at overall growth rates or even overall Gini coefficients (a distributional measure that ranges from 0 for complete equality to 1 for complete inequality), but rather toward the specific behavior of income in each sector of the economy.

This study combines the sophistication of econometric techniques typical of the economists, with an awareness of sources more common to the historians. As a result, he can use his quantitative methods to estimate missing parameters, an uncommon feat in the earlier literature.

Income Distribution in Mexico

Having reviewed the evolution of quantitative studies in Mexico over the last thirty years, we can now turn to quanti-

³⁸ Ibid., appendix D.

³⁹ Menno Vellinga, *Industrialización, burguesía y clase obrera en México* (Mexico: Siglo XXI, 1979).

⁴⁰ Jesús Reyes Heróles González Garza, *Política macroeconómica y bienestar en México* (Mexico: Fondo de Cultura Económica, 1983).

tative studies on incomes, prices, and wages. To begin with, there exist more income than wage studies. For example, *Información sobre información* lists twenty-nine titles concerned with family and functional income distribution, but not a single real wage study.⁴¹ Second, the greater numbers of income studies will help establish some of the basic trends in the use of sources in related areas like wages. Finally, the evolution of income distribution serves as a check on the reliability of the wage series.

We have already had an introduction to the problems of Mexican income distribution. The authors discussed considered it one of the country's major problems. They based their analyses on official published sources, especially those generated by the Bank of Mexico. The functional distribution studies use the Bank's National Accounts; the family distribution studies use the Bank's income-spending surveys. These sources indicate that Capital has always received a greater share of the GDP than Labor, and that the cyclical movement in the relationship between the two shows no long-term trend in favor of Labor. The sources also indicate that time has increased the differences between the richest and the poorest families. These elements can be seen with greater clarity if we look at some of the pioneering, important income distribution studies that have appeared in the last decades.

Ifigenia Martínez de Navarrete first published on the subject in 1960, and her later articles essentially elaborated on the earlier effort.⁴² She employed the 1950 population census, two family income-spending surveys carried out in the 1950s by the then General Bureau of Surveys (Dirección General de Muestreo) of the Ministry of Industry and Commerce, and the Bank of Mexico's 1963 income-spending survey. The two 1950 surveys pioneered later efforts that were to be systematized by the Bank of Mexico, although antecedents existed in the 1920s and 1930s. The Bank carried out two in the 1960s (in 1963 and 1968), the recently expired Center for Labor Statistics (Centro Nacional de Información y Estadística de Trabajo) did another in 1975, while SPP carried out still another in 1977, so that it is difficult to tell who will remain with the final responsibility for the survey.

Navarrete herself noted that the data from the different sources were not always comparable, so that she had to make a number of adjustments. She also stated that the families with lowest incomes tend to report more spending in each period than income. This required estimations to account for non-reported as well as non-monetary incomes.⁴³

The study indicated that family income distribution was bad and getting worse. Her data, later to be repeated by González Casanova and others, demonstrated that the 50

percent of families with the lowest incomes received just 19.1 percent of total family income in 1950, 16.7 percent in 1958, and 15.7 percent in 1963. The Gini coefficient of family income distribution rose from .50 in 1950 to .53 in 1958, and to .55 in 1963. Compared with seven other Latin American countries in 1960, Mexico registered the highest Gini coefficient, indicating the greatest inequality of distribution. The Ginis for the others ranged from .53 for El Salvador and Venezuela to .46 for Argentina.⁴⁴

After Martínez de Navarrete looked at national income distribution, Jesús Puente Leyva studied the regional aspect. In 1967 he published the results in *Distribución del ingreso en un área urbana: el caso de Monterrey*.⁴⁵ Unlike the other studies, this one does not use official published documents but a specially designed survey. It is interesting to note that both of the survey-based studies considered here, Vellinga's and Puente Leyva's, are regional works on the Monterrey metropolitan area. The survey was carried out by the Universidad Autónoma de Nuevo León among 866 families. The author mentions that,

A special effort was expressed in capturing family income in the most complete fashion possible . . . specifically in non-monetary income and in certain forms of salary retribution that frequently are omitted, such as overtime and benefits.⁴⁶

The survey indicated that the distribution of family income is slightly less unequal in Monterrey, a highly industrialized city, than in the rest of the country, although more unequal than in the United States or Western Europe. The data yielded a Gini coefficient for the city of .49 for 1965. Puente Leyva developed a final coefficient of .41. This latter statistic takes into account some redistributive services such as education.

Although Puente Leyva's final Gini coefficient is lower than the original, it is still very high compared to that of other countries. According to the author, the strong difference in wages between skilled and unskilled labor negatively influences the distribution statistic. Unskilled labor pours into the market at a rate faster than its possible absorption, so that capital tends to become more rather than less scarce. In effect, the growth in urban immigrants more than offsets the positive effects of high profits and moderately rising wages, so that there exists no apparent tendency toward more equally distributed incomes. Despite periods of declining wages, such as in the 1940s, many authors have argued that positive changes in the occupational structure have more than overcome the effects of declining real wages. Puente Leyva's book indicates that the effects of occupational mobility are more complex. While the establishment of new and higher-paying industries may tend to raise incomes, if this expansion is less than the rate of migra-

⁴¹ *Información* 1 (3), 50-52.

