Argentina: A decade of currency board

An analysis of growth, employment, and income distribution

Mario Damill
Roberto Frenkel
Roxana Maurizio

Centro de Estudios de Estado y Sociedad
Buenos Aires

Abstract

The paper begins by presenting and testing a macroeconomic model for the Argentine economy under the convertibility regime of the nineties. We then present and test a model for the labor market to explain the aggregate behavior of employment, underemployment, and unemployment. An analysis of the "anatomy" of employment follows with a description of its composition by activity sector and by category of worker. The evolution of average incomes of both the employed and active individuals is examined, to focus later on their behavior for different labor categories: by type of occupation, gender, and educational level. We next focus on income distribution. Gini and Theil indexes are estimated for households, as well as for both the employed workers and the active population. The Theil index is decomposed to capture the separate impact of three different factors on income distribution inequality among jobholders. Firstly, the impact of changes in inequality *within* groups; secondly, the effect of changes *between* groups, and finally, the impact of the evolution of the structure of employment by category. A wage function is also estimated to determine the reaction of real incomes to changes in the unemployment rate. We then employ a methodology of microsimulations based on microdata from a household survey to assess the separate effect of several variables (like the unemployment rate, the structure of employment, the incomes by category, and the educational levels of the workforce) on the Gini index of income inequality. Finally, the analysis of income distribution is completed by examining the evolution of poverty and indigence in the nineties.

Authors' E-Mail Addresses:
damill@cedes.org
frenkelr@bapro.com.ar
roxana@pbgciudad.com.ar

Preface

In the 1990s, the countries of Latin America undertook important transformations in macroeconomic policies, particularly stabilization measures, that had a serious impact on the labour market and the distribution of income. While economic growth picked up with a fair degree of stable prices, labour demand did not grow sufficiently to meet the pressures of labour supply. As a result, the level of unemployment increased, especially among the youth.

With regards to structural change, this period also witnessed a simultaneous process of trade and financial liberalization, as well as a major shift towards privatization and a reduction in importance of the role of the public sector.

The Argentinean case is interesting and different from other countries, in that it applied throughout the decade convertibility of its currency, the Argentinean peso, and pegged it to the US dollar. This resulted in ending hyperinflation and stopped the prevailing inflationary culture, but produced considerable inflexibility in absorbing and adjusting to external shocks. Following a first phase of economic expansion in the first half of the 1990s, during which there was a growth of employment and wages, Argentina saw itself exposed to considerable fluctuations in its international liquidity, that resulted in erratic growth. One after another, the crises in Mexico, in East Asia, Russia and Brazil left their imprints on the Argentinean national labour market and also gave rise to a progressive loss of competitiveness.

The authors of this paper, Mario Damill, Roberto Frenkel and Roxana Maurizio, are researchers in the Centre of Studies of the State and Society (CEDES) and lecturers in the Faculty of Economic Sciences of the University of Buenos Aires. In this study they present an analysis of the interrelationship that existed between macroeconomic policy, employment and distribution of income in Argentina during this period. The analysis is centered on the economic conditions and compulsions created under the system of convertibility that was abandoned at the beginning of 2002. The paper also highlights the structural imbalances that continue to persist in Argentina.

This study forms part of a project on employment, income inequality and macroeconomic policies developed jointly by the ILO Technical Multidisciplinary team in Santiago and the Employment Analysis Branch of the Employment Strategy Department of the ILO in Geneva.

Rashid Amjad
Director a.i.
Employment Strategy Department

4

Contents

List of tables

Introduction

On December 1, 2001, Domingo Cavallo, Minister of Economy at that time, announced, among other measures, the decision to establish controls and restrictions on transactions in the foreign-exchange market. He thus put an official end to the monetary regime that he himself had launched slightly more than ten years beforehand.

A preliminary version of this article, presented in October 2001, began by stating that Argentina's convertibility regime was near collapse. Three months later we write the final version in a completely new scenario and under a different government. The economic breakdown and a wave of social turmoil and political turbulence brought President De la Rua's Administration to a dramatic end well before the completion of its constitutional term, begun at the end of 1999.

The macroeconomic regime of the nineties, including convertibility of the peso at a 1-to-1 rate with the US dollar, is now history. An entire decade passed from the radiant initial success of the hard pegging of the exchange rate, in April 1991, to its abandonment following a deep recession that persisted for more than three years. Another "lost decade" in many respects, with lasting consequences that are still to be fully developed and understood.

At present, the Argentine economy is struggling to emerge from the many uncertainties that arose with the downfall of the former economic rules and from the difficulties to establish a new setting. It faces the challenge to recover the basic macroeconomic balances in an unfavorable international context.

Argentina embraced a comprehensive economic reform effort at the beginning of the nineties. In addition to convertibility, it included a massive privatization of public utilities, deep trade and financial opening, equal treatment to local and foreign capital, and the de-regulation of domestic markets.

At first, both a drastic disinflation and fast economic growth seemed to prove this combination right.

Other reforms, like the autonomy of the Central Bank and the reorganization of the pension system were later implemented as additional measures to consolidate the institutional framework of the new macroeconomic setting.

Unfortunately, some negative signals were already perceptible during the initial expansionary phase that preceded the Tequila episode of late 1994. This is not only true regarding the rising financial vulnerability to sudden stops or reversions of capital inflows. In effect, well before the impact of the spillover of the Mexican crisis, some labor-market indicators began to deteriorate. In particular, the lack of dynamism in employment creation became evident as a kind of anomaly in a period of fast economic growth. Additionally, distributive indicators like the incidence of indigence among both households and individuals were also showing an early worsening.

In the second half of the nineties, a much poorer macroeconomic performance lay behind a generalized deterioration of labor-market and income-distribution indexes. This phase led to a deep crisis and the breakdown of the regime in December 2001.[1]

One of the main purposes of this paper is to examine the behavior of the main labor-market and income-distribution indicators in the nineties from a macroeconomic standpoint.

---

[1] We do not examine the crisis here. The period of the analysis goes from the beginning of the nineties to the first semester of 2001 (or to the second semester of 2000 in some cases, depending on data availability).

Therefore, we begin with a macroeconomic analysis in Chapter 1. We present the main stylized facts of the decade, followed by a simple macro model for the Argentine economy under the convertibility regime and its empirical tests.

Chapter 2 analyses aggregate employment, underemployment, and unemployment evolution. We begin with the main stylized facts of the period and then explore the connections between these labor-market variables and the macroeconomic processes examined in Chapter 1. An aggregated model of the labor market is also presented and tested.

Having developed the analysis at the macro level, we then take a closer look at the evolution of both the structure of the labor market and income distribution. In Chapter 3 we focus on the "anatomy" of employment and unemployment throughout the nineties. That is, we describe how the aggregate behavior of those variables is decomposed by type of occupation, activity sector, position in household, and gender. A model to explain employment evolution in the industrial sector is also developed and tested here.

Chapter 4 follows with an analysis of the evolution of the average real income of both employed workers and the active population in the nineties. The section, as well as the income distribution analysis we present later, is based on data from a permanent survey of households conducted semi-annually by INDEC (Instituto Nacional de Estadística y Censos). As is mentioned in the text, the income variations estimated from this source are roughly compatible with the macro data from the National Accounting System.

We next begin to examine income distribution in Chapter 5. Gini and Theil indexes are obtained and analyzed for households, employed workers, and the active population.

In Chapter 6, we focus particularly on employed workers' average real income. We decompose its variations in the period in an "income effect" and a "structure effect" that capture the impact of both changes in average incomes per category, on the one hand, and changes in the composition of employment by category, on the other. The explored categories are type of occupation, educational level, and gender.

Chapter 7 presents an analysis of income distribution among the employed workers. It is based on a decomposition of Theil indexes that makes it possible to identify the separate impact of changes within groups of workers (within effect), between different groups (between effect), and a structural effect. The different groups were defined adopting the same categories employed in Chapter 6: type of occupation, educational level, and gender.

We then focus on wage determination in Chapter 8. The section shows that a negative elasticity of real wages to unemployment rates can be proved statistically significant. This relation captures an indirect impact of unemployment on population's incomes that is an important explanatory factor of the evolution of income distribution in the nineties.

Chapter 9 then presents an integrated analysis of the different factors affecting income distribution. We reproduce here some results included in previous works based on a methodology of microsimulations applied to data from the permanent survey of households we have already mentioned.[2]

An analysis of the evolution of poverty and indigence and some major determinants of them is presented in Chapter 10, based on data from the same source.

Finally, Chapter 11 closes the paper with a synthesis and conclusions.

---

[2] Frenkel and González Rozada (2000a and 2000b).

1. Macroeconomic evolution in the nineties

1. 1 Stylized facts

Inflation and stabilization

Argentina's macroeconomic performance experienced a dramatic change at the beginning of the nineties. Two main accomplishments stand out: the check on high inflation and the recovery of a positive GDP growth rate after a lengthy period of economic stagnation.[3]

The high inflation regime, a complex set of institutions, rules and practices that developed as an adaptation to a long-lasting inflationary environment, collapsed with two hyperinflationary episodes in 1989 and 1990.

By March 1990, the second hyperinflation could be stopped thanks to a set of stringent fiscal and monetary measures. From then to the end of the year, in a context of strong uncertainty, the nominal exchange rate remained almost constant, under a dirty floating, while monthly increases of the main price indexes still averaged about 10 to 11 per cent. Thus, a huge and fast real appreciation followed the steep depreciation of the domestic money that had been observed in the hyperinflationary episodes.

Later, at the beginning of 1991, a new speculative bubble in the foreign-exchange market drove the floating exchange rate up again. Its impact on prices threatened to lead the economy once more to hyperinflation.

Then, in February 1991, a new stabilization plan was launched, based on the fixing of the exchange rate. Two months later, in April, Parliament reinforced the program with the approval of the Convertibility Law. This legal instrument made the peso convertible in US dollars at a one-to-one rate,[4] and obliged the monetary authorities to maintain full backing of the monetary base in foreign reserves.[5]

The Law also banned any kind of automatic price adjustment linked to domestic price indexes (price indexation was one of the core practices of the high-inflation regime). Additionally, it made domestic payments and contracts in foreign currencies legally valid, an element that would prove to be particularly relevant later, because it would allow for a significant and persistent trend for the domestic financial transactions to dollarize. The stabilization program also involved price negotiations between the government and several productive sectors, aimed to reinforce the effect of the exchange-rate pegging as a nominal anchor on inflation. Furthermore, it was preceded by a set of measures that deepened the trade opening. [6]

---

[3] See Figures 1 and 11. All figures are included at the end of the document. All data on macroeconomic, balance-of payment's or monetary variables referred to in the text are based on the statistics published by the Ministry of Economy and available at: http://www.mecon.gov.ar. The same is true regarding information on prices and inflation, with the exception of nominal wages, obtained from ECLAC, Buenos Aires. Information regarding labor-market variables or distributive ones examined in Chapters 3 to 10 come from the national survey of households conducted by INDEC (Encuesta Permanente de Hogares, EPH), and refer alternatively to the Greater Buenos Aires or to 11 urban centers (including the GBA), as explained in the text. The eleven considered urban centers (out of a total number of 28 in the sample) represent 55% of the total urban population, while the GBA represents about 37% of it. Data about output and employment in the manufactures analyzed in Chapter 3 come from a Survey of Industrial Firms monthly published by INDEC.

[4] Actually, the initial parity was "one US dollar-ten thousand 'australes'." A monetary reform changed the domestic money denomination shortly afterwards, making one peso equivalent to ten thousand 'australes.'

[5] With some flexibility margins to be pointed out below.

[6] A gradual trade opening had begun around 1987. The average tariff was reduced from 43% to 30% in 1988 and non-tariff barriers were also lowered. The process was deepened in 1989-1991. At the beginning of the

The program was very successful at curbing high inflation, as Figure 11 shows. After having peaked at four-digit yearly figures in the hyperinflation period, the rate of increase of domestic prices fell swiftly and steadily from the first quarter of 1991.

The stabilization policy had an immediate effect on the prices of tradable goods, represented in the graph by the wholesale price index –WPI. The fixing of the exchange rate resulted in a sudden convergence with international inflation.

The case with non-tradable goods and services, represented in the graph by the consumer price index –CPI, was markedly different. CPI rates of variation also dropped, but were still considerably higher than foreign inflation until the end of 1994. However, from then on domestic inflation remained below international levels. More precisely, domestic prices have been showing a slightly deflationary trend since 1996, as can be observed in the following table.

Table 1
Accumulated variation of domestic and foreign prices (%)

Period (quarters)	CPI	WPI	US-CPI (*)
1991:2-1995:1	47.8	11.5	11.3
1995:1-2001:1	-1.0	2.5	16.6

(*) US Consumer-Price Index.

From 1991:2 (the first quarter under the stabilization program) to 1995:1 the wholesale price index almost exactly replicated the evolution of foreign prices, but CPI rates of variation were about four times higher. From then on, the ratio of domestic to foreign prices declined according to both domestic indexes, as the table shows (and Figure 12 illustrates).

Hence, the launching of the stabilization program was followed by a real appreciation of the peso (reflected by a falling WPI/CPI ratio), as is generally the case with exchange-rate-based anti-inflationary policies.

However, as we can see in Figure 13, the most intense appreciation preceded the convertibility period. It was particularly intense in 1990, after the second hyperinflationary episode. As we have already mentioned, between March and December of that year, under a dirty floating regime, the nominal exchange rate was kept almost stable (it increased by only 7.4 per cent), while the consumer price index climbed by 155 per cent (that is, at about 11 per cent a month on average). This phenomenon can be clearly appreciated in the following table, which shows the evolution of the real exchange rate from the mid-eighties.

---

convertibility regime, there subsisted no more import items subject either to specific duties or to licensing requirements. A few remaining restrictions applied to 25 items (out of about 10,000), including cars and auto parts. Special tariffs subsisted only for cars and electronics with a 35% rate. In April 1991 the tariff structure included three levels: zero for raw materials, 11% for intermediate inputs and capital goods, and 22% for final goods. As we have already mentioned, the reform process involved an impressive series of privatizations, financial opening, and de-regulation. At the beginning of President Menem's administration, in 1989, two laws (the Economic Emergency Law and the Law for the Reform of the State) were passed. Among other elements, these laws established equal treatment for foreign and local capital, suppressed several mechanisms to subsidize private activities, and established the legal basis for the privatization process that would follow.

Table 2
Average real exchange rate in different periods
(second semester of 1986=1)

Period	1986-1988	1986-1990	1990:4-1991:1	1991:2-1994:4	1995-2000
Real exchange rate	1.16	1.22	0.62	0.52	0.51

The real exchange rate fell by about 49 per cent between 1986-90 and the period before the launching of the stabilization plan. In contrast, the average real parity in the second half of the nineties happened to be almost the same of the beginning of the convertibility period, represented by the 1991:2-1994:4 average.

Therefore, these figures suggest that the movements of the real exchange rate during the convertibility period can be considered second-order variations if compared with those observed at the beginning of the nineties.

A similar conclusion can be drawn from the evolution of the average wages presented in the following table.

Table 3
Average wages in manufactures in different periods
(second semester of 1986=100)

Period	1986-1988	1986-1990	1990:4-1991:1	1991:2-1994:4	1995-2000
Real wage (*)	90.8	82.8	80.0	73.3	72.8
Wage in dollars(**)	80.6	74.1	129.7	142.4	143.0

(*) Average wage deflated by CPI.
(**) Average wage in constant US dollars (deflated by US-CPI).

Domestic wages in constant US dollars jumped upwards by a striking 75 per cent between the second half of the eighties and the period before the launching of the stabilization program (1990:4-1991:1 in the table). In comparison, the observed variations in the nineties are clearly of second order.

Real wages also showed minor variations from the end of 1991 (see Figure 14). In contrast with wages in dollars, which increased sharply at the beginning of the period, real wages suffered a decline. The divergence between both wage indexes is a consequence of the behavior of prices of non-tradable goods and services. These have a significant weight in the CPI and climbed much faster than both the exchange rate and the average price of tradable goods in 1990 and at the beginning of the convertibility period.

Output growth

While important progress was being made to control inflation, aggregate output also began to increase swiftly at the beginning of the nineties.

Domestic product registered a fast recovery from the second quarter of 1990, following the end of the second hyperinflationary episode.[7] The activity level had then been at an absolute minimum since 1980 (see Figure 1). From that floor to the 1994:4 peak the increase in the GDP at constant prices amounted to 41.5 per cent, with an average annual rate of growth of 7.6 per cent.

However, in contrast with the success in price stabilization, this improved growth performance could not be sustained throughout the entire decade. Instead, the real economy went through two neat cycles in the nineties.

---

[7] The first hyperinflation occurred in 1989:2.

Even though the initial expansion was quite long, lasting for almost five years, it was still followed by the 1995 recession owing to the Tequila episode. Nevertheless, this contractionary period lasted only three quarters. From peak to bottom, the fall in real output amounted to about 6 per cent.

It followed a new expansion, briefer than the earlier one (eleven quarters long, extended from 1995:4 to 1998:2). In this second expansionary period the accumulated GDP growth was 22 per cent and the annual rate of growth exactly matched that in the early nineties: 7.6 per cent.

This phase came to an end with the impact of the Russian crisis in the third quarter of 1998. Since then, the Argentine economy has been immersed in an unusually persistent contractionary trend. From the last peak to 2001:1 (the latest available figure), the real output fell by 6.2 per cent. The decline was led by investment that decreased by 25.5 per cent causing a significant fall in the ratio of investment to output (Figure 15). Real consumption also contracted, but at a softer pace. Therefore, the ratio of consumption to GDP moved upwards.

Hence, in spite of the swift expansion than followed the Tequila episode, the growth performance in the second half of the nineties was markedly poor.

In Figure 1 we present the GDP trend as estimated using the Hodrick-Prescott filter. It can be seen that the eighties' output pattern (short and deep fluctuations around a stagnated trend) gave rise to a very different behavior from 1990.

GDP-trend growth became positive and surpassed 4 per cent a year from 1993 to 1995. But it has since been steadily declining, recently plummeting to nearly 0 per cent a year and still falling.

Capital inflows

A basic factor behind the remarkable improvement in macroeconomic behavior in the early nineties was undoubtedly the renewed access to foreign credit.

This can be partially explained by a significant and positive change in the international financial markets. The international interest rates dropped abruptly from late 1989. With the fall in the rate of return of financial investments in the developed world, the emerging economies began to receive increasing flows of direct and financial investment. Argentina followed Mexico as the main recipient of the renewed capital inflows to Latin America in the early nineties. Hence, after about ten years of credit rationing, the country began to receive significant net inflows of funds. In 1993-94 these inflows peaked to about 13.1 billion US dollars a year (equivalent to an average of 5.3 per cent of GDP, see Table 4a below). From 1992 to 1995, about 20 per cent of the net capital inflows were FDI flows obtained through privatizations of public utilities.

To weight the relative significance of these figures they can be contrasted with the level of the domestic monetary aggregates at the beginning of the stabilization process. The monetary base at the end of 1991:1 amounted to only about 3.5 billion US dollars, and the broadest private monetary aggregate (M4) was slightly above 8.8 billion. Given this, the renewed capital inflows triggered very strong increases in the level of reserves and the monetary base, as well as in domestic deposits and credit aggregates (see Figure 9a).

The expansion in foreign and domestic credit made a swift recovery of consumption and investment expenditures possible. In other words, domestic absorption experienced a sudden growth at the beginning of the period. Therefore, a central feature of the new phase was the extraordinary change in the ratio of domestic absorption to GDP. As Figure 2 shows, domestic absorption was systematically lower than GDP between 1982 and 1990 as a result of the need to transfer a significant amount of real resources to the rest of the world for debt services in a period of credit rationing. But from 1990 an abrupt

change took place, reversing the ratio between absorption and GDP. From 1990 to 1994 this ratio increased by an impressive 8.5 per cent (as a proportion of the domestic product), thus revealing the magnitude of the positive shock experienced in the period.

The current account

Trade balance

Fueled by capital inflows, the economic expansion of the early nineties had an immediate consequence on the trade balance (as was implied by the preceding comments regarding the behavior of domestic absorption).

Figure 3 illustrates a clear negative correlation between the economy's position in the cycle (showed in the figure by the "detrended real output" line obtained as the difference between the actual GDP and its Hodrick-Prescott trend), and the trade balance. This behavior results from the strong positive correlation that exists between the volume of imports and the output level.

It can be observed, in particular, that the long expansionary phase of the early nineties had a clear counterpart in an equally long negative evolution of the trade balance. In this period the economy passed from having a sustained trade surplus in the eighties to a deficit. It can also be seen that, from then, the economy could only attain a trade surplus in periods of recession: 1995 and 2000/2001.

In Figure 4 we present the evolution of the trade balance showing the separate behavior of exports and imports. Again, the change experienced between 1990 and 1994 stands out. During this period the flow of exports declined as a proportion of GDP while imports were soaring, passing from a very depressed level (below 4 per cent of GDP) to more than 10 per cent.

Net interest payments and the current account

While the trade balance follows a clearly counter-cyclical pattern, the rest of the current account of the balance of payments showed a well-defined trend during the nineties (see Figure 5). Net interest payments increased steadily until late 1998, as did the total amount of net investment income payments abroad.[8]

However, net interest payments measured in constant US dollars stabilized during the recessionary period of the late nineties.[9]

Given that the trade balance registered deficits for most of the decade (with the exception of a short interval in 1995 and the present phase in 2000/2001), and that the deficit in financial services has also been permanent, the current-account result has been systematically negative in the convertibility period. The deficit averaged 3.6 per cent of GDP between 1993 and 2000, showing a cyclical pattern derived from the behavior of the trade flows. Therefore, the current account deficit increased between 1990 and 1994, then fell in 1995, increased again throughout the second economic expansion in the nineties and declined once again in the recession that followed the Russian crisis (see Table 4a).

---

[8] This item includes interest and profits (computed on an accrual basis), as well as dividend payments.

[9] This can be attributed to several factors, including a decline in the rate of increase of the foreign debt (see Figure 10) and a fall in international interest rates. The decline in the growth of foreign obligations reflected a smaller current-account deficit as a consequence of the recession, as well as a smaller increase in foreign reserves, and a rise in FDI inflows.

The balance of payments and reserve accumulation

In the early nineties until the first quarter of 1994, net capital inflows generally surpassed the current account deficit, allowing for a sustained accumulation of foreign reserves. This made a persistent increase in monetary aggregates and domestic credit possible, as Figure 9a shows, thus fueling the increase in aggregate demand and output.

However, a change can be observed in 1994 (see Figure 6a). Capital inflows decelerated and foreign reserves ceased to increase. This was a prelude to the significant capital outflows in 1995. Nonetheless, after a short period the previous pattern of positive capital inflows and accumulation of foreign exchange reserves was re-established.

But capital inflows once again showed a declining trend from mid-1998 (when the level of foreign reserves ceased to increase, as Figure 9 illustrates), to become negative in 2001:1. A clear correspondence between this behavior of capital movements and the cyclical evolution of the activity level can be observed.

The recession of the mid-nineties

The decline in capital inflows observed in 1994 proceeded the increase in the federal funds rate impulsed by the Fed from February of that year. That signal of a more contractionary stance of the US monetary policy was followed by a more than proportional increase in country-risk premia in emerging markets. Of the Latin-American economies, the increase in the country-risk differential in interest rates was even greater in the cases of Mexico and Argentina. At that time, both countries showed the worst indicators of external fragility among the largest economies in the area, appearing to be the most vulnerable to a possible deterioration in the international financial scenario. In both cases, indicators like the ratio of the current-account deficit to exports, or the quotient between the foreign debt and exports were not only well above the regional average, but also steadily increasing. In both countries, stabilization programs based on the use of the exchange rate as a nominal anchor to the price system had led to sustained and deep appreciation of the domestic currency and to growing current-account deficits. Capital inflows –under extremely liberal capital-account regimes- made these trends viable until 1994, but at a cost in terms of higher vulnerability to negative foreign shocks.