⁴² Ifigenia Martínez de Navarrete, "La distribución de ingreso y el desarrollo económico de México: tendencias y proyección a 1980," in *La economía mexicana*, Leopoldo Solís, editor (Mexico: Fondo de Cultura Económica, 1975).

⁴³ Martínez de Navarrete, "Distribución de ingreso," p. 300.

⁴⁴ *Ibid.*, p. 296.

⁴⁵ Jesús Puente Leyva, *Distribución del ingreso en un área urbana: el caso de Monterrey* (Mexico: Siglo XXI, 1976).

⁴⁶ *Ibid.*, p. 96.

tion to the cities, the distribution of incomes may continue to worsen.

The studies by Martínez de Navarrete and Puente Leyva served to alert the academic community that, despite the country's impressive economic growth after 1940, a serious social problem was brewing. Possibly reacting to this warning, in 1974 the Bank of Mexico published, for the first time, its 1968 family income-spending survey.⁴⁷ In addition to the quantitative results, the document contains a fine description of the methodology employed. The Bank carried out a random, stratified survey among 5,939 families, with a confidence level of 97 percent. The results were checked against the National Accounts. The difference between total family income measured by the National Accounts, and that estimated by the survey was only 3 percent, "probably due to a statistical difference between the two sources."⁴⁸

The survey produced some very interesting results. It demonstrated that 85 percent of Mexican families receive half the total family income, the other half going to only 15 percent of the families. The total family income for 1968 was estimated at 16,058,000,000 pesos. Wages and salaries constituted 58.8 percent of the total, self-employed income 25.4 percent, returns on capital and investments 11.5 percent, and transfers 4.3 percent. The survey also indicated that the 38 percent of families that were rural received 22 percent of the income, while the 62 percent that were non-rural took 78 percent of the income.

In 1968 the country's estimated population stood at 47,529,000, with 30 percent comprising the economically active population. Of these, manufacturing, construction, and generation of electrical energy made up 18.53 percent: 13.51 percent in manufacturing, 4.82 percent in construction, and .197 percent in electrical power. For the entire economically active population, the mean monthly income was 1,269.59 pesos; 1,324.56 for men, 1,016.56 for women. The mean income for the manufacturing sector stood considerably above the overall mean: 1,934.37 for men, 1,070.90 for women, and 1,801.59 overall, indicating that many more men than women were employed in the sector. The mean income for workers in electrical power was just about double that for workers in construction, supporting Puente Leyva's comment on the differences between skilled and unskilled wages. Electrical energy workers averaged 2,160.32 pesos, while construction workers averaged only 1,196.23. In other words, the mean monthly income in manufacturing is considerably above the overall mean, which in turn is above the average income in construction. Additionally, construction workers, generally male, earn more

than female workers in the otherwise high-paid manufacturing sector.

In other words, the survey indicated that in 1968 less than a third of the Mexican population was employed. Of these, less than a fifth worked in the manufacturing sector. In this sector, wages stood 42 percent above the overall average, so that one might consider workers in this group as relatively "privileged." The survey also showed that men constituted 82.54 percent of the economically active population, while earning considerably more than women.⁴⁹

The publication of the survey in 1974 represented an advance in policy rather than methodology. The next step forward came in 1980 with Manuel Gollas's "Orígenes de la desigualdad en la distribución del ingreso familiar en México."⁵⁰ The author employed the Bank's 1968 survey, as well as the 1963 and 1975 versions. A first of its kind in Mexico, the study attempted to unify functional and personal income distribution through the construction of a complex Gini coefficient that included Pseudo Ginis. The author also attempted to provide dynamic analysis by using partial derivatives.

The article showed that from 1963 to 1975 the aggregate Gini slightly increased from .5439 to .5696, indicating slightly increasing inequality of income distribution. According to the author, in the same period the share of total income going to Labor increased from .6267 to .6358. Finally, the mathematical techniques employed lead the author to state that Labor income is more responsible for the overall inequality than Capital income, despite the fact that the latter is more unequally distributed.

It is not difficult to demonstrate that Gollas, to whom one must give credit for employing a new methodology, remains quite uncritical of both his mathematical technique as well as his sources.⁵¹ His equations are necessary tautologies, but to equate his partial derivatives with real-world causality stretches the imagination. There is no interest in the definitions employed by the original sources, so that the categories "Labor" and "Capital" may indeed reflect something else. This is a difficult problem because Gollas indicates that Labor received 53 percent of total income in 1968 (based on the Bank's survey), whereas Hernández Laos (based on the National Accounts) demonstrated that Labor received only 33.3 percent in 1967. Despite these difficulties, the article's basic conclusion, that income distribution worsened from 1963 to 1975, is probably correct.

⁴⁷ Banco de México, *La distribución del ingreso en México, encuesta sobre los ingresos y gastos de las familias 1968* (Mexico: Fondo de Cultura Económica, 1974).

⁴⁸ Banco de México, *Distribución del ingreso*, p. 15.

⁴⁹ The Bank's survey is the source of the data, although some of the calculations are mine.

⁵⁰ Manuel Gollas, "Orígenes de la desigualdad en la distribución del ingreso familiar en México," *Panorama y perspectivas de la economía mexicana*, Nora Lustig, editor (Mexico: El Colegio de México, 1980), pp. 137-154.

⁵¹ Jeffrey Bortz, "Comentarios," in Lustig, ed., *Panorama*, pp. 155-159.

In 1980 Wouter van Ginneken published his *Socioeconomic Groups and Income Distribution in Mexico*.⁵² This is a very thorough and sophisticated study that employs a linear programming model to analyze the distribution of income between socioeconomic groups.

Unlike previous authors studying income distribution, van Ginneken reveals a careful and critical attitude toward his sources and methods. The data base consists of the country's input-output tables, the National Accounts, the population censuses, the sectoral censuses, and the various family income-spending surveys. Van Ginneken takes no source for granted, analyzing their different methodologies and definitions. He cross-checks the data. He generates new data by comparing information based on distinct methods, and then spelling out what the correct figures ought to be. Quite different from the previous studies, he clearly states the limitations of his model. "There are also some disadvantages to linear programming models. The most important is that all relations are linear while the reality of the economic process shows non-linear relationships."⁵³ Van Ginneken was one of the first scholars, before the Reyes Heróles study, to combine the historian's sense of sources with the economist's use of sophisticated quantitative methods.

As observed in the case of Hernández Laos, van Ginneken utilizes a source that provides for a large number of industries, each with a detailed definition. Like Wilkie, he rearranges the data in order to form new sectors, for example dividing manufacturing into flexible and inflexible with respect to the possibilities of technological change. Van Ginneken never confronts the necessity of reconstructing historical series since his book is not concerned with long historical analysis.

The study confirms that Mexico has had one of the highest levels of income inequality in Latin America, which in turn distributes income more unequally than the United States or Western Europe. It also shows that this inequality increased from 1950 to 1970, then stabilizing at a relatively high level. The country's overall Gini stood at .50 in 1950, rising to .58 in 1975. In 1950 the poorest 20 percent of families received 6.1 percent of the income; their share dropped to 4.1 percent twenty-five years later.

The author uses the Theil decomposition analysis to demonstrate that six characteristics—education, age, occupation, sector, region, and size of location—serve to explain 80 percent to 90 percent of the income inequalities between families. His model then tries to show that the socioeconomic group is the most powerful explanatory variable. Van Ginneken recognizes the need to make nonquantifiable assumptions about the interests and the political organization of his defined groups. For example, he assumes that the "labor sector" of Mexico's ruling party, the PRI, does actually

represent workers' interests, although many sociologists and labor historians have claimed just the opposite. While these kinds of debatable assumptions tend to weaken the model's conclusions, there can be little doubt that the preciseness of the study opens that way to future quantitative research that goes beyond the economic data used by van Ginneken himself.

There are two important differences between the van Ginneken study and the ones discussed earlier. While the economists, like Gollas or Puente Leyva, tend to see income inequality as a purely economic phenomenon, *Socioeconomic Groups and Income Distribution in Mexico* successfully demonstrates that the political and social structures also play a determining role. Second, the 1960s and 1970s tendency to just accept the given data is reversed here. By contrast, van Ginneken proves that the economist can and must be as critical as the historian with respect to the sources. In doing so, he implicitly challenges the historian to become as sophisticated as the economist with respect to the methods of measurement.

Subsequent to this study, a number of authors have contributed to advancing our knowledge of Mexican income distribution. Nora Lustig, Enrique Hernández Laos, Jorge Córdoba, Eugenio Rovzar, and Julio López each have made important contributions in this area. These studies have continued to use the traditional sources seen above, and have generally divided their focus. Some, notably the Lustig book, have used income distribution models to analyze the Mexican economy. Others, like that by Hernández Laos and Córdoba, continue to measure one of the country's more serious problems.⁵⁴

Price Index Analysis

Income distribution can be understood in terms of current money values, but real wages by their very definition must always employ constant values. Using "constant" money implies measuring the "value" of currency through time. Price indices are the standard form of measurement of this phenomenon, and are thus used to deflate nominal wages (wages in current money terms) in order to determine real wages. This section discusses some of the price literature in Mexico. Since price indices also measure inflation, their discussion might lead the reader to believe that we shall enter into a discussion of price movement in Mexico. Unfortunately, Mexican inflation is too complex a phenomenon to be dealt with here, except as it directly relates to wage move-

⁵² Wouter van Ginneken, *Socioeconomic Groups and Income Distribution in Mexico* (New York: St. Martin's Press, 1980).

⁵³ *Ibid.*, p. 81.

⁵⁴ See Rolando Cordera and Carlos Tello, editors, *La desigualdad en México* (Mexico: Siglo XXI, 1984). Also important are Nora Lustig, *Distribución del ingreso y crecimiento en México* (Mexico: El Colegio de México, 1981); Enrique Hernández Laos and Jorge Córdoba, *La distribución del ingreso en México* (Mexico: CIIS, 1982); Eugenio Rovzar, "Análisis de las tendencias en la distribución del ingreso en México (1958-1977)," in *Economía Mexicana*, no. 3, 1981, pp. 109-138.

ment. The discussion will be limited to the indices themselves.⁵⁵

Although there exists a well-developed body of literature on inflation in Mexico, there are no complete, critical studies of the country's price indicators. The few analyses that do exist, as the three examples that follow show, tend to emerge from the government sector rather than from the universities. This has resulted in practical and operationally oriented materials that tend to be light on theory and theoretical criticisms.