The rise in international interest rates, combined with higher financial fragility, can explain the decline in capital inflows. Foreign reserves stopped increasing in both countries, and Mexico began to show a decline: a prologue to a speculative attack against the peso that finally led to a balance-of-payments crisis and to the exchange-rate depreciation in December 1994.

The many similarities between the macroeconomic configuration of Mexico and Argentina at that time made the spillover of the crisis to the latter economy only too probable. Capital flows to Argentina became negative during the first half of 1995 while the country-risk premium skyrocketed.[10]

On the one hand, liquidity contraction and higher interest rates caused a swift decline in the activity level. On the other, the fall in bank deposits, together with the negative effect of both higher interest rates and recession on the financial strength of domestic borrowers, led to the failure of several banks and a financial crisis exploded.

---

[10] See Figure 8b. However, the quarterly averages presented there naturally smooth the observed ups and downs.

Foreign financial support and a rapid recovery after 1995

In 1995, a relatively rapid control of the financial crisis and the recovery of the activity level were made possible by a strong financial-support package structured with the coordination of the IMF. The operation amounted to about 11 billion US dollars and helped the Argentine government to halt the bank run and the loss of reserves. Thanks to the foreign support, the authorities were able to display an intense monetary activism to back the banks and stop the deepening of the crisis, while respecting the full backing of the monetary base with foreign assets as established by law.[11]

Figures 7a and 7b show the important role that foreign credit to the public sector had in this period. Unlike the pre-1995 pattern, when private inflows had been predominant (in spite of the privatization process), the year 1995 witnessed an important private outflow, concentrated in the first semester. Net inflows to the public sector were, on the contrary, increasing as a consequence of the support package and allowed for some counter-cyclical policy activism, as we have already mentioned.

The change in the composition of capital inflows after the Tequila episode was not completely reversed thereafter. Net capital inflows to the public sector remained higher than in the pre-1995 phase, averaging about 2.2 billion US dollars a quarter between 1995 and 2000.

At the same time, private inflows remained slack for a long period. Only in 1997-98 did they again surpass public inflows to fall once more after the Russian crisis in 1998.

Thus, it is clear that, unlike the 1991-94 period, the second economic expansion in the nineties (between 1995:4 and 1998:2) was bolstered mainly by capital inflows directed to the public sector. Private inflows played a relatively less important role.

In other words, output growth in the second half of the nineties was much more dependent on the ability of the public sector to access foreign credit.

Foreign borrowing by the public sector was important not only to finance the government deficit, but also to supply the economy with foreign currency.

In effect, a decomposition of the balance of payments by sector for the whole 1992-2000 period shows that the accumulation of reserves at the Central Bank (of about 19.5 US billion dollars between those years) was completely explained by a positive balance of the public sector in its transactions with non residents. This result came close to 33 billion dollars. In other words, the government obtained much more net foreign funds that needed to fulfill its commitments with foreign creditors in concept or interest and amortization. In contrast, the private sector showed a deficit (see Table 4b below).[12] The importance of this evidence is enhanced by the fact that, under the convertibility regime, the accumulation of reserves is the foundation of both domestic money and credit creation.

The Table 4b also shows that the net financial inflows directed to the private sector were negative (-1.886 billion US dollars) in the consolidated figures of the entire period. However, the total foreign debt of this sector was growing at a very high rate in the same years (26.5 per cent annually). There is no contradiction: as the Table 4c evidences, there was an impressive accumulation of foreign assets in the private portfolios in the nineties. Their stock has been estimated at 94,073 billion US dollars at the end of 2000 for the non-financial private sector. Including the financial institutions, this total climbs to more than

---

[11] The Convertibility Law established that the definition of foreign reserves to be considered as backing of the monetary base could include a 20% maximum of US dollar-denominated bonds of the Argentine government. This flexibility margin had not previously been used. Therefore, the Central Bank was able to issue pesos backing the new emission with part of its public bonds holdings. Furthermore, this limit was increased to 30% in the midst of the crisis. Beyond that, part of the liquidity offered to support the banks came from funds that had been obtained with the support package.

[12] The point has been presented and examined in Damill (2000).

112 billion. Thus, the consolidated private sector was actually a net creditor of the rest of the world by the end of the convertibility period.

Vulnerability and depression

Fostered by capital inflows and the accumulation of reserves, the second expansion in the nineties was again followed by a deterioration in the trade balance and an increase in the current account deficit. The latter can be seen in Table 4a below.

The current account deficit had fallen to 2 per cent of GDP as a consequence of the Tequila adjustment in 1995. But it had more than doubled two years later and kept climbing to nearly 5 per cent of GDP in 1998, a higher level than the current account imbalance that had been observed in 1994, before the crisis in the mid-nineties.

The sustained deficits in the current account were reflected in a steep increase in the foreign debt and in foreign indebtedness indicators (Figure 10). Having been below 30 per cent in 1993, the foreign debt/GDP ratio was about 45 per cent in mid-1998 (to rise to over 50 per cent in 1999).

At the same time, the stock of FDI in the country increased significantly in the nineties. It had been estimated at about US$ 16.3 billion at the end of 1992, reaching 82.85 billion at the end of 2000. It rose by five times in eight years. Table 4b evidences the importance of accumulated net FDI flows, particularly in the case of the private sector. This trend in foreign investment had an impact on the amount of profits and dividends transferred annually to foreign owners.

Thus, after two years of economic expansion the Argentine economy was again showing an increased financial vulnerability to external shocks. However, in spite of higher vulnerability and the impact of the South-East Asian crises, which caused a rise in the country-risk premium, capital inflows peaked to levels of about 6 per cent of GDP in 1997-98.

But a significant decline in private inflows followed the Russian crisis in August 1998 and the Brazilian crisis in early 1999. Both episodes caused the country-risk premium to jump to new highs. From late 1997 on, foreign reserves ceased to increase (see Figure 9a), liquidity indicators decelerated and credit aggregates began to contract, though this occurred later.

Table 4a
Balance-of-payments indicators

Period	NIP/X (1)	NIIP/X (2)	CAD/X (3)	CAD/GDP (4)	KA/GDP (5)
1992	48.3	78.6	180.5	NA	NA
1993	45.9	89.7	244.8	3.4	5.7
1994	44.7	92.5	278.1	4.3	4.9
1995	47.8	88.3	98.2	2.0	2.8
1996	56.4	91.6	113.6	2.5	4.6
1997	63.8	94.1	185.9	4.2	5.7
1998	77.4	112.1	220.2	4.9	6.1
1999	101.1	127.3	204.8	4.2	5.0
2000	90.9	113.8	134.9	3.1	3.2

(1) Net interest payments as a proportion of total exports (%).
(2) Net investment income payments (interests plus profits and dividends) as a proportion of total exports (%).
(3) Current account deficit as a proportion of total exports (%).
(4) Current account deficit as a proportion of GDP at current prices (%).
(5) Capital account surplus as a proportion of GDP at current prices (%).

Table 4b.
Balance of payments, global and by sector
Aggregate net flows, 1992-2000
in million US dollars

	Public Sector (*)	Financial Sector	Private Sector	Total
Current Account	-30,188	-5,031	-51,160	-86,379
Net Direct Investment (**)	14,039	4,566	40,911	59,516
Rest of the Capital Account	49,038	6,389	-1,886	53,541
Total Balance	32,889	5,924	-12,135	(***) 19,459

(*) Includes the Central Bank
(**) Includes net investment in equities
(***) The difference with the sum of partial balances is due to "Errors and Omissions" that amounted to US$ -7,219 million in the period.

Table 4c.
Consolidated balance of payments and accumulation
of foreign assets by sector in the period 1993-2000 (*)
in million US dollars

(1)	Current Account Deficit (**)	78,886
(2)	Accumulation of Reserves at the Central Bank	16,184
(3)	Foreign Assets of the Financial System (***)	14,116
(4)	Foreign Assets of the Private Sector (****)	44,790
(5)	= (1) + (2) + (3) + (4)	153,976
(6)	Foreign Direct Investment (*****)	68,683
(7)	Total Foreign Debt (******)	83,629
(8)	= (6) + (7)	152,312

(*) The period differs from Table 4b because data on foreign assets by sector are not available for 1992 on a comparable basis.
(**) It includes an estimated (accrued) inflow of income payments (interest, profits and dividends) of US$ 24,262 million. Excluding it, the current account deficit would climb to 103,148 million US dollars.
(***) Variation in the period. It excludes the Central Bank.
(****) Variation in the period.
(*****) Total inflow, adjusted including net inflows for investments in equities not considered FDI in the balance-of-payments estimation.
(******) Variation in the period.

Meanwhile, the degree of dollarization of domestic financial transactions increased, particularly fast in the case of deposits, as can be seen in Figure 9b. About 60 per cent of the latter, and more than 65 per cent of total credit of the domestic banks, were denominated in dollars at the end of 1999.

Real output declined from 1998:2. The new contractionary trend has been persistent. As we have already mentioned, in 2001:1, after eleven quarters of recession, the GDP level was 6.2 per cent lower than the previous peak with no turnaround in sight. To the contrary, the negative behavior of aggregate output became even steeper by the end of 2001.

Pro-cyclical fiscal policy and the deflationary scenario

From 1997 the fiscal accounts also worsened significantly (see Figure 16), partially due to the recession. Public receipts suffered from the decline in revenues coming from activity-related taxes like VAT. But other factors acted in the same direction, particularly a relaxation of the fiscal policy in 1999, which probably was a consequence of President Menem's frustrated effort to run for re-election for a third consecutive term. In that year the consolidated fiscal deficit approached 4.5 per cent of GDP (about 3 per cent of GDP higher than the 1997 figures).

In December 1999 a newly elected government took office. Lacking policy instruments and facing a significant and growing fiscal deficit, the new authorities chose to center its macroeconomic management on a contractionary fiscal policy based on tax increases and cuts in spending and aimed to reduce the public sector's borrowing requirements.

Incongruent with the recessionary scenario, the tightening in the fiscal stance was justified with the argument that it would trigger a virtuous circle of greater credibility, lower country-risk premium, private capital inflows, accumulation of reserves, expansion of money and credit, increases in private demand and economic recovery. GDP growth would then promote higher fiscal revenues, thus closing the circle.

The argument assumed that the contractionary effect of tax increases and public expenditure cuts would be more than compensated by the expansion of private demand that would follow the expected decline in country-risk premium.

In a difficult international scenario (with limited access to foreign credit), while the contractionary effects of fiscal tightening were granted, the expected indirect expansionary impact failed to materialize. Therefore, the improvement in the public accounts was only mild and slow, compromising the normal flow of fiscal payments. In light of these discouraging results, the authorities responded by simply reinforcing the policies through several consecutive rounds of fiscal tightening. Nevertheless, the expected virtuous circle could not be triggered. To the contrary, the recessive and deflationary scenario tended to persist, as well as the doubts about the government's capability to fulfill its obligations. Throughout 2001, these trends would feed several rounds of run against the peso and the financial system. The volume of deposits (both denominated in pesos and in US dollars) and the level of reserves fell abruptly, bringing the monetary regime to an end and the government to default in its financial obligations with both foreign and domestic creditors in December, amid a context of severe social and political crises.

1.2 Macroeconomic model and estimation

Macroeconomic model

The stylized macroeconomic facts described in the preceding section can be articulated in a simple macroeconomic model of the Argentine economy under the convertibility regime. The model emphasizes the interactions between the balance-of-payments result and the activity level that we have already outlined.[13]

Under the convertibility rule, the result of the balance of payments (that is, the variation in the stock of reserves, dR) is the basic determinant of the evolution of liquidity and domestic credit. Through this channel, it decisively influences the behavior of domestic demand and the activity level. Real output growth, on the other hand, affects the accumulation of foreign reserves through its impact on imports.

---

[13] A previous version of the model and estimations developed in this section were presented in Frenkel and González Rozada (2000a).

In what follows we assume that nominal prices are given, thus ignoring their potential effects on aggregate demand. As happens with the observed changes in relative prices, those effects can be considered of second order in the period to be analyzed. We also consider both the flow of exports (X) and net capital inflows (KA) exogenous.

Our first equation is the balance-of-payments' identity:

(1) dR = X - M + Z + KA,

where M stands for imports and Z are the net investment income receipts (that are negative in the Argentine case).

Our second expression is the income-expenditure identity:

(2) Y = E + X - M,

where Y stands for aggregate output and E is domestic absorption.

The convertibility rule establishes that:

(3) dB = dR.ER.

B stands for the monetary base and ER for the nominal exchange rate. Thus, B_t equals B_{t-1} plus dB determined in equation (3)[14].

The relevant interest rate (r) is set through an interest rate parity equation:

(4) r = r* + RISKP,

where r* is the international interest rate and RISKP the country-risk premium.

Given r* we assume that Z is:

Z = -r* ∫ KA(h) dh,

where ∫ KA(h) dh is the accumulation of the capital-account balances from the initial moment to t.

It can be assumed that:

RISKP = RISKP (θ, CC, ∫ KA(h) dh/X),

---

[14] For the sake of simplicity, we ignore here the fact that, in addition to the convertibility of the peso, Argentina developed a bi-monetary system in the nineties: a significant part of the domestic financial transactions were denominated in dollars, as we have already mentioned. Thus, the relevant concept for high-powered money is the "bi-monetary base," that includes the cash reserves of the banks on US-dollar denominated deposits. In the same vein, foreign reserves must include these cash reserves of the banks, which were held in part outside the Central Bank (in liquid deposits in foreign financial institutions), and the relevant concept of money supply must include domestic deposits in US dollars. These wider concepts of monetary base, foreign reserves, and money supply were considered in the empirical tests that we present below.

that is, the country-risk premium depends on several variables like the debt-to-exports ratio and the result of the current account of the balance of payments (CC). It also depends on other factors, represented by the symbol θ. This is an exogenous vector aimed to reflect the conditions of the international financial markets. We assume that $RISKP_{CC} < 0$, so that $r_M > 0$.

The sensitivity of RISKP to the result of the current account affects the speed of adjustment of output to the evolution of the balance of payments but not the general result of the model. Therefore, we will simplify by assuming RISKP as exogenous hereinafter.

The main behavioral assumptions are:

(5) $E = E (B, r)$,

and

(6) $M = M (Y, ER)$.

Thus, substituting (5) and (6) into (2) we have:

(2.1) $Y = E (B, r) + X - M (Y, ER)$.

However, the domestic absorption (E) is not measured independently of output (Y) in the Argentine National Accounts. Actually, consumption, the main component of E, is obtained as a residual. Therefore, we have decided to transform the expression (2.1) to adapt it to a more appropriate econometric treatment. In effect, (2.1) can be re-written as:

(2.2) $Y = Y (B, r, ER)$.

Hence, the expressions (2.2) and (6) are the expenditure equations whose estimation for the convertibility period will be presented below.

Before presenting the estimations we solve the model under several simplifying assumptions. In addition to the given nominal prices and the exogenous vector θ, we assume that $(ER = 1)$, that dX is a constant and that there is also a constant net inflow of capital per period $(KA = KA_0)$. We also assume that with this capital inflow, the economy initially has a balance-of-payments surplus and, therefore, the stock of reserves is increasing.

By replacing in the balance-of-payments identity and applying differentials we obtain a differential equation in dB whose solution is:

(7) $dB = dB_0 \, e^{-\varphi t} + (dX - r^* \, KA_0)/ \, \varphi$,

where

$\varphi = M_Y \, Y_B/\alpha$, and

$\alpha = 1 - Y_r \, r_M \, M_Y > 0$, given that $Y_r < 0$; $r_M > 0$ and $M_Y > 0$.

Consequently:

$dY = (Y_B/ \, \alpha \,) \, dB$.

Hence, output growth depends on the balance-of-payments result. With the impulse of capital inflows, the economy initially expands. The subsequent increase in output causes a rise in imports. Debt services also grow. Therefore, the rhythm of reserve accumulation declines, as well as output growth. As the first term of equation (7) tends to zero, R, B and Y tend to a constant growth. The slope of this trend would be positive or negative according to the difference between the increase in exports (dX) and the increase in interest (and profit) payments abroad that follows the inflows of foreign capital. Assuming a constant net inflow of capital, the economy experiences an initial boom that then decelerates to a long-run trend that is a function of exports.

Estimations

We have estimated the expenditure equations (2.2) and (6) in the following general forms:

$$\text{dlog (YR)} = a\ \text{dlog (BR}_{t-1}) + b\ r + c\ \text{dlog (ERR)} + d,$$

and

$$\text{dlog (MR)} = e\ \text{dlog (YR)} + f\ \text{dlog (ERR)} + g,$$

where YR stands for real output, BR_{t-1} is the monetary base in real terms lagged one period, ERR is the real exchange rate and MR are imports at constant prices. In addition, we employed some dummy variables to be described below. The output equation was also estimated replacing the lagged monetary base by other indicators of domestic liquidity, like the level of foreign reserves or the broad monetary aggregate M4, that includes US dollar-denominated deposits of the public. The variable "r" was defined as the sum of the Libo (180 days) rate plus the observed country-risk premium, both in annual terms. The estimation results are the following.

Estimations of the output equation[15]

EQ1) dlog YR = 0.0258 + 0.1383 dlog BR_{t-1} - 0.1607 r - 0.0109 D1 - 0.025 D2 + 0.134 dlog ERR
t-Stat: (4.56)   (3.24)   (-4.04)   (-2.60)   (-7.81)   (1.06)

$R^2 = 0.66$; Adj. $R^2 = 0.61$; Period: 1991:3-2001:1

EQ2) dlog YR = 0.0271 + 0.116 dlog BR_{t-1} - 0.171 r - 0.00939 D1 - 0.0248 D2
t-Stat: (4.56)   (3.24)   (-4.04)   (-2.60)   (-7.81)

$R^2 = 0.65$; Adj. $R^2 = 0.61$; Period: 1991:3-2001:1

The coefficient of the real exchange rate is not statistically significant (EQ 1). Therefore we dropped it in the second estimation. The coefficients of the lagged monetary base are positive and significant in both cases. According to the second equation, a ten-percent increase in the real monetary base in a quarter would cause a GDP growth of 1.16 per cent in the next period.

---

[15] The "t" statistics are included in parenthesis in all estimations and tables of econometric results, under the corresponding coefficient.

As was expected, the sign of the interest-rate coefficient is negative and significant. A relevant interest rate (Libor plus country-risk premium) of 10 per cent (on a yearly basis) would cause a GDP contraction of 1.7 per cent per quarter. The constant term of the equations is positive and significant.

D1 is a dummy variable valued 0 from the beginning of the period to 1998:2 and 1 from then to the end. It captures a permanent change whose initial moment coincides with the spillover of the Russian crisis. In other words, the second recession in the nineties has been deeper than the coefficients of EQ 2 for the previous period can explain, and D1 reflects this phenomenon. It implies a fall in the real GDP of about one percentage point per quarter from 1998:3, not explained by the other terms of the equation.

A second dummy, D2, has zero values for the whole period except 1998:4, when the economy was under the joint impact of the Russian and Brazilian crises. In this quarter, the fall in output was almost 2.5 per cent deeper than that explained by the rest of the model, D1 included.

Additional estimations were made replacing BR by other variables. They are the following.

EQ3) dlog YR = 0.0260 + 0.091 dlog RES_{t-1} - 0.1605 r - 0.00855 D1 - 0.0238 D2
t-Stat: (3.94)   (3.47)   (-3.07)   (-2.20)   (-7.51)

$R^2 = 0.68$;   Adj. $R^2 = 0.64$; Period: 1992:2-2001:1

EQ4) dlog YR = 0.0241 + 0.1387 dlog $M4_{t-1}$ - 0.1588 r - 0.00932 D1 - 0.0248 D2
t-Stat: (2.46)   (1.74)   (-2.64)   (-1.90)   (-7.96)

$R^2 = 0.60$;   Adj. $R^2 = 0.55$; Period: 1991:3-2001:1

RES stands for the stock of foreign reserves in the Central Bank and the domestic banks in real terms and net of government foreign-currency deposits in the Central Bank.

The results in EQ3 and EQ4 confirm the relevance of liquidity and the interest rate for real output determination in the short run.

Estimations of the imports equation

The estimations of the imports equation are the following.

EQ5) dlog MR = -0.00012 + 2.60 dlog YR + 0.362 dlog YR_{t-1} - 0.244 dlog (ERR)
t-Stat: (0.98)   (7.435)   (1.12)   (-0.48)

$R^2 = 0.75$;   Adj. $R^2 = 0.73$; Period: 1993:2-2001:1

EQ6) dlog MR = -0.001 + 2.59 dlog YR + 0.317 dlog YR_{t-1}
 t-Stat: (0.82)   (7.61)   (1.052)

$R^2 = 0.75$;   Adj. $R^2 = 0.74$; Period: 1993:2-2001:1

EQ7) dlog MR = -0.002 + 2.77 dlog YR
t-Stat: (0.64)   (10.095)

R^2 = 0.75;   Adj. R^2 = 0.74; Period: 1993:2-2001:1

It can be observed in EQ5 that, as in the output equations, the coefficient of the real exchange rate is not statistically significant. This can be interpreted as a consequence of the small variance of that variable in the period. The correlation between imports at constant prices (MR) and output is, on the other hand, quite significant and the elasticity is always higher than 2.5.

We can now replace dlogYR in EQ7 by its expression in EQ3. Thus, we obtain an explanation of the behavior of imports as a function of both the lagged increase in foreign reserves and the relevant interest rate:[16]

dlog MR = 0.07 + 0.252 dlog RES_{t-1} – 0.445 r – 0.024 D1 –0.066 D2.

The interpretation of these results is straightforward: With given values for dX, r^*, and, RISKP, and starting from a pre-determined level of the foreign debt, the preceding equation makes the imports behavior (and hence the result of the current account of the balance of payments) in period "t" a function of the variation of foreign reserves in the prior period (dlog RES_{t-1}).

Next, given the current-account balance so obtained and net capital inflows (that we consider here exogenous), the variation of reserves in period "t" is determined (dlog RES_t).

Therewith, given this value for dlog RES_t and the exogenous variables r^* and r_{t+1}, the rate of variation of output in "t+1" is established as showed in EQ3.

And at this point the sequence restarts: given this output variation, the import level and the current-account result for "t+1" are determined simultaneously, and so on.

Thus, the model allows for a clear description of the dynamic interaction between domestic output and the balance of payments in the nineties under the convertibility regime.

2. The labour market

2.1 Stylized facts: employment, underemployment, unemployment

In this section we describe the evolution of aggregate employment and unemployment in the nineties, given the macroeconomic processes analyzed above. The series to be examined here refer to the urban population and are based on a permanent household survey ("Encuesta Permanente de Hogares" –EPH, INDEC) conducted in May and October every year.

Unless otherwise stated, the series in this section are all defined as percentage ratios of the total urban population. They are:

---

[16] Of course, the equation can also be directly estimated. We then obtain:
dlog MR = 0.07 + 0.325 dlog RES_{t-1} - 0.414 r - 0.024 D1 – 0.067 D2
t-Stat: (2.94) (3.81)   (-2.08) (-1.67)   (-5.63)
R^2 = 0.65;   Adj. R^2 = 0.60; Period: 1993:2-2001:1

PART= participation rate,
EMPL= rate of employment,
FTEMPL= full-time employment rate; in the survey, a person is considered to hold a full-time job if she works at least 35 hours a week. However, the published figures include in this group anyone who has being working under 35 hours but does not want to work more (that is, it includes "voluntary underemployment").
SUB = involuntary underemployment (or sub-employment) rate;
U = unemployment rate.

Therefore:

EMPL = FTEMPL + SUB,

PART = EMPL + U.

Figure 17 shows the evolution of these variables since the beginning of the eighties.
To start with, the rate of full-time employment shows a markedly declining trend that becomes steeper from the beginning of the nineties. From about 35 per cent to 36 per cent in the early eighties, FTEMPL fell to 32 per cent in 1990:1 and to 29.4 per cent in 2001:1.[17]
In addition to the negative trend, FTEMPL also shows a clear correlation with the macroeconomic cycle. Like GDP, this variable depicts two neatly defined cycles in the nineties. It increases from 1990, then shows a sharp decline that bottoms in 1996 to climb again with the second economic expansion in the nineties and contract once more from 1998.
However, it is important to note that the peak of FTEMPL in the expansionary period in the early nineties was reached in 1992:2, well before the turning point in the GDP (observed at the end of 1994 after the Mexican crisis). Therefore, in 1993 and 1994 the ratio of full-time jobs to population was dropping while output was still increasing at a very fast pace.
From that peak (34.14 per cent), FTEMPL fell about 5.2 per cent to the bottom point in 1996:2. It recovered by about 2.4 per cent to reach a new peak in 1998:1. Note that this figure is well below the maximum of the former expansion.
The ensuing decline was moderate if compared with the 1992:2-1996:2 period. Nonetheless, FTEMPL was 4 per cent below its 1991:1 level in 2001:1 (ten years after the beginning of the convertibility period).
The ratio of total employment to population (EMPL) also shows a declining trend at the beginning of the nineties, but considerably less steep than FTEMPL, meaning that the rate of sub-occupation (or involuntary underemployment, SUB) tended to increase in the period. The rise in SUB was stronger in 1999-2000, causing the EMPL trend to bend slightly upwards.
Furthermore, as we will show below, SUB has a counter-cyclical behavior, increasing when FTEMPL falls and rising when the latter declines. Therefore, EMPL has a weaker connection with the macroeconomic cycle than FTEMPL.

---

[17] As in Figure 17, we adopt a semi-annual periodization in this section. Thus, we attribute the May observation of the household survey to the first semester of every year and the October observation to the second semester, so that 2000:1, for instance, refers to the first semester of 2000. Furthermore, the symbol % in this section generally refers to "percentage points of the total urban population". However, whenever an ambiguity may arise, we will employ the notation "p.p." (for percentage points of the population).

Finally, the participation rate of the population (PART) shows a markedly positive trend, not correlated to the macroeconomic cycle. From about 38 per cent in 1980, it grew to 39 per cent in 1990 and jumped again to 42.8 per cent in 2001:1. In the convertibility period the PART trend implied an increase of about 1 percent of the urban population every three years.

The main reason behind this behavior has been a sustained increase in women's participation in the labor force, whose level in Argentina is still lower than international standards.

As a result of both PART's positive and EMPL's stagnated trends, the rate of unemployment (U) tended to grow steeply in the nineties (see also Figure 18), presenting a clear jump upwards in the period 1992-1995.

These stylized facts about labor-utilization indicators can be organized in a simple labor-market model with a demand-driven employment level, a counter-cyclical underemployment function and an exogenous participation rate (that follows a positive trend, as we have just showed). Thus, the unemployment rate results from the difference between participation and employment demand. We present the model in the following section.

2.2 A model of the labor market and its estimation[18]

The preceding description clearly shows that the demand for labor, represented particularly by FTEMPL, underwent a deep change in the nineties. Even if the quotient of full-time jobs to population was already falling slowly in the eighties, the next decade merely deepened this trend.

Many factors converge to explain a distinct change in production technology and organization of the productive activity at the firm level in the nineties. Trade opening and the exchange rate appreciation rank among the most important. The observed changes in the demand for domestic goods and in relative prices had an impact on labor utilization by firms. This is also illustrated by Figure 19 and 20. The latter Figure presents the quotient between GDP and the full-time employment ratio. From a stagnated trend in the eighties, the curve shows an impressive upward jump between 1990 and 1996 and stagnates again later.

As we have already suggested, the new macroeconomic setting in the nineties did not emerge gradually. The main institutional changes and the shift in relative prices all took place at the beginning of the period. With that in mind we suggest that the adjustment of the demand for labor to the new setting in the nineties can be conceived of as a gradual adaptation to the new environment defined from the beginning. This problem can be formally handled in the following way.

Firstly, we assume a demand for labor in the form:

$$\log N = \alpha \log YR + \gamma \log (W/PK) + \delta,$$

where N stands for employment, YR for real output and W/PK is the price of labor relative to capital. We compare two points in time. Let t=0 represent a moment before the changes of the nineties, i.e. the eighties. And t=1 represents a moment when the process of adaptation to the new conditions could be considered almost completed, let's say the present. So we have:

---

[18] A previous version of the model and estimations developed in this section was presented in Frenkel and González Rozada (2000a).

$$\log N_0 = \alpha \log YR_0 + \gamma \log (W_0/PK_0) + \delta_0,$$

$$\log N_1 = \alpha \log YR_1 + \gamma \log (W_1/PK_1) + \delta_1,$$

Thus:

$$\Delta \log N = \alpha \Delta \log YR + (B_1 - B_0),$$

with

$$B_0 = \gamma \log (W_0/PK_0) + \delta_0, \text{ and}$$

$$B_1 = \gamma \log (W_1/PK_1) + \delta_1.$$

Considering that relative prices changed at the beginning of the period and then remained fairly stable at the new level, we assume that (B_1-B_0) follows a gradual adjustment with a constant step throughout the period. That is:

$$d(B_1 - B_0) = \beta,$$

from where

$$\int \beta = (B_1 - B_0).$$

Therefore, the employment equation can be formulated as:

$$d\log N = \alpha \, d\log YR + \beta,$$

with $\alpha > 0$ and $\beta < 0,$

where β represents the gradual adjustment of the employment level to the new conditions in the nineties.
In what follows we present econometric estimations of this equation over the period 1980-2001:1, employing EPH data (representative of the urban population, as was explained above). The series are semi-annual and the equations take the following forms:
For the period 1980:1-2001:1 we have:

$$d \log FTEMPL = \alpha_1 \, d\log YR + \alpha_2 \, D90s.d\log YR + \beta \, D90s + \lambda \, Dpost96 + g,$$

and for the nineties:

$$d \log FTEMPL = \alpha \, d\log YR + \lambda \, Dpost96 + \beta.$$

Therefore, our dependent variable is not the rate of variation of full-time employment. Instead, we explain the rate of change of FTEMPL, defined as the ratio of full-time employment to population.[19] But dlog FTEMPL equals the rate of variation of the

---

[19] We chose to follow this procedure because the permanent household survey reports on the variable FTEMPL –and not on absolute employment.

number of people holding full-time jobs (dlog N) minus the rate of population growth (dlog POB), that can be considered roughly constant. Thus:

dlog FTEMPL = dlog N – dlog POB.

Given that, the estimated coefficient for β in the preceding equation will reflect the negative effect on FTEMPL of both the adjustment of employment to the new setting and population growth.

The dummy variable D90s included in the first expression above is zero in the eighties, and 1 from 1991:1 to date. It aims to capture the change in labor demand behavior from the beginning of the convertibility period in two ways. Firstly, by changing the value of the constant term in the equation (through the term βD90s), and secondly, by capturing a possible change in the income elasticity of full-time job creation (through the term α_2 D90s.dlog YR).

The second dummy, included in both expressions and called Dpost96, aims to reflect a new change in labor demand behavior after 1996, as was suggested by the observed change in the tendency of the GDP/FTEMPL ratio (see Figure 20). Therefore, this variable assumes zero values to 1996:2, and 1 from then to date.

The econometric estimations are the following:

EQ8) d log FTEMPL =

$$= 0.2737 \text{ dlog YR} + 0.206 \text{ D90s.dlog YR} - 0.0143 \text{ D90s} + 0.0165 \text{ Dpost96} - 0.005$$
t-Stat: (2.13)   (1.17)   (-2.05)   (1.87)   (-1.27)

$R^2 = 0.316$; Adj. $R^2 = 0.24$; Period: 1980:2-2000:2

and

EQ9) d log FTEMPL = 0.563 dlog YR + 0.02268 Dpost96 –0.02346
t-Stat: (5.46)   (2.97)   (-4.68)

$R^2 = 0.52$; Adj. $R^2 = 0.475$; Period: 1990:1-2001:1

Equation EQ8 shows a significant change in the nineties. The coefficient of D90s (-0.0143) implies a contraction of FTEMPL of 1.43 per cent[20] per semester (about 2.9 per cent a year), which adds to the other elements in the expression. This trend captures the impact of the new macroeconomic scenario and the new set of incentives on the creation of full-time jobs. EQ8 also shows an increase in the income-elasticity of the full-time employment rate after 1990, given by the positive coefficient of the term D90s.dlog YR.

Moreover, another important result is that the estimated coefficient for Dpost96 is positive and approximately compensates for the contractionary effect reflected by the coefficient of D90s. This suggests that the period of adjustment of employment to the new setting can be considered completed by the end of 1996.

The second equation, estimated for the nineties, confirms these results. Firstly, the income-elasticity of FTEMPL is considerably higher than in EQ8. Secondly, the constant term (that is, β in the specification of the model) is negative (-0.02346), reflecting the

---

[20] Here, and in the following comments referred to the coefficients in EQ8 and EQ9, the symbol % refers to percentage variations of FTEMPL and not to "percentage points of the population".

adjustment process (and population growth, as we have explained above). This term implies a 4.7 per cent annual contraction in FTEMPL from 1990. However, we again obtain a positive coefficient for Dpost96. It has about the same absolute value as the constant term, meaning that the negative adjustment trend vanished by late 1996.

We also estimated the FTEMPL equations in the differences of the dependent variable:

EQ10) d FTEMPL =

$$= 9.14 \text{ dlog YR} + 5.54 \text{ D90s.dlog YR} - 0.434 \text{ D90s} + 0.508 \text{ Dpost96} - 0.165$$

t-Stat: (2.36)   (0.84)   (-1.91)   (2.11)   (-1.32)

$R^2 = 0.306$;   Adj. $R^2 = 0.228$; Period: 1980:2-2000:2

and

EQ11)   d FTEMPL = 17.516 dlog YR + 0.70 Dpost96 − 0.72

t-Stat: (5.46)   (3.00)   (-4.59)

$R^2 = 0.52$;   Adj. $R^2 = 0.47$; Period: 1990:1-2001:1

Under this specification the equations allow for an easier interpretation of the meaning of the income elasticity of full-time employment because the coefficients refer to percentage points of the total urban population (p.p.). The dlog YR coefficient (+17.516) in EQ11, for instance, means that one percent augmentation in YR causes full-time jobs to increase by 0.175 p.p.. Or, in other words, aggregate real output has to increase by about 6 per cent to cause the full-time employment rate to rise by one point. On the other hand, the constant term (-0.72) means a fall of full-time jobs of about 1.44 p.p. every year from 1990 to 1996. This amounts to a considerable accumulated decline of 10 p.p. in FTEMPL, evidencing the magnitude of the adjustment process in the nineties. This effect was, however, partially offset by the impact of output growth. Equation EQ11 also confirms that the contractionary trend of the full-time employment rate vanished after 1996, as the Dpost96 coefficient shows.

To complete the description of the aggregate indicators of labor utilization we will now examine the evolution of underemployment, as represented by the rate of the underemployed to total urban population (SUB). As we have already mentioned, SUB has a counter-cyclical behavior, thus it is negatively correlated to full-time employment. This can be described by an equation in the form:

d log SUB = η d log FTEMPL + k, or

d SUB = η d FTEMPL + k.

The econometric estimations are the following:

EQ12)   d log SUB = -1.409 dlog FTEMPL + 0.0203

t-Stat: (-4.06)   (2.31)

$R^2 = 0.39$;   Adj. $R^2 = 0.36$; Period: 1990:1-2001:1

EQ13)   d SUB   =   -0.188 d FTEMPL +0.100

t-Stat: (-4.10)   (2.77)

$R^2 = 0.39$;   Adj. $R^2 = 0.36$; Period: 1990:1-2001:1

The coefficient of FTEMPL in EQ13 means that whenever the number of full-time jobs increases by 1 p.p., we can expect the underemployment rate to decline by 0.188 p.p..

Now, replacing FTEMPL in EQ13 by its expression in EQ11 we have:

dSUB = -3.293 dlog YR –0.1316 Dpost96 + 0.2354.

And adding this equation to EQ11 we now get an expression for the variation of total employment:

dEMPL = dFTEMPL + dSUB =

= 14.223 dlog YR + 0.568 Dpost96 – 0.4846.

Furthermore, considering exogenous the variation of the participation rate (dPART), and taking dEMPL from the previous equation, the description of the labor-market variables we are examining in this section can be completed by obtaining the change in the unemployment rate as:

dU = dPART – dEMPL.

3. The anatomy of employment contraction

3.1 Full-time employment by activity sector

We have previously examined the aggregate employment indicators produced by the national survey of the urban households (EPH). The main urban area, the city of Buenos Aires and Greater Buenos Aires, is representative of about 37 per cent of the entire urban population.[21] For reasons of data availability, we will focus on this subset of the sample to analyze the anatomy of the evolution of employment in this section.

We have just argued that a clear contractionary trend in the full-time employment ratio to population can be identified in the nineties. The following table presents the same ratio by activity sector in GBA.[22] The figures include the beginning and the end of the period, as well as the maxima and minima within it and the difference between the beginning and end (in the column on the right).

We have argued that the combination of trade opening and exchange-rate appreciation had a bearing on employment's contractionary adjustment in the nineties as a

---

[21] In what follows we will call GBA the area comprising the city of Buenos Aires and Greater Buenos Aires.

[22] The definition of full-time jobs in this section is more restrictive than before, excluding the voluntarily underemployed. Meanwhile, it is worth mentioning that GBA data closely follow the national ones. For instance, the change in FTEMPL for the GBA was −1.86 p.p. between 1990:1 and 2000:2 (as shown in the table), amounting to −1.8 p.p. at the national level.

consequence of its negative impact on sectors producing tradable goods. In effect, the table confirms that the severe contraction in the full-time employment rate in manufactures explains the aggregate behavior. The other two sectors with significant participation in full-time employment (commerce and other services) also showed negative but much smaller figures. More precisely, the contraction in these kinds of jobs in the industrial activities would have explained a reduction of almost 3 p.p. in full-time jobs in the period.[23]

Table 5. Full-time employment rate by productive sector
(% of the total GBA population, by semester)

	1990:1	1992:2	1996:2	1998:1	2000:2	2000:2 – 1990:1 difference
Manufactures	8.54	8.76	6.33	6.69	5.55	-2.99
Construction	1.91	2.30	1.81	2.17	1.89	-0.02
Commerce	6.60	7.17	6.22	6.15	6.55	-0.05
Transp. and com.	2.75	2.43	2.93	3.00	3.05	0.30
Financial services	2.38	2.59	3.33	3.66	3.74	1.36
Other services	7.95	7.70	6.56	7.62	7.49	-0.46
Total	30.13	30.95	27.18	29.29	28.27	-1.86

However, the fall in the FTEMPL ratio for the entire sample was lower than that in manufactures, amounting to 1.86 p.p.. Hence, the decline in full-time employment in the tradable sector was partially offset by the observed behavior in non-tradable ones. Most variations were relatively small, but the increase in "financial services" is striking. In this sector and in GBA, full-time jobs rose by 1.36 p.p. between 1990:1 and 2000:2. This is also the only sector in Table 5 showing a sustained increase in participation in full-time employment.

Given the decisive impact of manufactures in the evolution of FTEMPL, we now examine employment in this sector in deeper detail.

3.2 Employment in the industrial sector

Additional information about manufactures can be obtained from the Survey of Industrial Firms published monthly by INDEC. The survey is national and includes about 1300 firms employing more than 10 workers. In Figure 21 we plotted the series of physical industrial output according to the survey, the index of hours worked and the number of employed persons.

We estimated an industrial-employment demand function in the general form:

d log Nind = α d log (YR) + s,

where Nind (industrial occupation) was alternatively defined as number of workers (Npers) or total hours worked (Nhour); YR stands for physical output and two dummies (commented on below) were also included.

The econometric estimations, made using quarterly data, are the following:

---

[23] Moreover, the decline observed in manufactures in the last recession (1998:1 to 2000:2 in the table) surpassed the fall observed in the aggregate. This observation is consistent with the continuity of employment's contractionary adjustment in the industrial sector as will be commented on and tested below.

EQ14) d log Npers = 0.1647 d log YR - 0.01
t-Stat: (3.68) (-7.56)

$R^2 = 0.25$; Adj. $R^2 = 0.23$; Period: 1990:2-2001:1

EQ15) d log Npers = 0.143 d log YR + 0.0072 Dumreac − 0.0062 Dumreces - 0.011
t-Stat: (2.78) (2.725) (-1.779) (-5.11)

$R^2 = 0.407$; Adj. $R^2 = 0.363$; Period: 1990:2-2001:1

EQ16) d log Nhours = 0.551d log YR + 0.0046 Dumreac − 0.001 Dumreces - 0.013
t-Stat: (6.59) (1.09) (-0.15) (-4.08)

$R^2 = 0.64$; Adj. $R^2 = 0.61$; Period: 1990:2-2001:1

EQ17) d log Nhours = 0.584d log YR - 0.0126
t-Stat: (7.68) (-5.76)

$R^2 = 0.69$; Adj. $R^2 = 0.68$; Period: 1990:2-2001:1

The estimations EQ14 and EQ15 show that the number of workers in the industrial sector follows the movements of physical output with an elasticity of 0.14 to 0.16. Equation EQ15 also includes two dummies. Both variables are statistically significant (but Dumreces at 10 per cent probability). Dumreac is zero for all periods except the 1996:4-1998:4 reactivation phase, when its value is one. Dumreces assumes a value of one from 1999:1 to date, a recessive period. Thus, the significance of Dumreac means that industrial employment creation during the expansion that proceeded the Tequila episode was more intense than that explained by the other terms in the equation. The other dummy indicates that this effect vanished during the recession in the late nineties.

Notwithstanding, it is interesting to see that this change in the behavior of industrial employment from 1996 is not confirmed by the estimations that take total hours worked as the dependent variable. EQ16 shows that neither of the dummies is statistically significant. Furthermore, the output-elasticity of hours worked is not only more significant (statistically) but also much higher than the output-elasticity of occupation measured in number of workers (EQ14 and EQ15), as would be observed under labor-hoarding behavior.

Finally, the constant term in equations EQ16 and EQ17 is negative and significant. This means that in the case of manufactures, and contrary to what we have observed at an aggregate level in the preceding chapter, employment's contractionary adjustment to the new conditions in the nineties is not over.

As Figure 21 shows, both the number of workers and the total hours worked by period in the manufactures have been steadily falling since 1997:3, well before the beginning of the last recession. In 2001:1 the total hours worked and the number of workers in this sector were 28 per cent and 32 per cent lower than their 1991:1 levels, respectively.

A final equation in this section is designed to test the labor-hoarding hypothesis in manufactures. It takes the following form:

d log (Nhours/Npers) = α d log (YR) + u.

Thus, the dependent variable is the rate of change of the average hours worked per employed person. The econometric estimation is:

EQ18) d log (Nhours/Npers) = 0.389 d log YR - 0.00178
t-Stat: (5.37)   (-0.93)

$R^2 = 0.54$;   Adj. $R^2 = 0.53$; Period: 1990:2-2001:1

The estimation reveals that the pro-cyclical behavior of average hours per worker in the manufacturing sector (that can also be observed in Figure 21) is statistically significant and the elasticity is close to 0.4. This means that, facing cyclical variations in output, the labor market adjusts firstly through the number of hours worked and only then through changes in the number of workers. This behavior weakens the elasticity of unemployment to output.

3.3 Employment by position in household and gender (EPH-GBA)

Having analyzed the evolution of aggregate employment in manufactures, we now focus on its distribution by worker categories. Table 6 decomposes full-time employment in the industrial sector in the period.

These figures reveal that all categories of workers considered presented a decline between the extremes of the period. However, male and head-of-household workers have been the most affected.

Table 6. Full-time employment rate in manufactures by category of worker
(% of the total GBA population in selected semesters)

	1990:1	1992:2	1996:2	1998:1	2000:2	2000:2 – 1990:1 difference
Head of household	5.07	5.11	3.79	3.89	3.29	-1.78
Secondary worker	3.47	3.65	2.54	2.80	2.26	-1.21
Male	6.54	6.67	4.92	5.28	4.19	-2.35
Female	2.00	2.09	1.41	1.41	1.36	-0.64
Total	8.54	8.76	6.33	6.69	5.55	-2.99

Table 7 presents the same data for the entire sample, including all productive sectors. The decline in the head-of-household full-time jobs in manufactures as a percentage of the total urban population (Table 6) closely resembles the observed fall for the whole sample. The same can be said about the "male" category.

Therefore, the tables clearly show that the contraction in full-time employment between the extremes of the period primarily affected both the male and head-of-household workers, and that these contractions originated mainly in manufactures.

Table 7. Full-time employment rate by category of worker
(% of the total GBA population in selected semesters)

	1990:1	1992:2	1996:2	1998:1	2000:2	2000:2 – 1990:1 difference
Head of household	17.75	17.37	15.44	16.41	15.98	-1.77
Secondary worker	12.38	13.58	11.74	12.88	12.29	-0.09
Male	21.52	21.84	19.12	20.12	19.15	-2.37
Female	8.61	9.11	8.06	9.17	9.12	0.51
Total	30.13	30.95	27.18	29.29	28.27	-1.86

On the other hand, women and secondary workers increased their participation in full-time employment in other (non-industrial) productive sectors. Given this, their aggregate full-time employment rates either remained stable (secondary workers) or increased (women) between 1990 and 2000.

Figures 22 and 23 and Tables 8 and 9 present more detailed information for GBA, including the figures on both voluntary and involuntary underemployment.

A comparison of Figures 22 and 23 shows that both the male and head-of-household categories behaved like "full-time jobs" during the first cycle in the nineties. On the other hand, female and secondary workers followed trajectories that closely resemble that of the rate of employment (that includes not only the voluntarily underemployed but also the involuntarily so).

The second cycle in the nineties shows several differences. Even if the male-worker curve and "full-time employment" are comparable, their shape now differs from head of household. This category shows a stronger recovery in 1998-99. On the other hand, "female" tended to behave more like "head of household" than before.

Tables 8 and 9 present more detailed data, including the cross-entries by category of worker and productive sector.

Table 8 presents levels (in percentages of the total population) and Table 9 shows variations (of the same rates) between periods.

Let us begin with the accumulated variations between 1990:1 and 2000:2 (last part of Table 9).

The first column in this part of the Table shows the variations in the different employment and underemployment rates. It also presents the decomposition of these variations in percentages by productive sector (adding up to 100 per cent). The decomposition of every variation by gender and position in household should be read horizontally and adds also up to 100 per cent.

The total-employment ratio to population (left-upper cell) rose by 1.09 p.p. in the period. However, this increase involved a rise of 3.33 p.p. in involuntary underemployment, together with falls in full-time employment (-1.86 p.p.) and voluntary underemployment (-0.40 p.p.).

The decomposition of employment variation by category is striking. Female and secondary workers explain the 1.09 p.p. increase in the employment rate (with contributions of 191 per cent and 121 per cent, respectively), while both male and head-of-household categories present negative contributions.