In 1942 Pedro Merla, an advisor to the Mexican Labor Ministry, published "El costo de la vida obrera en México."⁵⁶ The article argued for wage and salary increases as well as for certain structural economic reforms. The idea of a wage increase came naturally from his "workers' cost of living analysis," which in turn was part of a two-fold argument. The first part estimated the daily consumption of a typical family of five, showing that the cost of these goods plus rent and other monthly expenses exceeded the legal minimum wage. This kind of argument is typical in the Mexican literature through the 1920s and 1930s. The second part demonstrated that the rise in the cost of living, as measured by the official Workers Cost of Living Index, considerably outpaced the increases in the minimum wage. From 1934 to 1941 wages rose 29 percent and the index 74 percent.⁵⁷

Merla's study reflects three tendencies in the literature of his time. First, almost all of the data indicated a severe decline in real wages from 1934 to 1942. Second, through the 1930s and 1940s the use and analysis of price indices in Mexico were intimately related to the wage problem. Last, taking note that Merla was an advisor to the Labor Ministry, the government generally carried out these studies.

The following year two employees of the Ministry of the National Economy, Federico Bach and Margarita Reyna, published "El nuevo índice de precios al mayoreo en la ciudad de México de la Secretaría de la Economía Nacional."⁵⁸ The article states that the Bureau of Statistics' original wholesale price index dated from 1929, the same year as the Bank of Mexico's original index. Both indices employed fixed weights which had become inadequate by the late 1930s. The Ministry had put the authors in charge of designing a new index that would incorporate changing consumption patterns. While switching index formulas, they also decided to modify and enlarge the basket. Their article not only describes the new index, but also criticizes the existing ones. In addition, it tells of future plans to

"reconstruct" the wholesale index backward to 1918, and eventually to 1890.

Bach and Reyna wrote one of the few articles in the Mexican literature that engages in a technical discussion of the country's price indicators. The first issue of *Información sobre información*, dedicated exclusively to the topic of price indices, gives an idea of just how few technical discussions there have been. The bibliography lists 103 articles, of which 100 deal with Mexican inflation, and only 3 with price index construction.⁵⁹ One of the three is the Bach and Reyna article. We might also note that this study was also produced within the government, as was the case with the Merla article.

Through the 1950s and 1960s little was published on Mexican price indicators. It is to be assumed that the Bank of Mexico engaged in thorough internal debates on these indices during that period since it began to generate new ones in 1968, but these debates generally did not reach the public. The General Coordination of the National Information System tried to fill the gap in 1977 by dedicating, as I have mentioned, the entire first issue of *Información sobre información* to the problem. This issue constitutes the most complete comparative discussion of Mexican price indicators to its date of publication.

This issue of *Información sobre información* lists virtually all the price indices currently generated by the government. The list includes construction (basket and formula), length of the series, as well as other technical data. Importantly, it does not contain the actual values of the indices, which are to be found in other, dispersed documents. A complete record of the country's indices did not exist until 1977, and then the government produced it with the usual technical emphasis.

Two books were published in the 1980s that completed the picture of Mexican price index development in the twentieth century. In 1982 the Bank of Mexico published *Precios, Cuaderno 1927-1979*.⁶⁰ This document contains the values for a number of the Bank's indices for the period mentioned, though it has almost no discussion of method. In 1985 the Instituto Nacional de Estadística Geografía, e Informática (INEGI) published the two-volume *Estadísticas Históricas de México*, with a more complete listing of the country's indices, though again, with relatively little discussion of methods.⁶¹

After the Bank published its historical indices, it continued to publish *Precios* on a monthly basis. Similarly, the INEGI has continued to publish price index values in its monthly economic series.

⁵⁵ A more complete discussion of inflation can be found in Jeffrey Bortz and Rafael Sánchez, "Salarios y crisis económica en México," in Jeff Bortz et al., *La estructura de salarios en México* (Mexico: UAM, 1985), pp. 37-110.

⁵⁶ Pedro Merla, "El costo de la vida obrera en México," pamphlet of the Secretaría del Trabajo y Previsión Social, Mexico, 1942.

⁵⁷ *Ibid.*, p. 11.

⁵⁸ Bach and Reyna, "El nuevo índice."

⁵⁹ *Información* 1:1 (1977), 37-41.

⁶⁰ Banco de México, S.A., *Precios, Cuaderno 1927-1979* (Mexico, 1982).

⁶¹ Instituto Nacional de Estadística, Geografía e Informática, *Estadísticas Históricas de México* (Mexico, 1985).

Real Wage Studies

This essay has followed the evolution of quantitative studies in Mexico, from the more general to the more specific, coming closer to real wage studies. This section will review the evolution of real wages in Mexico. We have already observed one of them, the deflated legal minimum wage. After reviewing more legal minimum wage data, we shall turn to the first extensive real wage analysis, that carried out in 1951 by Juan Noyola Vázquez and Diego G. López Rosado. Since not many academics followed in the steps of these two pioneers, the next breakthrough came in 1967 with Everett's "The Role of the Mexican Trade Unions, 1950-1963." Last, we shall review some new directions in wage studies in Mexico.

In the introduction we observed that real wage series consist of nominal wage series deflated by a price index. Nonetheless, real wage series can vary considerably in complexity according to: (1) the universe (sectoral or industrial breakdowns, occupational and geographical distributions, etc.); (2) the quality of the price index; (3) the quality of the wage source; (4) the length of the series; (5) the relationship of the wage series to other data. Reynolds based his criticisms of real wage series on the first and third elements. Since most studies just employed the legal minimum, they could neither deal with actual wage levels nor with any kind of industrial breakdown. But the legal minimum is easy to use, explaining its predominance in the field.

The original minimum wage system in Mexico empowered the more than 2,300 *municipios* in Mexico to each establish their own minimum wage for both rural and urban workers.⁶² In 1964 the government established the National Minimum Wage Commission (Comisión Nacional de los Salarios Mínimos, or CNSM). As a tripartite entity, it had the authority to set the minimum wages for the 111 economic zones into which the country was divided. Since then, the Commission has considerably reduced the number of wage districts, and today there are only seven. Although the CNSM maintains its own technical staff to carry out regional price indices especially designed for minimum wage purposes, the setting of minimum wages is as much a political as a technical process. The Commission publishes its minimum wage figures every time new levels are set; it does not publish the minimum wages in long time series form nor deflate them so that they might constitute real wage series, but neither of these are difficult tasks if one has the original information.⁶³

In this discussion we have seen that virtually all the authors who constructed wage series did so on the basis of the legal minimum. The data are available, fit easily in historical

series, and can be deflated by any reasonable price index. There are, however, two problems. The first is that the minimum wage is not national but regional, so that to construct a nationwide series implies either using a simple but biased mean, or some sort of weighted mean. Since most authors have not wanted to tackle this, they have generally substituted the minimum wage series for Mexico City. The second is that the legal minimum is not an actual wage figure for most workers. While the concept is clear and easy to use, it is not always obvious just what universe of workers it covers. Carlos Pereyra quoted a study carried out by the National Minimum Wage Commission which indicated that of the 6.3 million workers in nonagricultural activities, 38 percent earned wages above the minimum, 27 percent equal to the minimum, and 35 percent below that figure.⁶⁴ Those who actually earn the legal minimum can be found in all sectors and industries, so that one might refer to minimum wage workers as its own universe.

Despite these difficulties, academe as well as government have gone little beyond the legal minimum wage, deflated by some official price index, as the basis of their real wage analyses.⁶⁵ Since many Mexican workers do earn this wage, and since changes in the minimum can affect other wage levels, such series are not invalid. Perhaps their main defect is representing an undifferentiated indicator that does not permit an analysis of wage evolution by sector, industry, or occupational group.

Merla's article is proof that the tradition of employing real wage series based on the legal minimum has its origins in the minimum wage system itself. In 1951 Juan F. Noyola Vázquez and Diego G. López Rosado published the first significant methodological advance on these relatively simple series. Their article, "Los salarios reales en México," presented a methodological discussion quite unusual in the early literature.⁶⁶ The authors examined the limitations of the legal minimum as the sole source of wage series, and treated problems of data representativity. They decided to go beyond the legal minimum, and additionally employed a relatively new government industrial wage survey, the Bureau of Statistics' *Trabajo y Salarios Industriales*. Although the Bureau had been carrying out the survey since 1939, Noyola Vázquez and López Rosado were the first to employ it critically as a nominal wage source.

The article indicated that the mean industrial wage stood considerably above the legal minimum, something that the Bank of Mexico's published family income survey also demonstrated. The industrial wage also grew at a faster rate; in 1939 the industrial average was 2.5 times the legal minimum,

⁶² James Bass, "Mexican Economic Growth since 1950: Wage and Employment Effects," mimeograph, Economics Department, Queens College of the City University of New York, no date.

⁶³ Comisión Nacional de los Salarios Mínimos, *Memoria de los trabajos 1972-1973* (Mexico, 1975); and *Memoria de los trabajos 1974-1975* (Mexico, 1978); and also *Salarios mínimos 1979* (Mexico, 1979).

⁶⁴ Carlos Pereyra, "México: los límites del reformismo," *Cuadernos Políticos* (Mexico), July-September 1974.

⁶⁵ For two examples, see Banco de México, *Informe 1978*, pp. 63-64, and Secretaría del Trabajo y Previsión Social, *Principales indicadores del trabajo 1974* (Mexico, no date), pp. 11-16.

⁶⁶ Juan F. Noyola Vázquez and Diego G. López Rosado, "Los salarios reales en México, 1939-1950," in Leopoldo Solís, ed., *Economía mexicana*, pp. 343-350.

and by 1947 it stood at 3.3 times the minimum. The industry branch figures revealed that nominal daily wages in Pemex, the government's oil monopoly, rose from 11.81 pesos in 1939 to 33.50 ten years later; in Ferrocarriles Nacionales de México, another government-owned enterprise, from 5.64 to 16.50; in the federal government bureaucracy from 4.20 to 9.13; and in the overall private sector, based on a mean of 24 industries, from 3.46 to 9.04. Here we can see that, on the one hand, the government enterprises paid higher wages than private firms, and their increases were greater at this time. On the other hand, wages in the bureaucracy were quite comparable to those in private industry, but grew slightly less.