As we have already seen, manufactures explain the contraction in full-time jobs (partially offset by the behavior of financial services and transport and communications). In this sector, male and head-of-household workers account for most of the decline.

In contrast, both female and secondary workers explain most of the increase in involuntary underemployment to which the "other services" sector contributed with about a half of the variation.

Table 9 also helps to describe the evolution of employment by category and sector during the different phases in the nineties.

In the initial expansionary period (1990:1-1992:2) total employment grew by 1.5 p.p.. Both the full-time employment and the voluntary-underemployment rates moved upwards (0.82 p.p. and 1.16 p.p., respectively) while involuntary underemployment declined counter-cyclically (-0.48 p.p.). Most of the employment creation originated in the commercial sector, followed by construction and manufactures. Despite the economic expansion, the employment rate of head-of-household workers showed a decline, which was even more intense for full-time jobs.

In the subsequent contractionary phase (1992:2-1996:2) total employment fell by 2.4 p.p.. The fall was partially offset by an increase (+3.35 p.p.) in involuntary underemployment. The full-time job ratio dropped (-3.77 p.p.) as did the voluntary-underemployment rate (-1.97 p.p.). Two thirds of the contraction in full-time jobs is explained by manufactures, and concentrated mainly in the male and head-of-household categories. Notwithstanding the recession, "financial services" showed an increase in full-time jobs, as did "transport and communications."

Unlike full-time employment, the fall in voluntary underemployment mainly affected women and secondary workers. Moreover, half of this contraction is explained by "other services."

On the other hand, "other services" (and principally female and secondary workers in this sector) also accounts for a significant part of the increase in involuntary underemployment in this phase.

From 1996:2 to 1998:1 a new expansionary phase took place. In this period the rate of aggregate employment to population increased by 2.7 p.p., with a more balanced participation of the different categories of workers.

The full-time employment ratio rose by 2.11 p.p., with half of the increase registered in "other services." This sector also led the growth of voluntary underemployment with an important role of female and head-of-household workers.

Typically, involuntary underemployment showed a counter-cyclical behavior with a decline of 0.11 p.p..

Finally, the economy underwent a new contractionary period from 1998:1. From then to 2000:2, aggregate employment fell by 0.7 p.p., explained entirely by male workers, and almost equally distributed between head-of-household and secondary employees.

Nonetheless, full-time employment suffered from a steeper decline of 1.2 p.p., also concentrated in male workers and, considering the activity sectors, in manufactures. The strikingly negative performance of the industrial sector was partially compensated for by commerce (and to a lower degree by both transport and communications and financial services) that acted counter-cyclically, increasing their participation in full-time jobs (as well as in the voluntary-underemployment rate).

Table 8. Employment, full-time employment and underemployment rates, measured in percentage points of the total GBA population

| | 1990:1 | | | | | 1992:2 | | | | |
	Total	Male	Female	Head of H.	Sec. work.	Total	Male	Female	Head of H.	Sec. work.
Total Employment	**37.41**	**24.14**	**13.27**	**19.99**	**17.42**	**38.91**	**24.77**	**14.14**	**19.87**	**19.04**
Full-time employment (1)	**30.13**	**21.52**	**8.61**	**17.75**	**12.38**	**30.95**	**21.84**	**9.11**	**17.37**	**13.58**
Manufactures	8.54	6.54	2.00	5.07	3.47	8.76	6.67	2.09	5.11	3.65
Construction	1.91	1.87	0.04	1.32	0.59	2.30	2.22	0.08	1.58	0.72
Commerce	6.60	4.76	1.84	3.78	2.82	7.17	4.82	2.35	3.69	3.48
Transport and Communications	2.75	2.49	0.26	2.06	0.69	2.43	2.22	0.21	1.68	0.75
Financial Services	2.38	1.74	0.64	1.50	0.88	2.59	1.82	0.77	1.56	1.03
Other Services	7.95	4.12	3.83	4.02	3.93	7.70	4.09	3.61	3.75	3.95
Voluntary underemployment (2)	**3.70**	**1.09**	**2.61**	**0.90**	**2.80**	**4.86**	**1.60**	**3.26**	**1.29**	**3.57**
Manufactures	0.37	0.21	0.16	0.12	0.25	0.67	0.37	0.30	0.25	0.42
Construction	0.08	0.08	0.00	0.05	0.03	0.16	0.13	0.03	0.07	0.09
Commerce	0.50	0.21	0.29	0.15	0.35	0.80	0.31	0.49	0.17	0.63
Transport and Communications	0.09	0.05	0.04	0.03	0.06	0.11	0.08	0.03	0.04	0.07
Financial Services	0.26	0.08	0.18	0.08	0.18	0.48	0.24	0.24	0.16	0.32
Other Services	2.40	0.46	1.94	0.47	1.93	2.64	0.47	2.17	0.60	2.04
(1) + (2)	**33.83**	**22.61**	**11.22**	**18.65**	**15.18**	**35.81**	**23.44**	**12.37**	**18.66**	**17.15**
Manufactures	8.91	6.75	2.16	5.19	3.72	9.43	7.04	2.39	5.36	4.07
Construction	1.99	1.95	0.04	1.37	0.62	2.46	2.35	0.11	1.65	0.81
Commerce	7.10	4.97	2.13	3.93	3.17	7.97	5.13	2.84	3.86	4.11
Transport and Communications	2.84	2.54	0.30	2.09	0.75	2.54	2.30	0.24	1.72	0.82
Financial Services	2.64	1.82	0.82	1.58	1.06	3.07	2.06	1.01	1.72	1.35
Other Services	10.35	4.58	5.77	4.49	5.86	10.34	4.56	5.78	4.35	5.99
Involuntary underemployment	**3.58**	**1.53**	**2.05**	**1.34**	**2.24**	**3.10**	**1.33**	**1.77**	**1.21**	**1.89**
Manufactures	0.45	0.19	0.26	0.17	0.28	0.33	0.20	0.13	0.22	0.11
Construction	0.33	0.30	0.03	0.22	0.11	0.21	0.20	0.01	0.12	0.09
Commerce	0.57	0.35	0.22	0.29	0.28	0.25	0.16	0.09	0.10	0.15
Transport and Communications	0.14	0.14	0.00	0.08	0.06	0.21	0.18	0.03	0.13	0.08
Financial Services	0.09	0.03	0.06	0.03	0.06	0.22	0.11	0.11	0.08	0.14
Other Services	2.00	0.52	1.48	0.55	1.45	1.88	0.48	1.40	0.56	1.32
Rate of activity	40.90					41.70				
Rate of unemployment	3.49					2.87				

	1996:2 Total	Male	Female	Head of H.	Sec. work.	1998:1 Total	Male	Female	Head of H.	Sec. work.	2000:2 Total	Male	Female	Head of H.	Sec. work.
Total Employment	**36.50**	**22.65**	**13.85**	**18.69**	**17.81**	**39.20**	**23.86**	**15.34**	**20.12**	**19.08**	**38.50**	**23.15**	**15.35**	**19.76**	**18.74**
Full-time employment (1)	**27.18**	**19.12**	**8.06**	**15.44**	**11.74**	**29.29**	**20.12**	**9.17**	**16.41**	**12.88**	**28.27**	**19.15**	**9.12**	**15.98**	**12.29**
Manufactures	6.33	4.92	1.41	3.79	2.54	6.69	5.28	1.41	3.89	2.80	5.55	4.19	1.36	3.29	2.26
Construction	1.81	1.76	0.05	1.25	0.56	2.17	2.15	0.02	1.50	0.67	1.89	1.81	0.08	1.30	0.59
Commerce	6.22	4.12	2.10	3.02	3.20	6.15	3.83	2.32	2.99	3.16	6.55	4.25	2.30	3.12	3.43
Transport and Communications	2.93	2.71	0.22	2.02	0.91	3.00	2.68	0.32	2.09	0.91	3.05	2.67	0.38	2.04	1.01
Financial Services	3.33	2.11	1.22	2.01	1.32	3.66	2.31	1.35	2.04	1.62	3.74	2.53	1.21	2.21	1.53
Other Services	6.56	3.50	3.06	3.35	3.21	7.62	3.87	3.75	3.90	3.72	7.49	3.70	3.79	4.02	3.47
Voluntary underemployment (2)	**2.89**	**0.84**	**2.05**	**0.62**	**2.27**	**3.59**	**1.18**	**2.41**	**1.04**	**2.55**	**3.30**	**0.92**	**2.38**	**0.89**	**2.41**
Manufactures	0.38	0.14	0.24	0.09	0.29	0.47	0.22	0.25	0.10	0.37	0.29	0.13	0.16	0.07	0.22
Construction	0.05	0.05	0.00	0.04	0.01	0.07	0.06	0.01	0.03	0.04	0.09	0.09	0.00	0.06	0.03
Commerce	0.48	0.23	0.25	0.11	0.37	0.54	0.22	0.32	0.13	0.41	0.67	0.25	0.42	0.18	0.49
Transport and Communications	0.09	0.04	0.05	0.03	0.06	0.11	0.08	0.03	0.07	0.04	0.16	0.09	0.07	0.05	0.11
Financial Services	0.28	0.05	0.23	0.06	0.22	0.30	0.10	0.20	0.10	0.20	0.25	0.10	0.15	0.12	0.13
Other Services	1.61	0.33	1.28	0.29	1.32	2.10	0.50	1.60	0.61	1.49	1.84	0.26	1.58	0.41	1.43
(1) + (2)	**30.05**	**19.95**	**10.10**	**16.06**	**13.99**	**32.87**	**21.30**	**11.57**	**17.44**	**15.43**	**31.58**	**20.06**	**11.52**	**16.86**	**14.72**
Manufactures	6.70	5.05	1.65	3.88	2.82	7.16	5.50	1.66	3.99	3.17	5.85	4.32	1.53	3.36	2.49
Construction	1.86	1.81	0.05	1.29	0.57	2.24	2.21	0.03	1.54	0.70	1.98	1.90	0.08	1.36	0.62
Commerce	6.69	4.35	2.34	3.12	3.57	6.69	4.05	2.64	3.12	3.57	7.23	4.50	2.73	3.30	3.93
Transport and Communications	3.02	2.75	0.27	2.05	0.97	3.10	2.76	0.34	2.15	0.95	3.20	2.75	0.45	2.08	1.12
Financial Services	3.61	2.16	1.45	2.07	1.54	3.96	2.41	1.55	2.13	1.83	3.99	2.63	1.36	2.33	1.66
Other Services	8.17	3.83	4.34	3.65	4.52	9.72	4.37	5.35	4.51	5.21	9.33	3.96	5.37	4.43	4.90
Involuntary underemployment	**6.45**	**2.69**	**3.76**	**2.63**	**3.82**	**6.34**	**2.57**	**3.77**	**2.69**	**3.65**	**6.91**	**3.08**	**3.83**	**2.89**	**4.02**
Manufactures	0.77	0.38	0.39	0.34	0.43	0.57	0.25	0.32	0.27	0.30	0.79	0.44	0.35	0.36	0.43
Construction	0.66	0.64	0.02	0.48	0.18	0.68	0.67	0.01	0.49	0.19	0.80	0.79	0.01	0.53	0.27
Commerce	0.81	0.53	0.28	0.35	0.46	0.80	0.40	0.40	0.29	0.51	0.95	0.45	0.50	0.31	0.64
Transport and Communications	0.23	0.19	0.04	0.14	0.09	0.33	0.26	0.07	0.22	0.11	0.30	0.27	0.03	0.16	0.14
Financial Services	0.44	0.20	0.24	0.17	0.27	0.32	0.12	0.20	0.16	0.16	0.44	0.20	0.24	0.17	0.27
Other Services	3.54	0.75	2.79	1.15	2.39	3.64	0.87	2.77	1.26	2.38	3.63	0.93	2.70	1.36	2.27
Rate of activity	44.90					45.60					45.10				
Rate of unemployment	8.48					6.51				6.51	6.74				

Table 9. Variation in employment, full-time employment and underemployment rates (in percentage points of the total GBA population; decompositions by sector or worker category are expressed as percentages of the variation of the corresponding rate)

	Increment 1990:1 - 1992:2					Increment 1992:2 - 1996:2				
	Total	Male	Female	Head of H.	Sec. work.	Total	Male	Female	Head of H.	Sec. work.
Total Employment	**1.50**	**42 %**	**58%**	**-8%**	**108%**	**-2.41**	**88%**	**12%**	**49%**	**51%**
Full-time employment (1)	**0.82**	**39%**	**61%**	**-46%**	**146%**	**-3.77**	**72%**	**28%**	**51%**	**49%**
Manufactures	27%	59%	41%	18%	82%	64%	72%	28%	54%	46%
Construction	48%	90%	10%	67%	33%	13%	94%	6%	67%	33%
Commerce	70%	11%	89%	-16%	116%	25%	74%	26%	71%	29%
Transport and Communications	-39%	84%	16%	119%	-19%	-13%	98%	2%	68%	32%
Financial Services	26%	38%	62%	29%	71%	-20%	39%	61%	61%	39%
Other Services	-30%	12%	88%	108%	-8%	30%	52%	48%	35%	65%
Voluntary underemployment (2)	**1.16**	**44%**	**56%**	**34%**	**67%**	**-1.97**	**39%**	**61%**	**34%**	**66%**
Manufactures	26%	53%	47%	43%	57%	15%	79%	21%	55%	45%
Construction	7%	63%	38%	25%	75%	6%	73%	27%	27%	73%
Commerce	26%	33%	67%	7%	93%	16%	25%	75%	19%	81%
Transport and Communications	2%	150%	-50%	50%	50%	1%	200%	-100%	50%	50%
Financial Services	19%	74%	26%	37%	65%	10%	97%	3%	51%	51%
Other Services	21%	4%	96%	54%	46%	52%	14%	86%	30%	70%
(1) + (2)	**1.98**	**42%**	**58%**	**1%**	**100%**	**-5.74**	**61%**	**39%**	**45%**	**55%**
Manufactures	26%	56%	44%	33%	67%	47%	73%	27%	54%	46%
Construction	24%	85%	15%	60%	40%	10%	90%	10%	60%	40%
Commerce	44%	18%	82%	-8%	108%	22%	61%	39%	58%	42%
Transport and Communications	-15%	80%	20%	123%	-23%	-8%	94%	6%	69%	31%
Financial Services	22%	56%	44%	33%	68%	-9%	18%	82%	64%	35%
Other Services	-1%	200%	-100%	1400%	-1300%	38%	34%	66%	32%	68%
Involuntary underemployment	**-0.48**	**42%**	**58%**	**27%**	**73%**	**3.35**	**41%**	**59%**	**42%**	**58%**
Manufactures	25%	-8%	108%	-42%	142%	13%	41%	59%	27%	73%
Construction	25%	83%	17%	83%	17%	13%	98%	2%	80%	20%
Commerce	67%	59%	41%	59%	41%	17%	66%	34%	45%	55%
Transport and Communications	-15%	57%	43%	71%	29%	1%	50%	50%	50%	50%
Financial Services	-27%	62%	38%	38%	62%	7%	41%	59%	41%	59%
Other Services	25%	33%	67%	-8%	108%	50%	16%	84%	36%	64%

	Increment 1996:2 - 1998:1					Increment 1998:1 - 2000:2				
	Total	Male	Female	Head of H.	Sec. work.	Total	Male	Female	Head of H.	Sec. work.
Total Employment	**2.70**	**45%**	**55%**	**53%**	**47%**	**-0.70**	**101%**	**-1%**	**51%**	**49%**
Full-time employment (1)	**2.11**	**47%**	**53%**	**46%**	**54%**	**-1.02**	**95%**	**5%**	**42%**	**58%**
Manufactures	17%	100%	0%	28%	72%	112%	96%	4%	53%	47%
Construction	17%	108%	-8%	69%	31%	27%	121%	-21%	71%	29%
Commerce	-3%	414%	-314%	43%	57%	-39%	105%	-5%	32%	67%
Transport and Communications	3%	-43%	143%	100%	0%	-5%	-20%	120%	-100%	200%
Financial Services	16%	61%	39%	9%	91%	-8%	275%	-175%	212%	-113%
Other Services	50%	35%	65%	52%	48%	13%	131%	-31%	-92%	192%
Voluntary underemployment (2)	**0.70**	**49%**	**51%**	**60%**	**40%**	**-0.29**	**90%**	**10%**	**52%**	**48%**
Manufactures	13%	89%	11%	11%	89%	62%	50%	50%	17%	83%
Construction	3%	50%	50%	-50%	150%	-7%	150%	-50%	150%	-50%
Commerce	9%	-17%	117%	33%	67%	-45%	23%	77%	38%	62%
Transport and Communications	3%	200%	-100%	200%	-100%	-17%	20%	80%	-40%	140%
Financial Services	3%	250%	-150%	200%	-100%	17%	0%	100%	-40%	140%
Other Services	70%	35%	65%	65%	35%	90%	92%	8%	77%	23%
(1) + (2)	**2.82**	**48%**	**52%**	**49%**	**51%**	**-1.29**	**96%**	**4%**	**45%**	**55%**
Manufactures	16%	98%	2%	24%	76%	102%	90%	10%	48%	52%
Construction	13%	105%	-5%	66%	34%	20%	119%	-19%	69%	31%
Commerce	0%					-42%	83%	17%	33%	67%
Transport and Communications	3%	12%	88%	125%	-25%	-8%	-10%	110%	-70%	170%
Financial Services	12%	71%	29%	17%	83%	-2%	733%	-633%	667%	-567%
Other Services	55%	35%	65%	55%	45%	30%	105%	-5%	21%	79%
Involuntary underemployment	**-0.11**	**109%**	**-9%**	**-55%**	**155%**	**0.57**	**89%**	**11%**	**35%**	**65%**
Manufactures	182%	65%	35%	35%	65%	39%	86%	14%	41%	59%
Construction	-18%	150%	-50%	50%	50%	21%	100%	0%	33%	67%
Commerce	9%	1300%	-1200%	600%	-500%	26%	33%	67%	13%	87%
Transport and Communications	-91%	70%	30%	80%	20%	-5%	-33%	133%	200%	-100%
Financial Services	109%	67%	33%	8%	92%	21%	67%	33%	8%	92%
Other Services	-91%	120%	-20%	110%	-10%	-2%	-600%	700%	-1000%	1100%

Table 9 (cont.)

	Increment 1990:1 - 2000:2				
	Total	**Male**	**Female**	**Head of H.**	**Sec. work.**
Total Employment	**1.09**	**-91%**	**191%**	**-21%**	**121%**
Full-time employment (1)	**-1.86**	**127%**	**-27%**	**95%**	**5%**
Manufactures	161%	79%	21%	60%	40%
Construction	1%	300%	-200%	100%	0%
Commerce	3%	1020%	-920%	1320%	-1220%
Transport and Communications	-16%	60%	40%	-7%	107%
Financial Services	-73%	58%	42%	52%	48%
Other Services	25%	91%	9%	0%	100%
Voluntary underemployment (2)	**-0.40**	**43%**	**58%**	**3%**	**98%**
Manufactures	20%	100%	0%	63%	38%
Construction	-3%	100%	0%	100%	0%
Commerce	-43%	24%	76%	18%	82%
Transport and Communications	-18%	57%	43%	29%	71%
Financial Services	3%	-200%	300%	-400%	500%
Other Services	140%	36%	64%	11%	89%
(1) + (2)	**-2.25**	**113%**	**-13%**	**80%**	**20%**
Manufactures	136%	79%	21%	60%	40%
Construction	0%	500%	-400%	100%	0%
Commerce	-6%	-362%	462%	-485%	585%
Transport and Communications	-16%	58%	42%	-3%	103%
Financial Services	-60%	60%	40%	56%	44%
Other Services	45%	61%	39%	6%	94%
Involuntary underemployment	3.33%	47%	53%	47%	53%
Manufactures	10%	74%	26%	56%	44%
Construction	14%	104%	-4%	66%	34%
Commerce	11%	26%	74%	5%	95%
Transport and Communications	5%	81%	19%	50%	50%
Financial Services	11%	49%	51%	40%	60%
Other Services	49%	25%	75%	50%	50%

4. The evolution of the average incomes of the employed workers and the active population

The observed changes in the structure of the labor market that we have just commented on, with the impressive rise in unemployment among them, necessarily impacted on the generation and distribution of incomes.

We will focus here on the evolution of average incomes under the convertibility regime. We consider both labor incomes and the returns on assets, excluding social security transfers. The information analyzed in this section is based on the permanent household survey (EPH) and refers to GBA.

Figure 24 depicts the evolution of average real incomes for both the employed workers and the active population in the nineties. Income series in real terms are always obtained as a quotient between the corresponding nominal series and the Consumer Price Index.

The series follow a pro-cyclical pattern. In the expansionary phase in the early nineties the income of the employed workers grew by 22 per cent (to peak in 1994:1) while that of the active population rose by 19 per cent. From then, both series decline to a minimum in 1996:2. A second cycle begins with a new expansionary phase that ends in 1998:2. However, neither of the series matches the preceding peak.

The income level at the end of 2000 surpassed the initial one by 8.8 per cent for the employed and by only 1 per cent for the active workers, but ranked below the 1994:1 peak in 10.6 per cent and 15.2 per cent, respectively.

The growing gap between both series reflects the impact of the increase in GBA's unemployment rate from 1993, and especially from 1995:1 (see Figure 26) when the income of the active population shows a sharp decline. However, a falling unemployment rate between late 1996 and 1998 helps explain a smaller gap. Be it as it may, while the ratio of active to occupied workers' average income was 93 per cent at the beginning of the period, it fell to 86 per cent by the end of the decade.

The unemployment effect can be quantified expressing the active workers' rate of increase in income as a function of the employed workers' rate of increase in income and the change in the unemployment rate:

$$(\Delta YA)/YA \approx (\Delta YN)/YN - \Delta(UN/A)\ (YN/YA),$$
$$1\% \quad \approx \quad 8.8\% - \quad 9.0\%$$

where YA stands for the active population's real income, YN is the employed workers' income, UN is the number of unemployed people and A is the number of active people, so that UN/A is the unemployment rate.

The first term on the right side of the equation reflects the rate of increase of the active population's average income that would have been experienced had the unemployment rate remained constant. The second term measures the rate of increase of the active population's average income had the employed workers' average income remained unchanged.[24]

The figures below the equation correspond to the observed variations between the extremes of the period. They evidence the strong impact of the evolution of

---

[24] The decomposition is not exact due to the existence of crossed effects.

unemployment: Had the average incomes of the employed workers remained constant, the active workers would have had theirs reduced by about 9 per cent. In contrast, with a constant unemployment rate, such income would have risen by more than 8 per cent.

It is worth mentioning that, broadly speaking and beyond differences in accounting methods, these figures are compatible with those provided by the National Accounting System. We should also mention that the income series discussed here were obtained from the GBA and not for the whole country.

At the national level, GDP at constant prices rose by about 38.7 per cent in the period 1991:1-2000:2. It can be estimated that, in the same period, the urban population may have increased by about 20 per cent, assuming a yearly rate of growth of 2 per cent.[25] Furthermore, participation rates jumped from 39.5 per cent to 42.7 per cent. Thus, the total number of active individuals may have risen by more than 30 per cent, approaching the observed increase in real GDP.

Additionally, the data in Figure 24 refer to income, not to output, and income transfers abroad (a concept that has to be subtracted from output when measuring aggregate income) rose in the period, as a percentage of GDP. Another factor to be considered is that incomes in Figure 24 were deflated by CPI, whose variation certainly surpassed that of the GDP deflator. However, we cannot strictly compare both indexes because pre-1993 data regarding the GDP deflator are unavailable. Considering these factors, the apparent compatibility between incomes' rates of change according to both sources (EPH and the National Accounting System) seems to strengthen.[26]

In contrast with the increase in participation rates, the employment rate of the urban population was somewhat similar at the extremes of the period (36.5 per cent in 2000:2 against 36.8 per cent in 1991:1). Therefore, the number of employed workers may have grown by about 8 per cent less than the active ones. This explains an average income increase that is about 8 per cent higher for the former group in 2000:2, as Figure 24 shows.