Since these wages represent nominal figures, the authors deflated them with the Workers Cost of Living Index. This produced real wage series from which the two economists concluded:

From the comparison among diverse wage series and the cost of living index, the result is that the purchasing power of the agricultural minimum wage dropped 39 percent, the average wage of 35 industries 27 percent (until 1947, although it probably bettered in the following two years); and that of public federal employees dropped 35 percent.⁶⁷

This represented an important statement at the time. The 1940s constituted a period of sharp economic growth for Mexico, part of which would later be defined as the Mexican Miracle. The government actively pursued economic policies that favored private investment by both national and foreign capital. From 1940 to 1950 the country's gross domestic product almost doubled, jumping from 22,889 million pesos to 41,060 million (constant 1950 pesos). Manufacturing GDP grew at a slightly faster rate, from 4,264 million to 8,437 million.⁶⁸ According to Reynolds, the compound annual rate of growth for the economy as a whole during this period was 6.7 percent, while for manufacturing it was 8.1 percent.⁶⁹ He also demonstrated that per capita GDP rose 50 percent in the same ten years, from 1,075 pesos (constant 1950 pesos) to 1,553.⁷⁰ The Mexican government was justly proud of a rapidly expanding economy whose growth was spearheaded by manufacturing, and which resulted in rising per capita income. Noyola Vázquez and López Rosado unequivocally demonstrated that the economic and manufacturing growth were accompanied by a sharp decline in real wages in almost all sectors, so that per capita income growth was hiding increasing inequality of income distribution.⁷¹

⁶⁷ Ibid., p. 347.

⁶⁸ Solís, *Realidad económica*, pp. 91-92.

⁶⁹ Reynolds, *Mexican Economy*, p. 22.

⁷⁰ Ibid., p. 16.

⁷¹ I have argued elsewhere that, in fact, declining real wages to industrial workers as well as falling incomes to campesinos financed the country's economic growth during this period. See Jeffrey Bortz, *El salario en México* (Mexico: El Caballito, 1986), ch. 6.

Interestingly, when the two authors had to confront the apparent contradiction between the growing economy and the falling standard of living, they chose to deny their own quantitative conclusions:

As a consequence of occupational shifts from lower-paying to higher-paying jobs as well as job mobility to higher-paying categories, the real mean wage (weighted) of the *entire* working population has grown although in almost every specific work category it has diminished.⁷²

They did not, however, present any quantitative evidence to support this assertion.

Noyola Vázquez and López Rosado were not alone in their attempt to make the statistical information conform to what they wanted the reality to be. The Bureau of Statistics played the same game. In that period, and until the present, the DGE's *Anuario Estadístico* published the results of the wage survey, the same survey that the two economists had used to demonstrate declining real wages. Beginning with the 1951-52 edition, the *Anuario* included a section on per capita income. They justified the new section by stating:

An innovation that should be pointed out is the change effected in chapter 14. It is no longer Wages and Average Time Worked but National Income and the Standard of Living. The change comes from the convenience of demonstrating, in a closer relationship, preferential objectives in which governmental action has been oriented in order to elevate the standard of living of the population, affording the population a higher purchasing power.⁷³

This new section contained per capita income, which was indeed rising in this period. The *Anuario* did not explain that rising per capita income can be accompanied by a falling standard of living for most people, depending on the trends in income distribution. The data demonstrated a sharply worsening personal and functional income distribution for the period. This, and real wage movement, strongly indicated that the general standard of living was declining in Mexico in the 1940s. Nonetheless, neither academic economists nor government officials were willing to accept this fact.

The next significant advance in Mexican real wage studies came in 1967 with Mike Everett's "The Evolution of the Mexican Wage Structure, 1939-1963"; afterward he incorporated this mimeograph into his doctoral dissertation, "The Role of the Mexican Trade Unions, 1950-1963."⁷⁴ Everett intensively explored the wage data contained in *Trabajo y Salarios Industriales*. Noyola Vázquez and López

⁷² Noyola Vázquez and López Rosado, "Salarios reales," p. 348.

⁷³ *Anuario 1951-1952*, p. 5.

⁷⁴ Mike Everett, "The Evolution of the Mexican Wage Structure, 1939-1963," mimeograph, El Colegio de México, 1967; and "The Role of the Mexican Trade Unions, 1950-1963," Ph.D. dissertation, Washington University, 1967.

Rosado had taken advantage of the survey's published mean wages for each of the industries covered. But the survey not only published the mean wage by industry, but also by industrial district and occupation. Everett used the overall industry means to extend the series from 1939 to 1963, a longer period than that covered in the previous article. In addition, he analyzed the industrial district means and also included a study of occupational wages. Everett was thus the first to take full advantage of Mexico's most complete industrial wage survey.

Everett constructed nominal wage series for the Mexican industrial sector as a whole, and for 33 branches of industry. He had little difficulty constructing the industry tables since the Bureau of Statistics had not seriously modified the definitions of industry branch from 1939 to 1963. He also used the data to describe industrial, geographical, and occupational wage differentials for the same period. With respect to the validity of the survey data itself, he noted that the occupational figures are the weakest because of a lack of uniformity in classification, but that the overall statistics "are probably reasonably reliable and make sense when studied in relation to economic and political changes from 1939 to 1963."⁷⁵

Everett's use of methodology is quite sophisticated, fully on a par with later studies. But there appears to be some weakness in his analysis of the sources. For example, he states that modern industries, such as automobiles, were not covered by the survey; it seems, in fact, that the survey did include these industries. Modern automobile plants, however, had been included under the innocuous label "mechanics shops" (*talleres mecánicos*). Despite this, Everett's treatment of *Trabajo y salarios industriales* remains one of the most careful, complete, and sophisticated studies that exist in the literature.