The resulting end-of-period panorama can be characterized by an average income of the employed workers that was less that 10 per cent higher than observed at the beginning of the nineties. Meanwhile, the jump in participation rates means that the active individuals' average income happened to be practically the same at the extremes of the period. Inasmuch as the employed population grew at a pace roughly similar to the total population (as revealed by the employment rate), per capita income experienced a similar increase to employed workers' average income.

---

[25] This rate could not be confirmed because the 2000 Population Census was postponed to late 2001 and the figures regarding urban population were still unavailable at the moment this text was written. It is consistent with the pre-1990 evidence, when urban population growth was slightly higher than the total population's.

[26] It should be stressed that we are presenting a rough comparison between "variations" in incomes and product coming form different sources. We do not intend to compare "levels" here.

5. Income distribution

Having examined the evolution of the average income of both the employed workers and the active population, we now focus on the question of how the observed changes were distributed within these groups. To that purpose, we first examine the behavior of inequality among households. Then, we explore the cases of the active population, on the one hand, and the employed workers, on the other.

The analysis is based on the estimation of Gini and Theil indexes. If these indicators generally show similar income distribution trends, differences may arise as a consequence of the dissimilar weights that they attribute to the transfers between individuals in different positions in the distribution.[27] Furthermore, the Theil index has the advantage of allowing for an additive decomposition between an intra and an inter-group component, as we will see below.

The analysis of the evolution of per capita household income provides the most appropriate perspective to the study of the distribution of total incomes. In effect, an examination of households, rather than individuals, offers a more exact picture of the welfare levels enjoyed by the population.

The analysis of income-distribution inequality focusing on households involves several determinants like the differences in unemployment incidence among household groups, as well as those observed regarding participation rates, hours worked and returns obtained by the individuals.

Therefore, we begin this section by considering the evolution of the Gini index of per capita household income. As Figure 25 shows, we can identify two neat phases in the evolution of this index in the nineties. The inequality in the distribution of per capita household income fluctuated around a stable trend until 1994. While the Gini index was 0.44 in the first semester of 1991, it was slightly lower in the first semester of 1994, reaching a value of 0.4324. From then, it experienced a growing trend to conclude the period with a value of 0.481. This implied an increment of about 10 per cent from the beginning of the decade.

To obtain a better description of income transfers between different population groups we present Table 10. It shows the evolution of income distribution among households by deciles defined according to per capita household income. The figures refer to the years 1991, 1994, 1998, and 2000.

A slight improvement in income distribution among households can be observed between 1991 and 1994. While 50 per cent of the household with the smallest per capita incomes concentrated 19.34 per cent of the total incomes in 1991, in 1994 this participation rose to 19.8 per cent. For 80 per cent of the households with the lowest incomes these percentages were 47.7 and 48.7, respectively. The counterpart was a small contraction in the participation of the 10 per cent wealthiest households between both years. This redistribution favored all the other groups. The quotient of the incomes of the 10 and the 1 deciles declined from 23.6 to 22.5.

The table also shows that, in contrast, income distribution among households worsened considerably from 1994. A strong income concentration process took place favoring exclusively the wealthiest decile. This group concentrated 40.3 per cent of the

---

[27] The Theil index attributes a larger weight to the transfers that involve the richest individuals while the Gini index does the same with the observations in the central part of the distribution.

total incomes in 2000, five percentage points above its initial participation. The quotient of the total incomes of this group and the first decile jumped to 38 times.

Several factors explain this worsening in income distribution by household groups. The rise in the unemployment rate stands out, which had a stronger impact on the poorest households. Additionally, we have to account for a growing inequality among the employed workers. Given this (and taking into account that we are not considering the incomes from social security transfers), it clearly follows that the increase in inequality among the active population (affected by both the higher unemployment rate and the stronger inequality among the employed) surpassed the rise observed in the case of households, as a comparison between Tables 10 and 11 would confirm.

In effect, income distribution among the active population began to deteriorate from the beginning of the decade, with a strong worsening from 1994. While 50 per cent of the active individuals of smallest income received 20.2 per cent of the total incomes in 1991, its participation fell to 15.9 per cent in the year 2000. In contrast, the participation of the decile of the highest income jumped from 35 per cent in 1991 to almost 40 per cent at the end of the period.

The observed redistribution in favor of the highest income decile took place fundamentally between 1994 and 1998. In this period the unemployment rate reached its uppermost values in the decade. It can be seen that the first decile of the active population had no income in 1998 and 2000. This is so because the unemployment rate was then largely above 10 per cent, and when a person becomes unemployed she constitutes an observation in the sample with null income. However, the first decile still perceived a positive income in the same years in the case of households.

Table 10
Income distribution among households
(by deciles according to per capita household income)

Deciles	Percentage of total accumulated income			
	1991:1	1994:1	1998:1	2000:2
1	1.50	1.55	1.21	1.06
2	4.35	4.61	3.76	3.44
3	8.31	8.60	7.24	6.90
4	13.43	13.62	11.66	11.36
5	19.34	19.84	17.18	16.94
6	26.56	27.41	24.23	23.93
7	35.76	36.68	33.27	32.91
8	47.73	48.70	45.14	44.84
9	64.66	65.09	62.00	59.71
10	100.00	100.00	100.00	100.00
Gini coefficient	0.440	0.432	0.473	0.481
10 decile/1 decile	23.6	22.5	31.4	38.0

Table 11
Income distribution by deciles of the active population

Deciles	Percentage of total accumulated income			
	1991:1	1994:1	1998:1	2000:2
1	0.47	0.07	0.00	0.00
2	3.61	2.65	1.62	1.25
3	8.23	6.97	5.31	4.65
4	13.61	12.41	10.39	9.64
5	20.21	19.08	16.70	15.92
6	27.88	26.95	24.39	23.61
7	37.34	36.39	33.73	33.08
8	49.20	48.28	45.59	44.57
9	65.15	64.18	61.97	60.10
10	100.00	100.00	100.00	100.00
Gini coefficient	0.451	0.473	0.501	0.506

For a closer look at the effect of unemployment on income distribution inequality we also present the evolution of the unemployment rate (for GBA, measured in terms of the active population) during the decade. As Figure 26 shows, this indicator evidences a short initial phase of stability between 1991 and the second semester of 1992. From then, an upward jump can be seen until the first semester of 1995, when the maximum for the entire period is reached. At that moment GBA's unemployment rate peaked at 20 per cent of the active population.

From 1995:2 this indicator began to diminish to a relative minimum in the second semester of 1998, with a value of 13 per cent of the active population, still well above the values observed before 1993. From 1999 the series resumes an upward trend that finishes the period at 14.7 per cent of the active population.

Figure 26 also presents the Gini index for the active population of the GBA. A high correlation can be seen between both series. However, in the period with a falling unemployment rate (1995 to 1998) both variables moved differently. Unlike the decline in the unemployment figures, the Gini index still increased owing to the rise in inequality among the employed workers, as we will next show.

Between 1991 and 1994 income distribution among the employed workers remained practically unchanged, as measured by Gini indexes. Fifty percent with the lowest incomes in this group received 22.8 per cent of the total incomes in 1991 and 22.9 per cent in 1994. On the other hand, the decile of the highest income obtained 33.2 per cent and 33.4 per cent, respectively, equivalent to about 16 times the incomes of the first decile.

It is interesting to observe that a redistribution of income took place from the first, second, and last deciles in favor of the groups at the center of the distribution. In contrast, a strong process of income concentration starting in 1994 favored exclusively the highest income decile. Their participation increased to 34.7 per cent in 2000:2, while that of the 50 per cent employed workers with the lowest incomes fell to 20.7 per cent. These changes took place fundamentally between 1994 and 1998.

Table 12
Income distribution by deciles of the employed population

Deciles	Percentage of total accumulated income			
	1991:1	1994:1	1998:1	2000:2
1	2.10	2.06	1.71	1.41
2	5.90	5.82	5.09	4.59
3	10.60	10.60	9.56	8.93
4	16.15	16.27	14.91	14.30
5	22.79	22.88	21.28	20.75
6	30.24	30.62	28.87	28.35
7	39.57	39.99	38.13	37.46
8	51.16	51.48	49.49	49.09
9	66.77	66.96	65.08	65.31
10	100.00	100.00	100.00	100.00
Gini coefficient	0.424	0.423	0.449	0.452
10 decile/1decile	15.8	16.0	20.4	24.6

The only decile to show an increase in its participation in total income between the extremes of the period was the one with the highest income. The rest experienced decreases in their participation.

The changes in income distribution within both the active population and employed workers can also be illustrated by the Gini and Theil indexes obtained for both groups over the period 1991:1-2000:2. We present them in Figures 27, 28, 29, and 30.

A neat correlation exists between both indexes. Employed workers' indexes fluctuate around a stable trend until 1994, and rise thereinafter. They reach values of 0.424 (Gini) and 0.311 (Theil) in 1991:1 and values of 0.452 (Gini) and 0.383 (Theil) in 2000:2, implying increments of 6.7 per cent and 23 per cent over its 1991:1 levels, respectively.

A similar panorama results in the case of the active population, but with a steeper upward jump in the income inequality indexes from 1994. In 1991:1 the Gini and Theil indexes were 0.451 and 0.331, respectively. These values climbed to 0.506 and 0.427 in 2000:1. Thus, the gap between the indexes referring to employed workers and active people widens from 1994:2, as shown in Figures 29 and 30.

The inequality indexes show positive and highly significant trends throughout the period. While the employed workers' Gini index increases by approximately 1 per cent per year, the active populations' index rises at an annual rate of 1.7 per cent.

In synthesis, until 1994 income distribution among the employed workers remained practically unaffected, however a deterioration in the case of the active population was observed. The sharp increase in the unemployment rate explains this phenomenon. From then, the fact that income concentration was strongest for the active population is due to the combined effect of the rise in the unemployment rates and the increment in inequality among the employed, as Table 12 shows.[28]

In the preceding chapter we observed that the average real income of the employed workers increased by about 9 per cent in the period under consideration. However, the income-distribution inequality within this population group also rose, as evidenced by the different inequality indicators we have just presented. In other words, the rise in average

---

[28] The latter effect, in turn, can be considered mainly a consequence of the differences in the unemployment-elasticity of wages (or incomes) for different groups of workers. These elasticities are higher for lower-income population groups, as will be shown below.

incomes was not homogeneous among different groups of workers. Therefore, in the following two sections we will focus on income distribution among different groups of employed workers in the nineties.[29,30]

6. Income and structure effects and the evolution of the average income

In this section we examine the evolution of income distribution among the employed considering different characteristics of workers and jobs: type of occupation, gender and educational level. The observed changes in the average income of employed workers are due to either the variations in the average income of different groups (income effect) or to changes in the relative participation each group has in total occupation (structure effect), or both.

To estimate the separate impact of both changes in employment structure and variations in incomes of different groups of workers on the change on average real income we decompose this variable in the following way:

$$(\Delta WE)/WE = \underbrace{\left[\sum_i \left(\Delta(W_i) x \frac{E_i}{E} \right) \right]/WE}_{INCOME\,EFFECT} + \underbrace{\left[\sum_i \left(\Delta\left(\frac{E_i}{E}\right) x W_i \right) \right]/WE}_{STRUCTURE\,EFFECT}$$

where WE is the average real income of the employed, W_i stands for the average income of group "i", E is the number of people with a job and E_i stands for the number of employed people in group "i".

The expression in the left-hand brackets represents the effect of changes in average incomes, keeping the initial structure of employment constant. The brackets on the right represent the impact of the changes in the employment structure with the initial incomes of every group constant.

The period under analysis goes from 1991:1 to 2000:2 and the data refer to GBA.

6.1 Employment and income by type of occupation

We begin the analysis by focusing on the different types of occupation. In Figures 31 and 32 we present the evolution of employment and incomes considering the distribution of jobs between full-time wage earners, full-time non-wage earners, and involuntarily underemployed workers.

As was already described, the ratio of full-time jobs to total jobs tended to fall in the nineties. The fall amounted to 10 p.p.. This trend was particularly sharp for full-time wage earners (-6 p.p.). Unlike these groups, the involuntarily underemployed gained participation.

---

[29] Beyond the increment in inequality, an increasing polarization of the population in two groups which are internally homogeneous but strongly different in average income has been found for recent years. For further detail, see Beccaria, Esquivel and Maurizio (2001).
[30] For an analysis of the evolution of distributive inequality in Argentina from the seventies see Altimir and Beccaria (2000).

On the other hand, as Figure 32 shows, the involuntarily underemployed suffered an important fall (15 per cent) in its average real income in the period. This figure presents the evolution of the average incomes of every category. It can be observed that the full-time non-wage earners perceive the highest average incomes among the employed individuals. In contrast, the underemployed workers register the lowest average incomes.[31]

The income series corresponding to full-time wage earners follows a similar pattern to the average income of the employed workers we examined above, with an initial expansion that peaks in 1994:1, followed by a contraction and a new expansion. Between the extremes of the period, however, this group's real income grew by 17 per cent. Thus, the income gap between this group and the involuntarily underemployed increased significantly during the nineties.

Finally, the group of the full-time non-wage earners also reached an income peak in 1994:1, but the highest in the period is 1998:1. Despite the decline observed thereinafter, this group's average real income increased by 10.5 per cent between 1991:1 and 2000:2. Thus, a wider income gap between full-time workers and underemployed ones jointly with a fall in the internal dispersion within the former group are verified between the extremes of the series.

The following table decomposes the increase in the average income of the employed workers by type of occupation, as was explained at the beginning of the chapter.

Table 13
Decomposition of the rate of increase in per capita income
of the employed workers by type of occupation

Type of occupation	Income contribution	Employment contribution	Total
Full-time wage earner	12.0%	-6.0%	6.0%
Full-time non wage earner	2.8%	-5.1%	-2.3%
Involuntarily underemployed	-0.7%	5.5%	4.8%
Total	14.0%	-5.6%	8.5% ≈ 8.8%

The income effect was positive in this case, while the changes in employment structure had a negative contribution.

The income effect is concentrated in the group of the full-time wage earners (+12 per cent). However, half of this impact was offset by a negative contribution of employment (-6 per cent) in this group. In only one case was the structure effect positive: the employment contribution was +5.5 per cent for the involuntarily underemployed workers. Furthermore, this is the only group with a negative income contribution. The full-time non-wage earners present a negative contribution given that the fall in their participation in employment surpassed a positive income contribution.

6.2 Employment and income by gender

We can perform the same decomposition by gender. As Figure 33 shows, an important increase in women's participation in total employment took place in the period, particularly from 1997.

Male workers' participation declined by 3.5 p.p.. From about 63 per cent of the employed labor force at the beginning of the nineties, this group fell to less than 60 per cent. However, two different phases can be identified. Firstly, from 1991:1 to 1994:2, male

---

[31] We will return later to the income differential between the latter group and the rest, trying to determine if it is explained exclusively by the gap in hours worked or also by a difference in hourly incomes.

participation tended to increase. From then, this trend turned negative. An interpretation suggests that a "secondary worker effect" may have been triggered by the fall in real wages, with women joining the labor force to compensate for the loss in household income. There may also be a higher number of head-of-household women with a more stable behavior in the labor force.[32] To clarify this point we present the evolution of incomes by gender in the nineties (see Figure 34).

Male's average real income follows the pattern of average incomes in the economy, with a peak in 1994:1. Women's income peaked in 1994:2. Both cases were followed by a decline.

Women's income rose again from 1996 but did not reach its preceding peak. Male's income recovered briefly, only to fall again in 1999-2000. However, the gap between both groups declined. The joint effect of changes in employment and incomes is summarized in the following table.

Table 14
Decomposition of the rate of increase in per capita income of the employed workers by gender

Gender	Income contribution	Employment contribution	Total
Female	4.3%	2.5%	6.8%
Male	5.1%	-3.5%	1.6%
Total	9.4%	-1.0%	8.4% ≈ 8.8%

Grouping the employed workers by gender, the income effect is positive and clearly the most important because the employment effects have opposite signs and partially cancel each other out. Had the 1991 employment structure remained constant, the average income would have risen by 9.4 per cent. But the changes in employment composition account for a negative effect of -1 per cent. The total variation is explained basically by the female workers, for which both effects are positive and total 6.8 per cent. Male workers' income contribution (+5.1 per cent) surpasses women's. However, it is partially offset by a negative employment effect (-3.5 per cent).

6.3 Employment and income by educational category

We now focus on educational levels. The categories, primary, secondary and tertiary, include those workers with complete and partial (incomplete) education in the category. Figure 35 shows how the employed workers were distributed across educational categories in the period.

An important improvement in the educational level of the working population can be observed in the figure. The increase in the participation of people with tertiary education is striking. The group with secondary level also tended to gain participation in total employment, while those employed with only primary education showed a sharp decline. This phenomenon can be attributed to the increase in the average educational level of both the population as a whole[33] and the active population in particular, as well as to a differential impact of unemployment on the different groups. The following table presents a synthesis of the changes in educational levels of different population groups between the beginning and end of the period.

---

[32] For further details on the instability in the labor market in Argentina, see Beccaria and Maurizio (2001).
[33] We refer here to the population between the ages of 15 and 65.

Table 15
Population's educational structure (%) and variations between 1991:1 and 2000:2

	Population			Active population			Employed		
	1991:1	2000:2	Var.(p.p.)	1991:1	2000:2	Var.(p.p.)	1991:1	2000:2	Var.(p.p.)
Primary	44.13%	33.07%	-11.06	42.44%	33.11%	-9.33	42.16%	31.94%	-10.22
Secondary	38.54%	43.57%	5.03	37.06%	40.15%	3.09	36.93%	39.65%	2.72
Tertiary	17.33%	23.36%	6.03	20.50%	26.74%	6.24	20.91%	28.41%	7.50

Memo: the notation p.p. refers to percentage points of the population.

As was mentioned above, the rise in the ratio between the number of jobholders with tertiary education and the total number of employed workers (an increase equivalent to 7.5 p.p. in the period) can be explained by the increase in the group with higher education as a fraction of both the total population (6.03 p.p.) and the active population (6.24 p.p.).

In contrast, the participation of the group with only primary education declined in all cases (-11.06 p.p. in the total population, -9.33 p.p. in the active population and -10.22 p.p. in the employed population).

The active workers with only primary education were hit by unemployment more intensely than those individuals with higher educational levels. For the tertiary group, for instance, occupation increased more than activity (7.50 p.p. against 6.24 p.p.). In contrast, for the primary group the fall among the employed surpassed that of the active individuals. Figures 36, 37, and 38 present the series of participation of the different groups by educational level in the employed, the active, and the total population.

For all educational categories the participation in the active and employed groups follows the same trend observed in the entire population.[34] This supports the idea that the rise in the educational level of the employed workers is due primarily to a supply shock.

Having examined the evolution of employment by educational categories, we now focus on the behavior of income in the employed workers for the same groups. Figure 39 illustrates this point.

We see that the incomes of workers with primary and secondary education had a similar behavior in the period, contrasting with the series corresponding to people with a tertiary education. The former groups show an initial expansionary phase that ends in 1992:2 for the primary level workers and in 1993:1 for those with secondary. Then, and despite some brief reversions, both series tended to fall toward the end of the period.

In the initial phase the average real income rose by 17 per cent and 20 per cent for workers with primary and secondary education, respectively. However, the accumulated variations between beginning and end of the period were both negative: -7.5 per cent and -5 per cent, respectively.

The expansionary phase for the group with tertiary education was longer (it extended to 1994:2) and its average real income increased by about 24 per cent. From 1995, this series fluctuated around a slightly negative trend, but unlike the other educational groups, it accumulated an increase of 12 per cent between the extremes of the period. Thus, the evolution of income inequality by educational groups is basically explained by the increase in the gap between workers with a tertiary education and the rest, as we will show below.

---

[34] A test for the hypothesis that these series have statistically similar trends is included below as an Appendix to this chapter.

We now decompose the rate of increase in the average income of the employed workers between 1991:1 and 2000:2 into an "income effect" and a "structure effect" by educational level. The results are the following:

Table 16
Decomposition of the rate of increase in per capita income of the employed workers
by educational levels

Educational level	Income contribution	Employment contribution	Total
Primary	-2.3%	-8.2%	-10.5%
Secondary	-1.7%	3.4%	1.6%
Tertiary	3.9%	13.1%	17.0%
Total	-0.1%	8.2%	8.1%≈ 8.8%

As was the case with the analysis by type of occupation and gender, every cell in the table can be interpreted as the change in average real income of the employed that would have been observed had the other variables remained constant. Thus, in the aggregate, the structure (or employment-composition) effect by educational categories accounts for the total increase in average income (that surpassed 8 per cent). With the initial employment structure, the average income would have decreased by 0.1 per cent. In contrast, given the initial incomes, the changes in employment composition by education might have accounted for a rise of 8.2 per cent in the average income. The effect of the increase in the participation of the tertiary-level workers in total employment is striking. Had other factors remained constant, this change would have explained a 13.1 per cent rise in average income.

Finally, it is interesting to analyze the effects of the evolution of employment and unemployment by educational level. To contribute to the analysis of the relevance of demand factors on the educational structure of the labor force, Figure 40 shows the employment rate for the people at each educational level measured as a percentage of the active population in the same educational category. The distance between the curves and the 100 per cent horizontal line reflects the respective unemployment rates. It can be observed that the unemployment rates grew throughout the period for people in all the three educational categories. Furthermore, the rates for all groups fluctuate with the cycle of the total employment rate.

However, for the population with primary and secondary education the decline in the employment rate from 1992 was more intense. The following table summarizes the changes in the employment rates.

Table 17
Changes in the employment rates by educational levels
(% of the active population in each category)

Category	91:1-94:1	94:1-98:1	98:1-2000:2	91:1-2000:2
Primary	-5.30	-3.50	-2.1	-10.90
Secondary	-4.30	-5.20	0.2	-9.30
Tertiary	-4.30	-0.70	-0.3	-5.30
Total	-5.00	-3.00	-0.6	-8.60

Taking the period as a whole, we see that the unemployment rates rose for all educational levels, but more than average for the primary and secondary levels and less than average for the tertiary group.

The phase from 1994 to 1998 presents the greatest differences in the behavior of unemployment rates by educational level. Although the rate of unemployment of the group with tertiary education also increases, its variation is considerably smaller. The fall in the employment rate for the primary educated workers observed in the period doubled that of the tertiary group. The existence of unemployment in all these categories of workers implies that the incomes by educational levels that we have just analyzed cannot be considered equilibrium returns. Instead, they arise in a disequilibrium situation in the labor market.

Finally, as we have already mentioned, unlike the other decompositions presented here, the educational one presents a positive employment effect that is greater than the income effect. This is in part a consequence of the significant changes observed in the educational structure of the population in the period.

Appendix to Chapter 6

We have observed in this chapter that, for all educational categories, the participation in the active and employed groups follows the same trend observed in the entire population (see Figures 36, 37, and 38).

To test the hypothesis that these series have statistically similar trends we built ad-hoc time series for every educational level. Each series has 44 observations. The first 22 correspond to either the educational level of the population or to the educational level of the active workers, alternatively. The other 22 observations always correspond to the educational level of the employed workers.

We then regressed each of these series against a trend, a dummy variable (DU) that takes zero value from the beginning of the period to the 22nd observation and one thereinafter, and the product of the same dummy and the trend variable. The latter coefficient captures the structural change in the dependent variable. If the change in the structure of occupation by educational levels merely reflects a higher education-level supply shock, the coefficient should not be statistically significant. The following table presents the results.

In effect, the coefficients of the product DU*trend are not statistically significant in all cases, with the exception of workers with secondary education in the series of the population/employed, thus verifying that the educational structure of the labor force had been basically determined by populational trends.

Table 18
Analysis of the education trend

Variable	Population/Employed			Active/Employed		
	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary
@trend	-0.655	0.234	0.421	-0.546	0.108	0.438
	(-30.0)	(7.26)	(15.2)	(-24.2)	(3.32)	(15.3)
@trend*DU	0.069	-0.144	0.075	-0.039	-0.017	0.057
	(1.22)	(-3.15)	(1.91)	(-1.25)	(-0.38)	(1.41)
DU	10.73	-3.39	-7.339	12.61	-2.191	-10.413
	(13.94)	(-2.98)	(-7.51)	(15.83)	(-1.91)	(-10.2)
C	46.10	38.64	15.26	44.22	37.439	18.33
	(172.40)	(97.75)	(44.97)	(159.9)	(93.81)	(52.12)
R^2	0.977	0.802	0.955	0.967	0.339	0.932

7. Income distribution by categories of workers

We have just examined the evolution of the average real income of the employed workers, identifying the income and structure effects that affected it. We will now focus on income distribution, employing the same categories of workers as in the preceding chapter.

As was already mentioned, an important characteristic of the Theil index of income distribution inequality is that it can be decomposed in an additive way. Organizing the population in groups by characteristics of workers and jobs that are relevant to the analysis of income distribution, a first element in the Theil decomposition measures the impact of within-group wage differentials (*within effect*). A second component of the Theil index shows the impact of the differences in average income between groups (*between effect*). The latter reflects the returns of each category, while the within effect captures the impact of other factors (different from those variables employed to classify the population).

The decomposition can be expressed as follows:

$$T = \sum_{g=1}^{G} \left(\frac{\mu_g N_g}{\mu \ N} x \ln\left(\frac{\mu_g}{\mu} \right) \right) + \sum_{g=1}^{G} \left(\frac{\mu_g N_g}{\mu \ N} \left(\sum_{j \in g} \frac{w_j y_j}{\mu_g N_g} x \ln\left(\frac{y_j}{\mu_g} \right) \right) \right)$$

$$T = TB + \sum_{g=1}^{G} \frac{\mu_g N_g}{\mu \ N} x TW_g = TB + TW$$

where N stands for the expanded number of individuals, w is the expansion factor for individual "j", y_j stands for her income, μ is the average income, μ_g stands for the average income of each group and N_g is the number of individuals in each group.

In other words, total inequality at a point in time emerges as the sum of both inequality among groups and inequality among individuals within groups. The latter results, on the other hand, from the weighted sum of the inequality measures obtained for every group, while the weights are defined as the ratio of group income to total income.

Additionally, the changes in income inequality between different points in time can be decomposed in three different effects: a structure effect, a within-group effect and a between-groups effect. All three explain the changes in the aggregate behavior of the Theil index.

These exercises in decomposition have been developed for the same categories used in the analysis of the evolution of incomes: type of occupation (full-time wage earners, full-time non-wage earners and involuntarily underemployed), gender and educational level (primary, secondary, and tertiary).[35]

7.1 Income distribution by type of occupation

Let us begin by focusing on the effect that the type of occupation has on income inequality. The results of the Theil decomposition are presented in Table 19.

A strong within effect is clear, indicating a large wage dispersion inside each group. Both components rise in absolute terms. However, the within effect shows a declining trend in relative terms throughout the nineties. In contrast, the inequality among groups

---

[35] The changes in the Theil index were multiplied by 100.

increases by about 12 percentage points, explained basically by a wider wage gap between full-time workers and underemployed workers, as we have already showed. The three effects present positive signs, the between effect being the most important. With a constant structure by category of occupation and constant within-group inequality, total inequality might have increased by 39 per cent during the decade. The positive structure effect is due to a lower participation of the full-time wage earners, the group with the smallest wage dispersion.

Table 19
Decomposition of the Theil coefficient
by type of occupation

Observation	Between effect	Within effect	Between effect (%)	Within effect (%)
May 1991	0.0427	0.2686	13.7%	86.3%
October 1991	0.0393	0.2744	12.5%	87.5%
May 1992	0.0466	0.2339	16.6%	83.4%
October 1992	0.0420	0.2415	14.8%	85.2%
May 1993	0.0440	0.2665	14.2%	85.8%
October 1993	0.0454	0.2496	15.4%	84.6%
May 1994	0.0633	0.2482	20.3%	79.7%
October 1994	0.0574	0.2389	19.4%	80.6%
May 1995	0.0721	0.2412	23.0%	77.0%
October 1995	0.0852	0.2551	25.0%	75.0%
May 1996	0.0771	0.2465	23.8%	76.2%
October 1996	0.0879	0.2778	24.0%	76.0%
May 1997	0.0821	0.2764	22.9%	77.1%
October 1997	0.0794	0.2517	24.0%	76.0%
May 1998	0.0926	0.2636	26.0%	74.0%
October 1998	0.0980	0.2724	26.5%	73.5%
May 1999	0.0905	0.2658	25.4%	74.6%
October 1999	0.0888	0.2673	24.9%	75.1%
May 2000	0.1008	0.2893	25.8%	74.2%
October 2000	0.1000	0.2828	26.1%	73.9%

Variations between 1991:1 and 2000:2		
Effect	Value	(%)
Within	2.3169	32%
Between	2.7425	39%
Structure	2.0944	29%
Total	7.1537	100%

7.2 Income distribution by gender

We next present the Theil decomposition by gender (Table 20). It can be seen that total inequality can almost completely be explained by within-category inequality, while gender accounts for only about 4 per cent throughout the entire decade. This means that this variable is not relevant either to explain inequality among the employed workers or its rising trend.

Table 20
Decomposition of the Theil coefficient
by gender

Observation	Between effect	Within effect	Between effect (%)	Within effect (%)
May 1991	0.0156	0.2957	5.0%	95.0%
October 1991	0.0142	0.2995	4.5%	95.5%
May 1992	0.0127	0.2678	4.5%	95.5%
October 1992	0.0134	0.2701	4.7%	95.3%
May 1993	0.0175	0.2931	5.6%	94.4%
October 1993	0.0156	0.2794	5.3%	94.7%
May 1994	0.0163	0.2952	5.2%	94.8%
October 1994	0.0093	0.2871	3.1%	96.9%
May 1995	0.0109	0.3024	3.5%	96.5%
October 1995	0.0146	0.3257	4.3%	95.7%
May 1996	0.0162	0.3074	5.0%	95.0%
October 1996	0.0145	0.3512	4.0%	96.0%
May 1997	0.0130	0.3455	3.6%	96.4%
October 1997	0.0102	0.3209	3.1%	96.9%
May 1998	0.0127	0.3435	3.6%	96.4%
October 1998	0.0162	0.3541	4.4%	95.6%
May 1999	0.0097	0.3467	2.7%	97.3%
October 1999	0.0122	0.3439	3.4%	96.6%
May 2000	0.0112	0.3789	2.9%	97.1%
October 2000	0.0126	0.3702	3.3%	96.7%

Variations between 1991:1 and 2000:2		
Effect	Value	(%)
Within	7.6637	108%
Between	-0.1136	-2%
Structure	-0.3963	-6%
Total	7.1537	100%

It may be worth pointing out here that the latter statement is not in contradiction with the fact (illustrated by Figure 34 and econometrically tested in the Appendix to Chapter 8) of a male workers' average income significantly higher than women's one. What the Theil decomposition shows is that this differential between groups explains only a minor part of total inequality. In other words, the level of the Theil index fundamentally depends on other characteristics of the population like, for instance, the educational level.

Moreover, the between effect declined in the nineties, with a negative variation of about 2 per cent, a phenomenon that is compatible with the falling income gap between both groups we have already pointed out.

In contrast, the within effect is positive (about 108 per cent). The increase in women's participation in total employment, together with the group's lower internal dispersion, makes the structure effect negative (and about -6 per cent).

7.3 Income distribution by educational categories

The following table presents the results of the Theil decomposition for the groups organized by educational level.

Two main observations stand out. Firstly, the relevance of within-group inequality: It explains more that 77 per cent of total inequality in every year. This phenomenon is a consequence of the strong income heterogeneity within each educational group. Secondly, even if this inequality component has grown in absolute terms between the extremes of the period, its participation in total inequality fell by about 10 percentage points in the decade. In contrast, a significant increase can be observed in the relevance of the between-group inequality in absolute and relative terms. This clearly shows the strong rise in educational returns throughout the period.

Table 21
Decomposition of the Theil coefficient
by educational level

Observation	Between effect	Within effect	Between effect (%)	Within effect (%)
May 1991	0.0364	0.2748	11.7%	88.3%
October 1991	0.0603	0.2534	19.2%	80.8%
May 1992	0.0382	0.2422	13.6%	86.4%
October 1992	0.0414	0.2422	14.6%	85.4%
May 1993	0.0444	0.2661	14.3%	85.7%
October 1993	0.0507	0.2442	17.2%	82.8%
May 1994	0.0528	0.2587	16.9%	83.1%
October 1994	0.0531	0.2433	17.9%	82.1%
May 1995	0.0585	0.2548	18.7%	81.3%
October 1995	0.0742	0.2661	21.8%	78.2%
May 1996	0.0638	0.2598	19.7%	80.3%
October 1996	0.0793	0.2864	21.7%	78.3%
May 1997	0.0693	0.2893	19.3%	80.7%
October 1997	0.0718	0.2593	21.7%	78.3%
May 1998	0.0717	0.2846	20.1%	79.9%
October 1998	0.0847	0.2857	22.9%	77.1%
May 1999	0.0758	0.2806	21.3%	78.7%
October 1999	0.0803	0.2758	22.6%	77.4%
May 2000	0.0782	0.3175	19.8%	80.2%
October 2000	0.0841	0.2986	22.0%	78.0%

Variations between 1991:1 and 2000:2		
Effect	Value	(%)
Within	1.5336	21%
Between	3.6468	51%
Structure	1.9733	28%
Total	7.1537	100%

The observed variations imply a positive within effect of about 21 per cent. That is, had both the educational structure and the educational returns remained constant, total inequality would have grown by that percentage. The between effect accounts for a 51 per cent increase in total inequality among the employed people owing basically to the

widening of the wage gap between the group with tertiary education and the rest. Finally, the structure effect presents a positive value of 28 per cent. This is because within inequality rises together with the educational level (and thus, with personal income). Given that the highest educated groups increased their participation in employment, total income inequality tended to grow.

A conclusion that arises from this analysis is that, except for gender, the several categories of workers considered here to explain the increase in income inequality among the employed are relevant. In the nineties, the gaps between the incomes of the different groups defined by type of occupation and education widened considerably. It is true that, in these cases, inequality within groups also increased, but these changes were smaller than the "between effect." Thus, the latter explains most of the deterioration in income distribution.

In contrast, in the analysis by gender we verify a decline in the polarization among groups. This means that the income gap between male and female workers tended to diminish in absolute and relative terms in the period.

8. Wage determination

In the last two sections we analyzed income and distribution among employed workers. We now turn back to the impact of unemployment on these variables. Unemployment has a direct and obvious effect on the average income of the active population; but, it also affects the incomes of the employed. Several theoretical frameworks, like the insider-outsider model of wage determination or the efficiency-wages argument, can explain a negative elasticity of wages to unemployment. In what follows we estimate this relationship for the Argentine labor market in the nineties.

8.1 The wage curve

We estimated pooled time series and cross-section equations for the period 1990:1-1998:2, using micro data on 11 urban centers based on the permanent household survey.

The wage equation to be estimated takes the form:

$$\ln w = \partial(x, U_r, r, s, \text{duminic})$$

where w stands for labor income in real terms and U_r represents the unemployment rates in the different urban centers in logs. The terms x, r and s refer to control variables. "x" is a vector of characteristics of workers (gender, education, type of occupation, age and squared age as proxies for the return of experience). "r" and "s" are vectors of dummies (regional and by sector, respectively). Full-time wage earners in manufactures, male, resident in GBA and with complete primary education are the control group. Finally, duminic is a dummy variable whose values are one from 1990:1 to 1992:2 and zero from then on. It captures the initial effect of the stabilization plan on workers' real income.

Given that the unemployment rates change according to both region and time, the unemployment-rate estimated coefficient can be interpreted as the unemployment-elasticity of labor income over both time and region.

Unemployment can affect total incomes through two channels. On the one hand, it reduces the number of hours worked; on the other, it may impact negatively on hourly earnings.

Thus, we estimated the unemployment-rate elasticity of both hourly income and total income. Moreover, we also estimated hours worked (hours in logs) as a function of the same explanatory variables aiming to identify the separate effects of hourly income (price effect) and hours worked (quantity effect) on total income. We made this estimation for both full-time wage earners and all employed workers. We found that although the unemployment rate negatively affects the hourly earnings in all cases, only in the case of the involuntarily underemployed did it also negatively affect the number of hours worked. This effect is verified from the first semester of 1993.

We now present the estimated unemployment elasticities of hourly earnings. The unemployment elasticities of both hours worked and total income will be presented later and exclusively for the involuntarily underemployed.[36]

The explanatory variable in the wage equation was alternatively defined as the unemployment rate *stricto sensu* (Table 22) or as a wider concept by incorporating the rate of involuntary underemployment (Table 23). All the estimations used the OLS method. The estimated coefficients for the control variables were highly significant in most cases, but they are very close to those obtained in the statistical earnings function presented in the Appendix to this chapter. Thus, we have omitted them in the following tables.

Table 22
Unemployment-elasticity of real hourly earnings

	Hourly earnings	
Variable	Full-time wage earner	All employed
Log(rate of unempl/100)	-0.095	-0.102
	(-17.74)	(-20.88)
Duminic*log(rate of unempl/100)	0.027	0.028
	(16.09)	(18.41)

Table 23
Elasticity of real hourly earnings
to the sum of the unemployment and underemployment rates

	Hourly earnings	
Variable	Full-time wage earner	All employed
Log(rate of unempl+ underempl/100)	-0.133	-0.150
	(-20.86)	(-25.64)
Duminic*log(rate of unempl + underempl/100)	0.039	0.043
	(17.86)	(21.17)

In all estimations the coefficients of the explanatory variables are highly significant and have the expected sign. Therefore, the tests do not reject the hypothesis of a negative elasticity of income to unemployment. On the other hand, the duminic coefficient is positive, meaning that the relationship between unemployment and income was different at the beginning of the period, possibly as a consequence of the persistence of wage-indexing practices.

---

[36] The estimated elasticities of real hourly earnings to unemployment are very similar to those obtained for USA, for instance. For further details see Blanchflower and Oswald (1996).

The estimated elasticities are lower for full-time wage earners. The elasticity of hourly income to the unemployment rate is -0.095 for the former, and -0.102 for all employed workers.

This means that the group of both the non-wage earners and the involuntarily underemployed workers faces higher income flexibility. While a 10 percent increase in the unemployment rate causes a fall of 0.95 percent in the hourly wage of full-time wage earners, the decline rises to 1.02 percent for all employed workers.

Note that the involuntary underemployment rate has an additional negative effect on income. As shown in Table 23, the estimated elasticities are -0.133 for full-time wage earners and -0.15 for all employed workers, respectively.

Let us examine the estimated elasticities for the involuntarily underemployed workers. The explanatory variables are the same, but duminic was eliminated owing to the period considered in this case.

Table 24
Unemployment-elasticity of both real earnings
and hours worked for the underemployed workers

Variable	Hourly earnings	Hours worked	Total income
Log(rate of unempl/100)	-0.115	-0.135	-0.250
	(-6.58)	(-8.24)	(-13.65)

The table shows that the increment in the unemployment rate affected this group negatively in two ways: through the fall in its hourly income, on the one hand, and through a decline in the number of hours worked, on the other. A 10 percent increase in the unemployment rate causes a fall of 1.15 percent in the hourly earnings, as well as a fall of 1.35 percent in the number of hours worked. Hence, the implied fall in the total income of the involuntary underemployed amounts to 2.50 percent. This twofold negative impact of an increase in the unemployment rate explains part of the rise in income distribution inequality among the groups of workers defined by type of occupation.

Finally, we estimated the wage curve for full-time wage earners separately for every urban center in the sample, to determine if the estimated elasticities reflect primarily the temporary or the regional effect of unemployment variations. The control variables were the same as before and the estimated coefficients were significant in almost all cases. Table 25 shows the estimated elasticities for every urban center.

It can be observed that the unemployment-elasticities of income were always negative and significant, except in the cases of Santa Cruz and Tucumán, thus revealing that all previous estimated elasticities basically reflect the effect of unemployment on income over time. The unemployment rates rose sharply during the nineties in all urban centers. When the equation for the whole sample is estimated without the regional dummies the resulting elasticities are still significant, but lower than considering the fixed effects.

Table 25
Estimations of the regional elasticities

Variable	Hourly income	
	Log(rate of unempl/100)	Duminic*log(rate of unem/100)
Whole sample	-0.073	0.026
	(-22.95)	(19.23)
GBA	-0.120	0.036
	(-9.71)	(8.11)
Córdoba	-0.100	0.057
	(-7.75)	(11.65)
Jujuy	-0.092	0.021
	(-6.59)	(3.97)
La Pampa	-0.119	0.030
	(-10.64)	(7.71)
La Plata	-0.063	0.030
	(-3.81)	(5.53)
Mendoza	-0.301	0.046
	(-10.38)	(8.84)
Neuquén	-0.325	0.059
	(-5.86)	(4.76)
Rosario	-0.175	0.052
	(-5.34)	(7.09)
Salta	-0.169	0.016
	(-7.37)	(2.62)
Santa Cruz	0.017	0.016
	(0.85)	(4.81)
Tucumán	-0.034	0.035
	(-0.80)	(3.80)

8.2 Wage curve by educational level

It is also interesting to check whether the unemployment elasticities of income are different by educational level to better understand the evolution of income distribution inequality among these groups.

The elasticities were estimated as before, separately for the employed workers with primary, secondary and tertiary education (complete and incomplete in all cases).

As Table 26 shows, the groups with primary and secondary education have roughly similar elasticities (for the eleven urban centers under exam). Their estimated values are -0.088 and –0.092. In contrast, the unemployment elasticity of income presents a much smaller value for the group with tertiary education (-0.049).

This means that workers with only primary or secondary education face higher income flexibility. While a 10 percent increase in the unemployment rate causes a fall of 0.49 per cent in the hourly wage of the employed people with tertiary education, the decline rises to 0.92 per cent and 0.088 per cent for the secondary and primary education groups, respectively.

On the other hand, the duminic coefficient is positive in all cases, meaning that the relationship between unemployment and income was different at the beginning of the period. However, the coefficient is similar in all three cases, suggesting the presence of related consequences of the persistence of wage-indexing practices.

Table 26
Elasticities by educational level,
eleven urban centers

Variable	Hourly wage		
	Primary	Secondary	Tertiary
Log(rate of unempl/100)	-0.088	-0.092	-0.049
	(-11.30)	(-11.47)	(-4.54)
Duminic*log(rate of unempl/100)	0.033	0.021	0.032
	(13.78)	(8.25)	(8.98)

Table 27 presents the results of the estimations for GBA. Since we consider only one urban center, the estimated elasticities reflect the effects of unemployment on income over time.

Again, important differences between the estimated coefficients for each educational group are found. The flexibility of the wage diminishes as the educational level rises. While a 10 percent increase in the unemployment rate causes the wage of workers with tertiary education to fall by about 0.6 percent, the decline climbs to 1.65 percent for the employed workers with primary education.

In synthesis, we have shown that the unemployment rate affects incomes in several ways. It impacts negatively on the average incomes of the active population as a consequence of the increase in the number of unemployed individuals. But the analysis in this section shows that it also affects the incomes of the employed. Additionally, the intensity of this negative impact differs according to the type of occupation and also according to the educational level of different groups of workers. By these different channels, the evolution of the rate of unemployment had a crucial role in determining the rise in income inequality in the nineties.

Table 27
Elasticities by educational level, GBA

Variable	Hourly wage			
	Total	Primary	Secondary	Tertiary
Log (rate of unempl/100)	-0.120	-0.165	-0.099	-0.056
	(-9.71)	(-8.91)	(-4.96)	(-1.94)
Duminic*log (rate of unempl/100)	0.036	0.046	0.021	0.038
	(8.11)	(6.97)	(2.98)	(3.46)

Appendix to Chapter 8. The statistical earnings function

To obtain a more complete description of the population under scrutiny, we estimated incomes statistical equations where the dependent variable is either the total labor income of the individual (totalincome) or the hourly income (hincome), both in logs. In the statistical equations the explanatory variables are dummies by gender, region, educational level, type of occupation, and activity sector. As in the case of the wage curve, we included age and squared age as proxies for the returns of experience.

As we did with the wage setting equation, we estimated pooled cross-section equations using micro data on 11 urban centers for the period 1990:1-1998:2. Also, we estimated hours worked (hours, in logs) as a function of the same explanatory variables aiming to identify the separate effects of hourly earnings and hours worked on total income. The control group was the same: full-time wage earners in manufactures, male,

resident in GBA, and with complete primary education. All the estimations used the OLS method and the estimated coefficients were highly significant in most cases, as Table 28 shows.

Other characteristics remained constant, male-workers' income is 38 percent higher than women's. Half of the difference is explained by hourly income (18 percent higher for male workers) and the other half by more hours worked (18 percent).

The returns of education explain significant differences in personal incomes. The earnings of those workers without a complete primary school education are 20 percent lower than the control group. Moreover, a positive differential arises for higher educational levels: incomplete secondary school education accounts for an income that is 16 percent higher than the control group. The differential climbs to 39 percent for those with a complete secondary-school education, and to 49 percent and 87 percent for workers with incomplete and complete tertiary education, respectively. Given that the differences in hours worked by educational level are small, those income gaps are almost totally explained by hourly wages. Moreover, workers with tertiary education either complete or incomplete work fewer hours (1.4 percent and 6 percent less, respectively) than the control group. This factor attenuates the labor income gap.

Furthermore, there are also significant income gaps among workers by type of occupation. Earnings of the involuntarily underemployed and the full-time non-wage earners, for instance, are 61 percent and 2 percent lower[37] than those of the full-time wage earners, respectively. However, the involuntarily underemployed work 83 percent fewer hours than the base group and their hourly wage is 22 percent higher than full-time wage earners. On the other hand, non-wage earners make up for a lower wage by working more hours.

Additionally, the regional dummies show that both total labor incomes and hourly wages fall below GBA levels in every other urban center, with the exception of Santa Cruz. These gaps are explained by hourly wages because there are no regional differences in the number of hours worked. Moreover, age has a positive impact on hourly and total personal income, thus reflecting the returns of experience.

Finally, by activity sectors, the total labor incomes of workers in "electricity, gas, and water," "transport" and "financial services" are 16 percent, 6 percent and 14 percent higher than those in manufactures, respectively. For other sectors, the income differential is negative.

---

[37] This number may seem to contradict what can be observed in Figure 32: the average real income of the full-time non-wage earners is higher than the other series represented there. Beyond the fact that the Figure shows an average income and here we refer to an econometrically obtained coefficient, it is worth mentioning that the average earnings illustrated in Figure 32 belong to GBA, while the econometric estimation has been done with data from 11 urban centers, including the GBA. It is possible that the full-time non-wage earners in the latter region (with a significant presence of professional workers) obtain an average income higher than the same category of workers in the rest of the country.