Another advance in the Everett study with respect to the Noyola Vázquez and López Rosado study is the critical use of deflators. Instead of passively accepting the existing price indices, Everett analyzes their possible biases in order to generate a better index. He notes, correctly, that there existed two possible retail price indices for the Federal District: the Retail Price Index and the Workers Cost of Living Index (WCLI). In his opinion, the WCLI underestimated the cost of living because it did not include nor properly weight modern consumer goods. He also states that its use of prices from public markets which undersold other markets would further contribute to underestimating the rise in the cost of living. The Retail Price Index (RPI), in contrast, supposedly overestimated inflation since it was limited and without any explicit weighting, thus giving too much influence to a small number of high-priced goods.

Given these biases, Everett constructed a deflator for the Federal District by taking the simple average of the two official indices. His index therefore moves between the

WCLI and the RPI. He then constructed a national deflator, which is a composite index based on his Federal District deflator and the official indices from four other cities.

In addition to the nominal wage tables and the deflators, "The Evolution of the Mexican Wage Structure, 1939-1963" contains an analysis of fringe benefits that uses census materials. The data are not very good, according to the author, but roughly indicate that fringe benefits increased somewhat from 1950 to 1960. Industrial averages showed that benefits as a proportion of wages and salaries were 9.1 percent in 1950, 5.6 percent in 1955, and 12 percent in 1960.⁷⁶

Everett combined his nominal wage series with his new deflators to produce real wage series that contain the following items: (1) average real weekly earnings in 33 industries for six industrial districts, annually from 1939 to 1963; (2) overall industrial averages; (3) the standard deviation of inter-industrial earnings structure; (4) real earnings for skilled and unskilled occupations for selected industries in the Federal District, every five years from 1940 to 1960. He also supplemented these data with other wage information generated by the Labor Ministry for seven other major industries. His final real wage tables cover 40 industries.

The study defines average real earnings in the Mexican industrial sector as the simple mean of the average wage in each of the 33 industries in the six districts.⁷⁷ Real weekly earnings were 26.92 pesos in 1939, 18.53 in 1944, and only 16.48 in 1952 (all of the real wage data are in 1939 pesos). In other words, in thirteen years real wages dropped 39 percent. The 1939 wage level was not recovered until the last year of the survey, 1963, when it reached 27.62 pesos (1939), only 2.7 percent above the original level.

From 1940 to 1945 real earnings dropped almost 30%, and then almost 10% between 1945 and 1950. After 1950, however, real earnings increased—10% from 1950 to 1955, and more than 20% between 1955 and 1960. Thus, in 1963 the index of real earnings stood slightly higher than it had in 1940...⁷⁸

Summing up the entire period, he stated,

There was a considerable drop in real earnings during the early 1940s, a stagnation during the 1945 to 1955 period, and a strong upward movement from 1955 to 1963.⁷⁹

Everett's quantitative conclusions reinforced those of earlier authors, as well as expanding the available real wage series to 1963.

From the 1930s to the 1960s wage studies evolved in their use of sources. From minimum wage figures to a gov-

⁷⁵ Everett, "Evolution of the Mexican Wage," p. 4.

⁷⁶ *Ibid.*, p. 47.

⁷⁷ *Ibid.*, p. 12.

⁷⁸ *Ibid.*, p. 11.

⁷⁹ *Ibid.*, p. 36.

ernment survey, the studies moved toward less synthetic sources, toward those that captured actual wage levels. Similarly, from the early, unsophisticated government price indices, the studies moved toward modifications that would better capture the actual price level.

Since then, wage studies have continued to evolve in roughly three broad areas: sources, long wage series, and wage differentials. With respect to the first, my *Los salarios industriales en la Ciudad de México* took wage methods a step further by employing the original questionnaires.⁸⁰ Another advance in wage sources is the use of labor contracts themselves. Three important studies were carried out in this area, two by Zazueta and Vega in 1981, and another by Soto and Ramírez in 1985.⁸¹

The use of long real wage series has a deep tradition in the literature, and it continues today with greater emphasis. The ongoing economic crisis since 1982 has resulted in the steepest wage decline in the country's recent history, and scholars still debate its measurement. Sad to say, most of these studies continue to use the legal minimum wage without reference to actual wage levels. There have been some exceptions, however.

In 1981 Carlos Márquez published "Nivel del salario y dispersión de la estructura salarial (1939-1977)."⁸² He used the DGE's wage survey to trace not only the evolution of wages in the postwar period, but also the changes in wage groups. Márquez tries to show an inverse relationship between changes in the base wage and changes in wage dispersion. In the tradition of such studies as those by Villarreal, Márquez employs sophisticated quantitative reasoning while questioning little the sources. He concluded that institutional factors—government intervention in the minimum wage and unions—were important to explain the dynamic of the wage spread in Mexican industry.

In 1981 and 1985 I published a pair of studies that showed that Mexican real wages tend to move in long cycles. Unlike most earlier analyses, these relate long wage movement to the historical evolution of the Mexican labor market.⁸³

The third area of wage studies has been the exploration of wage differentials. Three important studies appeared. In 1982 Carlos Márquez, continuing his pioneering wage studies,

published "Las diferenciales salariales interindustriales: 1965, 1970 y 1975."⁸⁴ Returning to a problem that Everett had explored, Márquez tried to demonstrate that inter-industry wage differentials could be explained by key economic and social variables through a linear regression model. With the industrial censuses as the primary source, Márquez demonstrates that institutional variables can explain an important part of inter-industry wage differentials.

In 1985 Raúl Urbán and I used an analysis of variance model to explore the relationship between branch and occupation wage means.⁸⁵ We found that the industry branch played a greater role in wage determination than did the occupation.

An important part of wage differentials are fringe benefits. In 1985 Israel Núñez published "Prestaciones sociales y estructura salarial en México."⁸⁶ The author uses a variety of primary sources, including labor contracts, to demonstrate, not surprisingly, that industries with higher wages also tend to have more fringe benefits. This is qualified by the fundamental benefits paid by the State rather than the individual businesses.

Summary

I have reviewed the general trends in quantitative studies on modern Mexico, as well as the evolution of income distribution and real wages. In the last thirty years quantitative studies have shifted their focus from the more general to the more specific. The use of mathematical instruments has become more sophisticated. While the analysis of the raw sources lagged behind the statistical advances, there was even some advance in this area, especially in the Wilkie, Everett, Reynolds, and van Ginneken studies. Nonetheless, all of the authors persisted in using published sources, albeit in creative ways. Finally, over time, non-economists have increasingly entered the field of quantitative social analysis, although economists tended to be more adventurous in their mathematics.

Among the more important quantitative studies were those that tried to measure and explain Mexico's income distribution. Their findings showed that functional income distribution followed a cyclical pattern. Labor's share of GDP has always been low in comparison with other countries, but has not remained constant. It stood at 30.5 percent in 1939, dropped to 21.5 percent in 1946, then gradually rose to 33.3 percent by 1967.

⁸⁰ Jeffrey Bortz, *Los salarios industriales en la Ciudad de México* (Mexico, 1988).

⁸¹ César Zazueta and José Luis Vega, *Comportamiento de la negociación de salarios contractuales* (Mexico: CENIET, 1981); César Zazueta and José Luis Vega, *Salarios contractuales vs coyuntura económica* (Mexico: CENIET, 1981); José Luis Soto Aguilera and Daniel Ramírez Díaz, "El salario rural en México," in Bortz et al., *La estructura de salarios*, pp. 247-314.

⁸² Carlos Márquez, "Nivel del salario y dispersión de la estructura salarial (1939-1977)," *Economía Mexicana*, no. 3, 1981, pp. 45-64.

⁸³ Jeffrey Bortz, "La determinación del salario en México," *Coyoacán* (July-September 1981); Jeffrey Bortz, "Salarios y ciclos largos en la economía mexicana," *Coyoacán* (January-June 1985).

⁸⁴ Carlos Márquez, "Las diferenciales salariales interindustriales: 1965, 1970 y 1975," *Economía Mexicana*, no. 4, 1982, pp. 157-167.

⁸⁵ Jeffrey Bortz and Raúl Urbán Ruiz, "Los salarios y la estructura ocupacional en el sector industrial," in Bortz, *La estructura de salarios*, pp. 223-246.

⁸⁶ Israel Núñez, "Prestaciones sociales y estructura salarial en México," in Bortz, *La estructura de salarios*, pp. 315-366.

Unlike functional income distribution, the sharing of family income has not been cyclical. Instead, it has slowly worsened. In 1950 the poorest 50 percent of the families received 19.1 percent of the total income; their share dropped to 15.7 percent in 1963. The poorest 20 percent of families in 1950 took in 6.1 percent of the income; their share dropped to 4.1 percent in 1975. These data are reflected in the Gini coefficients, which grew from .50 in 1950 to .55 in 1963 (.5439 according to Gollas), and then to .5659 in 1975, indicating steadily increasing inequality of income distribution.

Price index and real wage studies were fewer in number and quality than the income distribution analyses, although the last decade has seen a relative flowering of this field. A complete review, including index values, of all Mexican price indices was never published. It was not until 1977 that the government published a good list. It was only in the 1980s that the major statistical agencies published relatively good historical summaries. Of those who constructed real wage

tables, only Mike Everett tried to modify the existing and deficient indices.

Most real wage studies employed the legal minimum wage, and remained quite limited in scope. Noyola Vázquez, López Rosado, Everett, Bortz, Vega, Zazueta, and Márquez were among the few researchers to treat actual industrial wages. Their findings showed that real wages followed a cyclical movement similar to functional income distribution. In constant 1939 pesos, the real average industrial wage dropped from 26.92 pesos in 1939 to 18.53 pesos in 1944. It dropped again by 1952, reaching 16.48 pesos. The real wage then steadily rose to 27.65 pesos in 1963. All the evidence indicates that Mexican workers did not share proportionately in their country's economic growth in the 1940-75 period. As quantitative history of modern Mexico has advanced in techniques and sources, it has been able to demonstrate that Mexican development did not benefit all groups equally. As it continues to advance in the future, it will be better able to specify social and economic inequality in this rapidly industrializing country.