Table 28. The Statistical Earnings Function

Variable	Dependent Variable		
	Log(totalincome)	Log(hincome)	Log(Hours)
Female	-0.379	-0.184	-0.185
	(-130.6)	(-63.8)	(-92.6)
Córdoba	-0.244	-0.242	-0.006
	(-50.8)	(-50.2)	(-1.8)
Jujuy	-0.502	-0.523	0.017
	(-92.8)	(-96.3)	(4.7)
La Pampa	-0.178	-0.166	-0.020
	(-39.8)	(-36.9)	(-6.6)
La Plata	-0.163	-0.169	0.001
	(-.29.9)	(-30.9)	(0.4)
Mendoza	-0.328	-0.327	-0.005
	(-58.9)	(-59.6)	(-1.3)
Neuquén	-0.032	-0.047	0.009
	(-5.6)	(-8.3)	(2.5)
Rosario	-0.202	-0.183	-0.023
	(-38.6)	(-35.4)	(-6.5)
Salta	-0.464	-0.485	0.017
	(-86.8)	(-92.0)	(5.0)
Santa Cruz	0.076	0.090	-0.022
	(15.5)	(18.2)	(-7.1)
Tucumán	-0.411	-0.429	0.017
	(-65.6)	(-67.6)	(4.0)
Incomplete primary	-0.203	-0.144	-0.055
	(-43.7)	(-30.8)	(-15.9)
Incomplete secondary	0.160	0.151	0.010
	(44.6)	(41.3)	(3.9)
Complete secondary	0.387	0.375	0.013
	(102.2)	(98.2)	(5.4)
Incomplete tertiary	0.486	0.548	-0.062
	(100.0)	(113.8)	(-18.6)
Complete tertiary	0.868	0.883	-0.015
	(185.8)	(193.3)	(-4.9)
Involuntarily underemployed	-0.613	0.217	-0.836
	(-135.9)	(51.1)	(-220.2)
Full-time non-wage earner	-0.019	-0.057	0.038
	(-5.3)	(-14.9)	(19.9)
Electricity, gas, and water	0.162	0.246	-0.082
	(17.7)	(25.9)	(-17.0)
Construction	-0.116	-0.062	-0.051
	(-20.3)	(-10.8)	(-16.5)
Commerce	-0.068	-0.110	0.041
	(-14.6)	(-23.7)	(15.7)
Transport	0.0657	0.004	0.047
	(11.0)	(0.7)	(15.9)
Financial services	0.136	0.160	-0.027
	(22.7)	(26.5)	(-8.4)
Other services	-0.029	0.106	-0.137
	(-7.3)	(26.0)	(-55.4)
Age	0.075	0.054	0.021
	(103.5)	(85.6)	(43.3)
Age^2	-0.001	-0.001	-0.001
	(-84.71)	(-65.1)	(-42.5)
C	4.672	-0.285	4.968
	(341.0)	(-23.3)	(543.2)
Number of observations	211333	211333	211333

9. An integrated analysis of the factors affecting income distribution

The previous chapters identified several separate factors that explained the changes in income distribution in the nineties. In this section we present an integrated analysis of these changes as well as estimations of the quantitative relevance of the main explanatory factors. To this purpose, we use a methodology based on microsimulations with EPH data for the GBA and from three different moments: October 1991, May 1994, and May 1998.

The decomposition analysis of the separate effects of different factors on income distribution considers, firstly, several specifically economic determinants, such as the structure of employment by activity sector, the unemployment rate, and the level of wages. Secondly, it takes into consideration the changes in education and in the participation rate. Thirdly, it includes other socio-demographic factors such as the age structure and the composition of households. The methodology maintains the initial demographic characteristics as constant parameters to estimate both the separate and joint impacts of the different economic factors, as well as those of changes in participation and education.

The exercises try to answer questions like: With constant 1991 socio-demographic characteristics, what would the 1994 income distribution have been given the observed changes in the structure of wages? To answer that question, other determinants like the composition of employment by productive sector, the economic activity rate, the unemployment rate and the educational levels are also kept constant. The microsimulation exercise is repeated changing these other factors, one by one, for 1994, and for 1998. In each case the income distribution by household is determined. As the methodology is based on the generation of random numbers (to select the individuals in the sample whose characteristics are assumed to change in each exercise) it is necessary to take into account the uncertainty involved. Therefore, every microsimulation was repeated 5000 times and intervals of 95 percent of confidence were obtained for each measure of computed inequality.[38]

The simulation with the 1994 observed levels of the determinants of income distribution provides information about an intermediate moment in the period. However, it can also be considered a counter-factual exercise. In fact, a simulation of income distribution with the 1994 characteristics can be taken as representative of the effects that the policy regime established in 1991 could have had in a context of continuously increasing capital inflows, as occurred before the experienced episodes of high volatility.

The comparison between 1998 and 1991, on the other hand, contrasts the initial conditions with the effective ones at a peak when the regime had already completed a cycle of expansion and recession.

Results

Table 29 presents the simulated changes in income distribution between 1991 and 1994, measured by the Gini coefficients according to both per capita household income and household income by equivalent adult.[39] The table presents the separately estimated effects. For example, the participation effect is measured by the Gini coefficient that would have been obtained with the 1994 economic participation rate instead of the 1991 one. The

---

[38] For a complete development of the methodology see Frenkel and González Rozada (2000b).

[39] The income by "equivalent adult" is obtained by dividing the total income of a household by the number of its members and corrected by the different caloric requirements of these members.

effect of unemployment is measured by the Gini coefficient that would have been obtained if the only variable to change had been the unemployment rate, while the participation rate, the education structure, and the income level remained constant, and so on. The statistically significant effects are indicated in bold. The numbers in parentheses are intervals of confidence (at 95 percent significance) obtained through five thousand simulations.

As the table shows, the participation effect is not statistically significant for either the employed or for the active population, and it marginally diminishes inequality for the total population. The change in the structure of employment between 1991 and 1994 reduces inequality for the employed population. The unemployment effect is positive and significant: It increases inequality for both the active and the total population. The unemployment factor would have increased inequality by 5 percent for the active and by 3 percent for the total population, on average, had the other determinants remained unchanged. On the other hand, the observed changes in the educational structure of the employed population could explain the fall in income distribution inequality. The same can be said of this factor's impact on both the active and the total population.

Table 29
Effects of changes in the wage and employment structure
on income distribution inequality between 1991 and 1994

	Households' per capita income			Households' income by equivalent adult		
	Employed	**Active**	**Total**	**Employed**	**Active**	**Total**
Gini Coefficient, 1991	**0.480**	**0.491**	**0.485**	**0.473**	**0.486**	**0.479**
Participation Effect	0.473	0.488	**0.483**	0.468	0.482	**0.476**
	(0.468 0.479)	(0.482 0.496)	(0.481 0.485)	(0.463 0.475)	(0.476 0.490)	(0.473 0.478)
Employment Effect	**0.469**	0.491	0.485	**0.464**	0.486	0.479
	(0.463 0.475)	(0.485 0.496)	(0.479 0.492)	(0.457 0.469)	(0.481 0.491)	(0.472 0.486)
Unemployment Effect	0.482	**0.516**	**0.500**	0.478	**0.512**	**0.494**
	(0.469 0.496)	(0.505 0.528)	(0.488 0.510)	(0.465 0.492)	(0.501 0.524)	(0.482 0.506)
Education Effect	**0.458**	**0.478**	**0.470**	**0.450**	**0.472**	**0.462**
	(0.449 0.468)	(0.470 0.488)	(0.463 0.477)	(0.442 0.459)	(0.464 0.481)	(0.456 0.469)
Income Effect						
Combined	**0.473**	**0.486**	**0.478**	**0.468**	**0.482**	**0.472**
By Productive Sector	**0.478**	**0.492**	**0.485**	**0.473**	**0.487**	**0.479**
By Education	**0.485**	**0.499**	**0.494**	**0.480**	**0.494**	**0.487**
By Gender	**0.477**	**0.491**	**0.485**	**0.472**	**0.486**	**0.479**
By Occupation	**0.477**	**0.491**	**0.485**	**0.472**	**0.486**	**0.479**
Gini Coefficient, 1994	**0.457**	**0.471**	**0.467**	**0.449**	**0.465**	**0.459**

The income effect is estimated according to the different groupings considered in our analysis of the labor market (that is, by productive sector, education, gender and type of occupation). It is calculated by multiplying the initial wage of the individual i in the segment j for the observed change of the average wage of the segment, from the base year to the year of the simulation. The combined income effect summarizes the changes in all

the segments of the labor market. As the income effects analyzed here are individual effects, it is not possible to obtain intervals of confidence. According to the figures in Table 29, the combined income effect slightly reduces the income inequality index for the three populations. It is also worth mentioning that the income effect by educational level increases the inequality index in all cases.

Table 30 presents the exercises that compare 1991 and 1998. The greatest difference in comparison with the previous simulations lies in the fact that the effect of the observed changes in the educational structure of the employed population are not statistically significant either for the active or for the total population. They only reduce income inequality in the case of the employed population.

Table 30
Effects of changes in the wage and employment structure
on income distribution inequality between 1991 and 1998

	Households' per capita income			Households' income by equivalent adult		
	Employed	Active	Total	Employed	Active	Total
Gini Coefficient, 1991	**0.480**	**0.491**	**0.485**	**0.473**	**0.486**	**0.479**
Participation Effect	0.474	0.487	**0.483**	0.469	0.481	**0.475**
	(0.469 0.483)	(0.481 0.495)	(0.480 0.485)	(0.463 0.476)	(0.475 0.489)	(0.473 0.478)
Employed Effect	**0.469**	0.491	0.485	**0.464**	0.486	0.479
	(0.462 0.478)	(0.484 0.496)	(0.475 0.493)	(0.456 0.470)	(0.479 0.492)	(0.468 0.487)
Unemployed Effect	0.485	**0.529**	**0.507**	0.480	**0.525**	**0.501**
	(0.469 0.499)	(0.514 0.540)	(0.492 0.517)	(0.465 0.493)	(0.511 0.537)	(0.487 0.512)
Education Effect	**0.466**	0.487	0.481	**0.460**	0.482	0.474
	(0.461 0.477)	(0.482 0.497)	(0.477 0.488)	(0.455 0.470)	(0.477 0.490)	(0.469 0.480)
Income Effect						
Combined	**0.485**	**0.498**	**0.488**	**0.480**	**0.494**	**0.483**
By Productive Sector	**0.484**	**0.497**	**0.491**	**0.479**	**0.493**	**0.484**
By Education	**0.498**	**0.511**	**0.506**	**0.493**	**0.507**	**0.500**
By Gender	**0.477**	**0.491**	**0.486**	**0.487**	**0.487**	**0.479**
By Occupation	**0.481**	**0.494**	**0.489**	**0.490**	**0.490**	**0.482**
Gini Coefficient, 1998	0.507	0.526	0.519	0.499	0.522	0.513

As was the case between 1991 and 1994, the change in the structure of employment by sectors between 1991 and 1998 reduces income inequality for the employed population. Had it been the 1998 employment structure instead of that of 1991, the income inequality index would had been 2 percent lower (on average) for the employed population. The unemployment effect is once again positive and significant: It raises income inequality for both the active and the total population, and this impact surpasses what had been observed between 1991 and 1994. The effect causes a worsening in income distribution of almost 8 percent for the economically active population and of about 5 percent for the total population.

Taking into account the estimated confidence intervals it could be said that the unemployment effect would have been an increase of the inequality index of about 4.7 to 10 percent for the active population and about 1.5 to 6.6 percent for the total population.

Finally, in contrast with the previous period, the combined income effect increases the distributive inequality, though moderately. The same can be said of the income effects by productive sector, by education, and by type of occupation, for the three populations considered here. The wage changes by gender, however, diminished the income inequality indexes in the case of the employed workers.

10. Poverty and indigence

This section examines the evolution of both poverty and indigence in GBA in the nineties applying the methods of the "Poverty Line" and of the "Indigence Line," respectively. These procedures aim to establish whether the household has the capacity to satisfy a set of basic needs.

In the particular case of the Indigence Line the household income is compared with the cost of a basic basket of food defined as a minimum threshold of energy and protein requirements. To estimate the poverty line the basket is expanded to include the cost of a complimentary set of goods. The non-food complimentary basket basically incorporates clothing, transport, education, and health expenditures.

These procedures measure variations in the poverty conditions in the short term, while "structural poverty" is better captured through the Unsatisfied Basic Needs (UBN) approach. In fact, the UBN indicator may be considered inappropriate for measuring temporary changes. It was designed to make regional comparisons in housing, sanitary, and educational conditions, thus contributing to improving the allocation of the social public expenditure.[40] We will employ only the first approach here.

Increments in poverty as measured by incomes have been observed in Argentina in periods in which it was falling if measured with the UBN approach. These opposite movements are basically due to income losses of middle-class sectors in periods in which social investment was rising. This factor may cause, *ceteris paribus*, a decrease in structural poverty.

Table 31 presents the evolution of the poverty and indigence indexes (for individuals and households) for the period May 1991 to October 2000.

As we can see in the table and in Figure 41, the incidence of poverty among individuals and households present very similar patterns in the period. Both indexes experience a fall from the beginning of the decade until the first semester of 1994, when the minimum for the entire period is registered. While 21.9 percent of the households and 29 percent of the individuals were below the poverty line in the first semester of 1991, these percentages fell to 12 and 16 percent, respectively in the first semester of 1994.

This phase accompanies the expansionary cycle of real income shown in previous sections. From then to the second semester of 1996 the poverty indexes grow, almost completely reversing the improvements obtained in the first phase. Then, from 1996:2 to 1998:1, the poverty indicators fall followed by a new rise until the end of the period. Beyond these cyclical movements, both indexes in Figure 41 had very similar levels in 2000:2 to those registered at the beginning of the nineties.

On the other hand, the evolution of indigence (see Figure 42) also presents phases of growth and fall. But unlike poverty indicators, indigence levels increased in the period. Between 1991:1 and 2000:2 increments of 2 and 2.6 percentage points were observed in the numbers of indigent households and individuals, respectively. The minimum for the

---

[40] Additionally, the UBN indicator is only available until the year 1997.

period is the second semester of 1991, when 2.2 percent of the households and 3 percent of the individuals were unable to cover their basic food needs with their current incomes.

Subsequently, unlike the evolution of poverty, these percentages rose until the second semester of 1993. From the second semester of 1994 up to 1996 the household indigence index accumulated an increment of 83 percent, a percentage that was doubled for individuals. Furthermore, the percentages of both indigent households and individuals experienced a fall in the first semester of 1998 then to increase until the end of the series. Therefore, a more favorable behavior of poverty rather than indigence indexes can be observed.

Table 31
Poverty and indigence indexes
(% of households and individuals)

Observation	Poverty Indexes		Indigence Indexes	
	Households	Indivi-duals	Households	Individuals
May 1991	21.9	28.9	3.6	5.1
October 1991	16.2	21.5	2.2	3.0
May 1992	15.1	19.3	2.3	3.3
October 1992	13.5	17.8	2.5	3.2
May 1993	13.6	17.7	2.9	3.6
October 1993	13.0	16.8	3.2	4.4
May 1994	11.9	16.1	2.6	3.3
October 1994	14.2	19.0	3.0	3.5
May 1995	16.3	22.2	4.3	5.7
October 1995	18.2	24.8	4.4	6.3
May 1996	19.6	26.7	5.1	6.9
October 1996	20.1	27.9	5.5	7.5
May 1997	18.8	26.3	4.1	5.7
October 1997	19.0	26.0	5.0	6.4
May 1998	17.7	24.3	4.0	5.3
October 1998	18.2	25.9	4.5	6.9
May 1999	19.1	27.1	5.4	7.6
October 1999	18.9	26.7	4.8	6.7
May 2000	21.1	29.7	5.3	7.5
October 2000	20.8	28.9	5.6	7.7

We will now focus on the relationship between poverty and several socio-economic characteristics of the household. By way of illustration we present some figures for the second semester of 2000 (based on GBA data) in the following table.

It can be seen that the poor household is bigger than the average household above the poverty line. Members average 4.5 in the first case and 3.0 in the second. This is why the incidence of both poverty and indigence is systematically higher on individuals than on households. This phenomenon is reflected by the gaps between both series in Figures 41 and 42.

Table 32
Characteristics of poor and non-poor households
(second semester of 2000)

Indicators		Total	Poor	Non-poor
Household size (number of members)		3.1	4.5	3.0
Recipients by household		1.4	1.3	1.6
Members under 14 years		0.8	1.7	0.6
Total household income	(*)	$1022	$342	$1320
Per capita household income	(*)	$ 333	$ 76	$ 440
Average income by recipient	(*)	$ 681	$263	$ 825

(*) In constant pesos of May 1998.

A higher participation of people under 14 years is also observed in the poor household: While this ratio is of 0.6 members for non-poor households, it climbs to 1.7 for the poor ones. This figure doubles the general average. *Ceteris paribus*, the factor implies a greater inactivity rate in the poor household and, therefore, relatively fewer sources of income.

Thus, in spite of their larger size, poor households have both fewer income recipients and lower average real incomes than those observed in the non-poor household. This "price effect" is the most important one in relative terms since the non-poor household has an income per recipient that triples the observed average in the poor household. Instead, the differential in the quantity of recipients is minor.

Both effects taken together imply an approximately 400 percent gap in total family income between both groups. However, this gap is even higher when the per capita household income is considered, given that the smaller total income that the poor household obtains has to be distributed among a higher number of members. While the individuals belonging to a poor household receive a monthly income of $ 76 on average, this figure is 6 times higher in the case of the non-poor household.

To complete the characterization of poverty we will now focus on the profile of the head-of-household worker by the type of household she or he belongs to.

The following table shows that head-of-household workers that belong to non-poor households are employed in higher proportion and are less affected by unemployment than those in poor households. Unemployment is strongly correlated with episodes of poverty: Almost 20 percent of the head-of-household workers below the poverty line are unemployed, but this percentage falls to less than 5 percent for the rest of the households. The gap between the respective unemployment percentages surpasses the differences observed regarding occupation. Thus, the net effect is a higher percentage of inactive people in the non-poor household: 27 percent against 21 percent in the other group.

Considering educational levels, the table shows that among the head-of-poor-household workers only 3 percent have a tertiary education. This percentage rises to 25 percent in the non-poor household. In contrast, 70 percent of the head-of-poor-household workers only have a primary education, practically doubling the percentage of the head of the non-poor household. This confirms the relevance of educational levels as determinants of income, income distribution, and poverty. This is, in turn, a consequence of the existing differentials in the returns of education analyzed in previous sections.

Furthermore, we can see that more than a third of the head-of-poor-household workers are involuntarily underemployed, while this percentage falls to 10 percent in the other case. This implies that the gap in total incomes between both groups is not only due to the differential in hourly earnings but also to the number of hours worked.

Table 33
Characteristics of the head-of-household workers
(distribution by categories,
second semester of 2000)

Indicators	Total	Poor	Non-poor
Activity			
Employed	66.7%	60.1%	68.7%
Unemployed	7.9%	19.4%	4.7%
Inactive	25.4%	20.6%	26.7%
Educational level			
Primary	46.1%	70.1%	39.3%
Secondary	33.8%	26.9%	35.7%
Tertiary	20.1%	3.0%	25.0%
Type of occupation			
Full-time wage earner	64.6%	48.8%	68.7%
Full-time non-wage earner	20.1%	16.2%	21.0%
Involuntarily underemployed	15.3%	35.0%	10.3%
Gender			
Male	72.4%	77.6%	70.9%
Female	27.6%	22.4%	29.1%
Age			
Up to 30 years old	11.9%	12.6%	11.8%
31-45 years old	32.1%	39.8%	29.9%
46-65 years old	35.2%	36.7%	34.8%
More than 65 years old	20.8%	11.0%	23.5%

Considering gender, the data show that the household with a female head is less affected by poverty than those headed by a male worker. This is partially because many households with female heads have only one member. However, when only households that have members under 14 years are considered, the incidence of poverty is stronger in households headed by women.

Finally, heads of household under 45 represent 50 percent of the head-of-poor-household workers and 40 percent for the rest of the households. These percentages fall to 11 percent and 23.5 percent for people over 65, respectively.

Briefly, the head-of-household workers of poor households can be characterized by a stronger incidence of unemployment, by a smaller rate of employment and, within the last category, by a smaller participation of full-time workers. At the same time, given that they possess a smaller stock of human capital, head-of-poor-household workers obtain jobs with lower returns and work fewer hours on average. These factors explain their smaller total income. This, in turn, generates a vicious circle of low education and incomes that is reproduced within the household fundamentally affecting the youngest.

Turning back to the analysis of the evolution of poverty in the nineties, we should stress that the first phase in the decade (up to 1994) shows a fall in the incidence of poverty, together with a rising trend in real incomes and a relative stability in income distribution inequality. As we have already mentioned, the initial increase in income in real terms is explained basically by the stability of prices and the economic growth experienced in the first years of Convertibility. This panorama would drastically change in the second half of the decade of the nineties.

The beneficial effects of economic growth on the levels of poverty are evident. However, increments in the average income will cause a fall in the proportion of people

below the poverty line only if these effects are not offset by negative changes in income distribution.

It is interesting, therefore, to decompose the observed changes in poverty by separating the "average income (or growth) effect" and the "distribution effect." The first one is defined as the change in poverty due to changes in the average income with a constant income distribution (the Lorenz curve) of the initial moment. On the other hand, the "distribution effect" quantifies the variations in poverty originated in distributive changes but with a constant average income. We begin expressing the poverty index as:

$$P = P(z, \mu, \sigma),$$

where: z is the poverty line, μ represents the average income and σ designs the income distribution index. Therefore, we can decompose the observed changes in the level of poverty between two different moments as:[41,42]

$$P_t - P_{t-1} = G + D + residual,$$

where G stands for the "average income or growth effect," which is, in turn, obtained as:

$$G = P(z, \mu_t, \sigma_{t-1}) - P(z, \mu_{t-1}, \sigma_{t-1}),$$

and D is the "distribution effect." The latter is defined as:

$$D = P(z, \mu_{t-1}, \sigma_t) - P(z, \mu_{t-1}, \sigma_{t-1}).$$

We estimated this decomposition of poverty changes for two periods. The first goes from the beginning of the nineties to the first semester of 1994. In this phase a strong fall in the incidence of poverty was observed. The second period goes from the second semester of 1994 to the end of the series. The results are presented in the following table.

Table 34
Decomposition of the poverty-index variations (in %)

Period	Total change	Growth effect	Distribution effect	Residual
91-94	-10	-10	-1.3	1.3
94-00	8.9	3.2	6.3	-0.6
91-00	-1.1	-5	4.5	-0.6

We see that the initial fall in the incidence of poverty is almost totally explained by the increment in the real average income in the expansionary phase of the early nineties. In this period, a slight improvement in income distribution also contributed to a reduction in poverty, but with a considerably smaller impact than the "growth effect."

In contrast, in the 1994 to 2000 period both effects acted together to explain a strong increment in the poverty index. However, the distribution effect quantitatively doubles the magnitude of the growth effect. Of the 8.9 percent total increment in the

---

[41] The decomposition is based on Kakwani and Subbarao (1990) and Datt and Ravallion (1990).

[42] The decomposition is not exact due to the existence of crossed effects between both components. Székely (1997) outlines an exact decomposition working with the weight of different periods.

incidence of poverty, 6.3 percent is explained by the increment in income concentration and 3.2 percent by the fall in average income. As was mentioned before, in this period the Gini index of the per capita household income presented a cyclical behavior around a rising trend. On the other hand, the average income also fluctuated in the period with a net fall between its extremes.

Finally, considering the complete period, it can be seen that the effects present opposite signs. The "growth effect" contributed to a reduction in poverty incidence, which is almost totally explained by the increment in real incomes in the first phase in the nineties. In contrast, the "distribution effect" pushed the poverty index upwards, fundamentally after 1994, when a strong worsening in income distribution among households took place.

11. Synthesis and conclusions

The launching of the convertibility regime was a landmark in the nineties in Argentina. The program finally collapsed ten years later at the end of 2001. Thus, the decade can be identified with a macroeconomic regime that was also based on a redefinition of the public and private spheres of economic activity (through an intense privatization process of public-owned firms), trade and financial opening and, at a more general level, a clear market-friendly orientation.

From a macroeconomic standpoint, two neat cycles can be observed in the period. The outstanding and early success of price stabilization came together with a lengthy five-year expansion and a subsequent short recession in 1995. A new and briefer recovery followed, and then a new recession began from mid-1998. The latter happened to be an unusually long contractionary period, a true depression, encompassed by a slight declining trend in nominal prices. This phase concluded with the final crisis of the monetary regime of the nineties.

Capital flows had a crucial role in the short-run macroeconomic dynamics of the period through their impact on interest rates, internal liquidity, and aggregate expenditure. In the early nineties, the net capital inflows surpassed the current account deficit, thus allowing for a significant accumulation of foreign reserves while feeding domestic credit creation and the economic recovery. In this way, they made the achievement of a double target possible: price stabilization and output growth. In contrast, significant capital outflows would later trigger the recession of the mid-nineties. Renewed inflows (following the same pattern of the initial period) gave impulse to the next recovery. A worsening of the international context after the crises of Southeast Asia in 1997 and Russia in 1998 would stop the economic expansion and trigger the second recession in the decade. Later, the closing of access to foreign credit would determine the collapse of the regime.

In this paper we have examined and pointed out the close relationship between fluctuations in capital flows and the domestic cycle of economic activity under the convertibility framework. In this institutional context, changes in the international conditions regarding liquidity and credit availability have an immediate impact on the domestic interest rates, on the supplies of money and credit and, thus, on the short-run macroeconomic performance. This is a particularly disadvantageous feature, taking into account the evident volatility of international capital movements.

The two afore-mentioned cycles had a counterpart in the labor market. They also impacted on distributive indicators and on poverty and indigence levels.

In effect, exchange-rate based stabilization processes like the Argentine one in the early nineties, which also involve a simultaneous trade opening, privatization, and fiscal adjustment, tend to generate a characteristic dynamics that could also be observed in other national experiences.

In the labor market we can see, typically, the development of a cycle in employment and distribution. In the period under scrutiny here, both the employment levels and the average real incomes initially grew. However, in the ensuing contractionary phase, those initial effects weakened and a number of negative factors became dominant. We refer to the persistent consequences of the combination of trade opening and exchange-rate appreciation; later on, the reversion of aggregate expenditure's rising trend acted in the same direction.

Therefore, the rate of full-time employment to population, for instance, after having increased from 1991 to 1992, started to fall to a new bottom in 1996, well below its 1990 level. Note that the ratio of the number of employed individuals to the total population began to decline (and the unemployment rate to rise) well before the turning point of the economic expansion of the beginning of the decade. This reveals a serious weakness of the economy to create employment, and specially full-time jobs in the new conditions.

The average earnings and the employment rate rose again in the second cycle of the nineties, to decline once more from mid-1998, but without nearing the levels attained in the preceding peak. By the end of the period, for instance, the average real incomes of the employed individuals were almost 11 per cent lower than the 1994 level. And the full-time employment ratio was about 2.7 percentage points of the population lower in 2000 than the 1992 peak. Meanwhile, the unemployment rate increased by 3.87 p.p. in the same period (according to GBA figures).

We have argued that the contractionary adjustment of employment in the nineties can be understood as a gradual adaptation to the new conditions (of trade opening and relative prices, in particular) set at the beginning of the decade. An increased competition of imported goods, on the one hand, and a strong upswing in the ratio between the average wages and the cost of capital goods (as reflected by the average wage measured in US dollars, which rose abruptly in 1990-91), on the other hand, explain a significant drop in labor demand by firms.

The estimated coefficient of structural adjustment of full-time employment would explain, in fact, a fall in this ratio equivalent to 10 percentage points of the population between 1990 and 1996 (about 1.44 p.p. a year), though this effect was partially offset by the increase in labor demand caused by GDP growth. The empirical evidence suggests, however, that the aggregate employment adjustment process to the conditions set at the beginning of the nineties could be considered complete by late 1996.

The text also shows that, although both the privatization process and the fiscal adjustment had some negative impact on employment, the dominant negative effects came from the restructuring and concentration of economic activity in the tradable sectors, particularly in manufactures, as was observed in the cases of Brazil and Mexico.

We also concluded that, unlike what was observed in the aggregate, the adjustment process of full-time employment in manufactures cannot be considered complete about 1996. To the contrary, the falling trend is as strong in the second half of the decade as it was before, if measured by the number of hours worked (instead of the number of jobs). However, this behavior was not dominant on aggregate employment as a consequence of the lower weight of the industrial sector in the total number of workplaces in recent years.

Even in expansionary periods, the increases in the demand for manufactured goods could not offset a number of negative effects. The latter resulted from the direct displacement of domestic production for imported goods and from the reduction in the

number of jobs per output unit in the surviving firms, as an adaptation to the new set of relative prices. Furthermore, many small and medium-sized firms found serious difficulties to continue operating. Their closing was an important cause of employment contraction.

We also examine the evolution of employment and incomes according to different categories of workers and jobs. Note, for instance, that the decline in full-time employment hit male and head-of-household workers in higher proportion, and specially in manufactures.

Female and secondary workers saw their employment rates lowered in this sector, too. But both groups increased their presence (measured as percentages of the population) in full-time jobs in other sectors. Therefore, their participation in aggregate full-time employment changed only slightly.

In spite of the decline in the full-time employment ratio, total employment, including the underemployed, rose by 1.09 p.p. between the extremes of the period. This reflects the fact that involuntary underemployment (which showed a counter-cyclical behavior as well as a rising trend in the nineties) increased by more than 3 p.p. in the decade. Female and secondary workers explain the rise in aggregate employment, while male and head-of-household workers had an important negative contribution.

The average real incomes of the employed individuals rose during the expansionary phase of 1991-94, as did the active population's average earnings. But the increase was lower for the second, reflecting the impact of unemployment rates that started to rise in this period in spite of a still growing output.

Income distribution indicators estimated for both households and employed individuals improved slightly in this initial period. The incidence of poverty showed an important fall from the record levels related to the hyperinflationary phase of 1989-90. However, the behavior of indigence was different: after an initial reduction, it started to climb early on, while the economy was still in the middle of an economic expansion.

This panorama seriously worsened from 1994. Average real incomes of both the employed workers and the active population fell strongly, in particular for the latter (as a consequence of the simultaneous impact of lowered wages and a higher unemployment rate).

The estimated distributive indicators suffered a generalized and significant deterioration in the mid-nineties. The household's Gini index, for instance, showed an impressive upswing, as happened in the cases of the employed workers and, even more intensely, of the active population.

The rising unemployment rate is the main factor to explain the deterioration in these income-distribution indexes. Unemployment affects income distribution in a number of ways: One is direct, by diminishing the number of income recipients among active persons. As the contraction in the number of jobs hits the lowest-income households more intensely, unemployment was not neutral with regards to income distribution among households. Meanwhile, considering the educational levels of the population, we see that unemployment affected the less educated workers in higher proportion, and these had a stronger presence in the lowest-income households.

But the upswing in unemployment also has an indirect impact on labor earnings and distribution. It causes a decline in the hourly earnings of both full-time and underemployed workers. The paper shows, in fact, that the elasticity of both hourly and total real earnings of the employed workers to unemployment is negative and statistically significant. It also proves that the unemployment rate has a negative effect on the number of hours worked for the underemployed too. Furthermore, the unemployment-elasticity of income is higher for the underemployed than for full-time workers. As the incidence of underemployment is

higher in the lowest-income households, these effects had negative consequences on income distribution.

The estimated unemployment-elasticities of workers' earnings are very close to their values for the United States and for other developed economies. This suggests that the observed upswing in unemployment and underemployment cannot be attributed to a particularly strong downward inflexibility of wages. From 1998, for instance, average earnings showed some fall, in a context of a slight negative trend of nominal prices, without any significant positive effect on the employment levels. To the contrary, it is possible that these factors had a bearing on an even greater excess of supply in the goods markets, thus reinforcing the depressed situation of the labor market. On the one hand, lower earnings have a negative impact either on aggregate demand or on some components of it. On the other hand, a price deflation increases the level of debts in real terms, and this can also have a negative effect on aggregate expenditures, through its impact on debtor's spending propensity.

An intermittent procyclical fiscal policy (not always confirmed by ex post figures) added to these depressive factors in recent years, and particularly from late 1999, when the public-sector access to foreign credit became increasingly difficult. The economic penury had another manifestation in the lack of policy instruments to help the economy to emerge from the scenario of depression and price deflation.

Considering the different educational levels of the employed population, the elasticity of hourly earnings to unemployment falls as the educational formation of workers increases. In particular, the response of tertiary-level educated workers' earnings to unemployment is considerably lower to that of less-educated groups. This sector was also less affected by the unemployment upswing in the nineties.

After a deterioration by the mid-1990s, the estimated income-distribution indicators evidenced a moderate improvement in the ensuing expansion between 1996 and 1998. But they never reached the 1994 levels, before the Tequila episode. During this phase the average incomes of both the employed workers and the active individuals rose, but without reaching the preceding peak. After 1998, and following the spillover of the Russian crisis, the macroeconomic performance clearly worsened.

Even if it is true that the effects of the exchange-rate appreciation (combined with trade opening) had been a crucial determinant in the behavior of labor indicators at the beginning of the nineties, other factors assumed a dominant role in the second half of the decade. They are also a result, in part, of the exchange-rate appreciation. We refer in particular to the negative effects that result from the accumulation of foreign debt, which was, in turn, a consequence of the sustained deficits in the current account of the balance of payments in the nineties.

The debt overhang is another constraint to growth that reinforces the negative effect of the low profitability of firms in the tradable sectors. The combination of higher financial fragility with an unfavorable shift in the international scenario led to a significant decline in private capital inflows from 1998. The accumulation of foreign reserves stopped, negatively impacting on domestic liquidity and on the interest rates. A new economic contraction followed, as well as a decline in average real earnings of both the employed workers and the active persons. These new trends could still be observed until the end of the decade.

Indigence and poverty indicators also resumed a rising trend in 1998-2000. Thus, poverty almost completed its return to the 1991 levels, while indigence showed a worsening between the beginning and the end of the decade.

The results of this study make it possible to trace an end-of-period panorama that happens to be the scenario preceding the outburst of the crisis, whose consequences will

certainly include an additional worsening of labor conditions and income distribution indicators.

In synthesis, this panorama can be traced with the following elements that compare the end of period with its beginning. The full-time employment rate (for the urban population) fell by 1.8 p.p., basically explained by the behavior of the manufacturing sector and, in particular, by lower proportions of male and head-of-household workers in this kind of job. However, the proportion of involuntarily underemployed persons rose strongly (by more than 3 p.p.). As a consequence, the employment rate (including the underemployed) increased by slightly more than one percentage point of the population. The only sector to generate a relatively important number of full-time jobs was financial services.

The proportion of active individuals in the total population followed a sustained upward trend. This ratio increased by about 1 p.p. every three years in the nineties, mainly as a result of the behavior of female participation rates.

A weak employment creation, together with the rising trend in the number of active individuals, explain the important upward shift in the unemployment rate. It passed from 6.3 per cent of the active population at the beginning of 1991 to 14.7 per cent by late 2000.

On the other hand, the per capita real income of the employed was almost 9 per cent higher by the end of the period. But it was almost the same for the active population (only 1 per cent higher, according to the estimation presented in the text). This is because of the afore-mentioned upward shift in the participation rates, which largely surpassed the increase in the rate of total employment.

Although the average earnings of the employed workers rose (by less than 10 per cent), their distribution worsened considerably according to the several indicators we have analyzed in the text. This is due in part to the distributive effects of the rise in the unemployment rate.

When different categories of workers are considered, a decline in full-time jobs can be observed (in particular for wage earners), and an important increase in involuntary underemployment results as a counterpart. The participation of female workers in the labor force also rose, as happened with those with a tertiary-level education. The same can be said of the workers with secondary-level education, but in lower proportion, while those with only primary-level education lost ground. These trends in employment figures closely followed the changes in the educational levels of the total population. An important increase in the returns of education can also be observed in the period.

Distribution indicators like the household's Gini index, as well as those for poverty and indigence, showed markedly rising trends in all cases (beyond a cyclical behavior that resembles that of output). We can mention, as an example of the results of these trends, that the income of the richest decile of households was 40.3 per cent of total income in 2000, while it had been only 35.3 per cent in 1991. This income was equivalent to 23.6 times the total earnings of the lowest-income decile of households in 1991. This ratio had jumped to 38 times in 2000.

As surprising as this may appear to an outsider, note that this dramatic impairment in labor indicators and in income distribution was not the result of the final crisis of the macroeconomic regime of the nineties in Argentina, but anteced it.

Bibliography and references

Altimir, O. and L. Beccaria. "El mercado de trabajo bajo el nuevo régimen económico en la Argentina," <u>Serie Reformas Económicas</u>, 28, Cepal, Santiago, Chile, 1999.

Altimir, O. and L. Beccaria. "Distribución del ingreso en la Argentina", in: Heymann, D. and B. Kosacoff (eds.), <u>La Argentina de los Noventa</u>, Buenos Aires: EUDEBA-CEPAL, I, 2000.

Altimir, O. and L. Beccaria, "Efectos de los cambios macroeconómicos y de las reformas sobre la pobreza urbana en Argentina," Buenos Aires, PNUD, 1998.

Beccaria, L., V. Esquivel and R. Maurizio. "Desigualdad y polarización del ingreso en Argentina," Universidad Nacional de Gral. Sarmiento, 2001.

Beccaria L., and R. Maurizio. "Movilidad laboral e inestabilidad de ingresos en Argentina," Universidad Nacional de Gral. Sarmiento, 2001.

Blanchflower, D.G., and A.J. Oswald. <u>The Wage Curve</u>,The MIT Press, Cambridge, 1996.

Damill, M. "El balance de pagos y la deuda externa pública bajo la convertibilidad," <u>Boletín Informativo Techint</u>, 303, Buenos Aires, 2000.

Datt, G. and M. Ravallion. "Growth and redistribution components of changes in poverty measures. A decomposition with applications to Brazil and India in the 1980s," <u>Journal of Development Economics</u> 38. North Holland, 1990.

Esteban, J. and D. Ray. "On the measurement of polarization," <u>Econometrica</u>, 62, Nº 4, 1994.

Esteban, J., C. Gradín and R. Debraj. "Extensions of a measure of polarization with an application to the income distribution of five OECD countries," <u>Documento de Trabajo</u> 24, Instituto de Estudios Económicos de Galicia- Pedro Barrié de la Maza,1999.

Frenkel, R. and M. González Rozada. "Apertura, productividad y empleo. Argentina en los '90," <u>Serie Documentos de Economía</u>, 9, Universidad de Palermo-Cedes, Buenos Aires, 1998.

Frenkel, R. and M. González Rozada. "Argentina: Balance of Payments Liberalization, Effects on Growth, Employment and Income," in: Lance Taylor (Ed.), <u>External Liberalization, Economic Performance and Social Policy</u>, Oxford University Press, 2000a.

Frenkel, R. and M. González Rozada. "Tendencias de la distribución de ingresos en los años noventa," <u>Serie Documentos de Economía</u>, 16, Universidad de Palermo-Cedes, Buenos Aires, 2000b.

Gasparini, L. "Un análisis de la distribución del ingreso en Argentina en base a descomposiciones," <u>Mimeo</u>, Buenos Aires, 1999.

Howell, D., M. Duncan and B. Harrison. "Low Wages in the US and High Unemployment in Europe: A Critical Assessment of the Conventional Wisdom," <u>CEPA Working Paper Series I</u>. Working Paper 5, 1998.

Kakwani, N., and K. Subbarao. "Rural poverty and its alleviation in India," <u>Economic and Political Weekly</u>, 25, A-A16, 1990.

Székely, M. "Explaining changes in poverty: some methodology and its application to Mexico," Banco Interamericano de Desarrollo, 1997.

Appendix: Figures

Figure 1
Seasonally adjusted output and
the Hodrick-Prescott trend
(Quarterly data in logs, at constant 1993 prices)
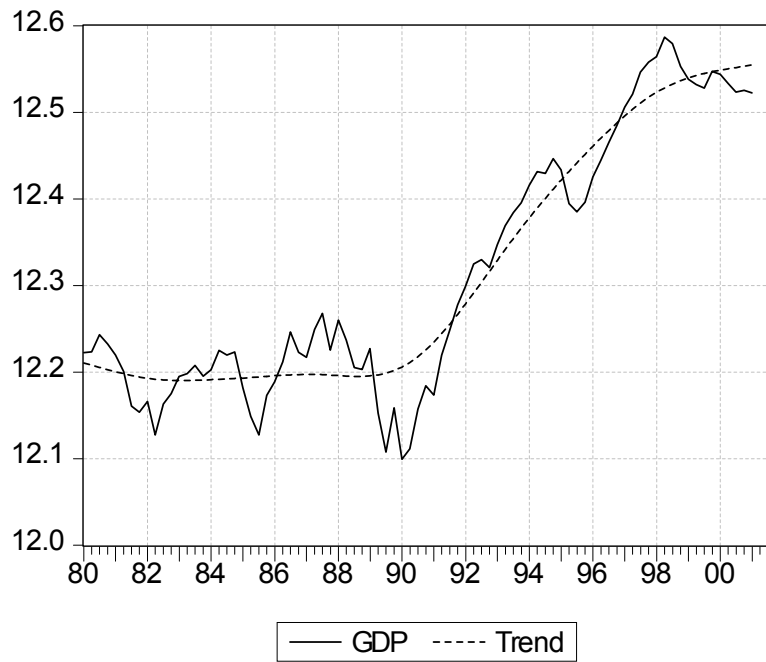
Figure 2
Domestic absorption minus GDP
(% of GDP at constant 1993 prices)

Figure 3
Detrended real ouput (in logs) and trade balance
(in millions of constant 2000 US dollars)

Figure 4
Exports and imports at constant 1993 prices
(as a proportion of real GDP)

74
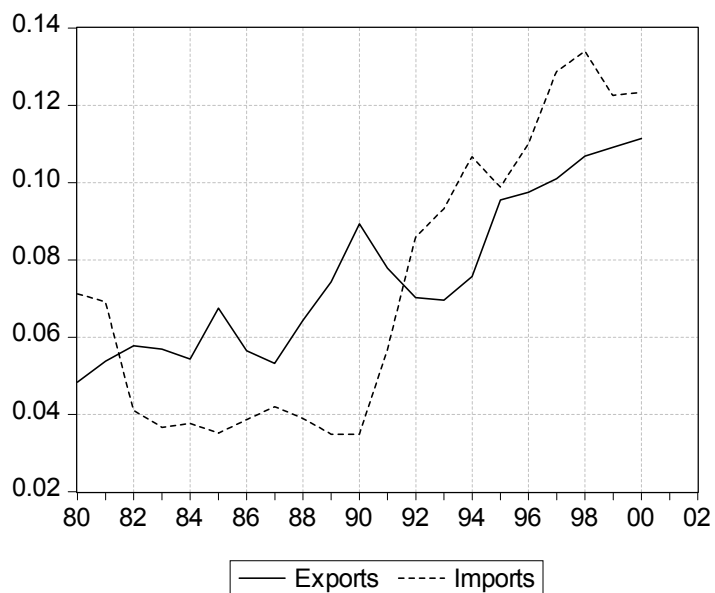
Figure 5
Current account of the balance of payments: net investment income payments
(quarterly data in millions of constant 2000 US dollars)

| | Total net payments | ----- Net interest payments |
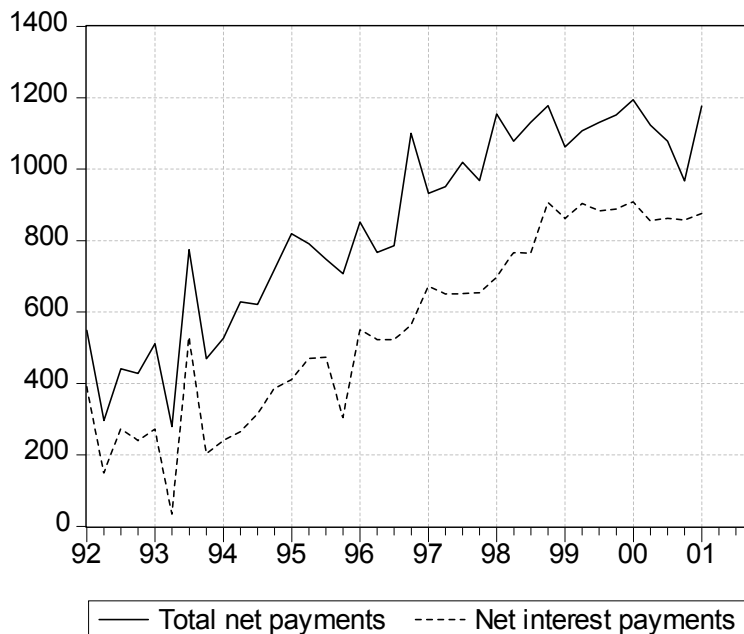
Figure 6a
Balance of payments: current account, net capital inflows and variation of the stock of reserves
(quarterly data, in millions of current US dollars)

—— Current account   ----- Net capital inflows   ———· Accumulation of reserves
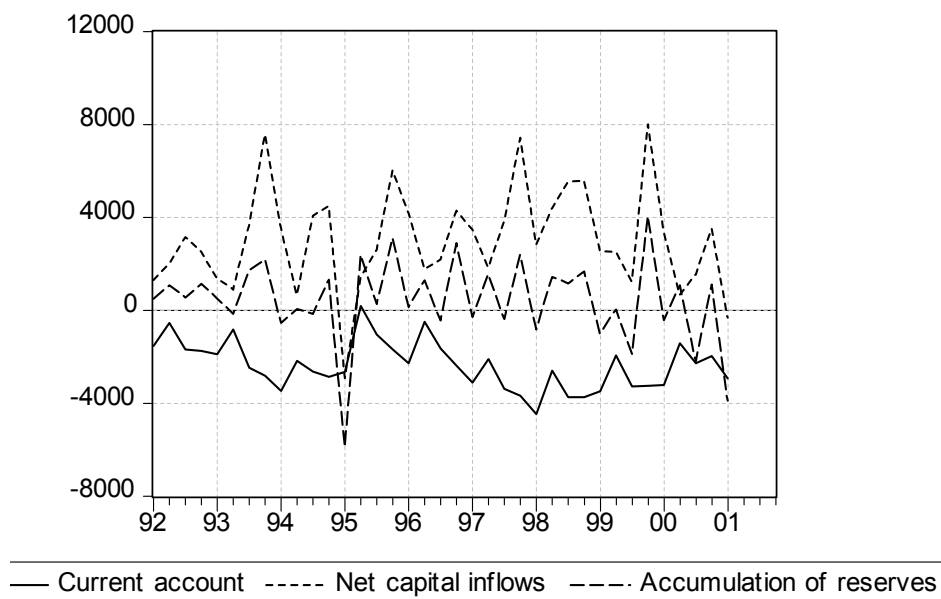
Figure 6b
Balance of payments: current account, net capital
inflows and variation of the stock of reserves
(moving averages of four quarters
in millions of current US dollars)
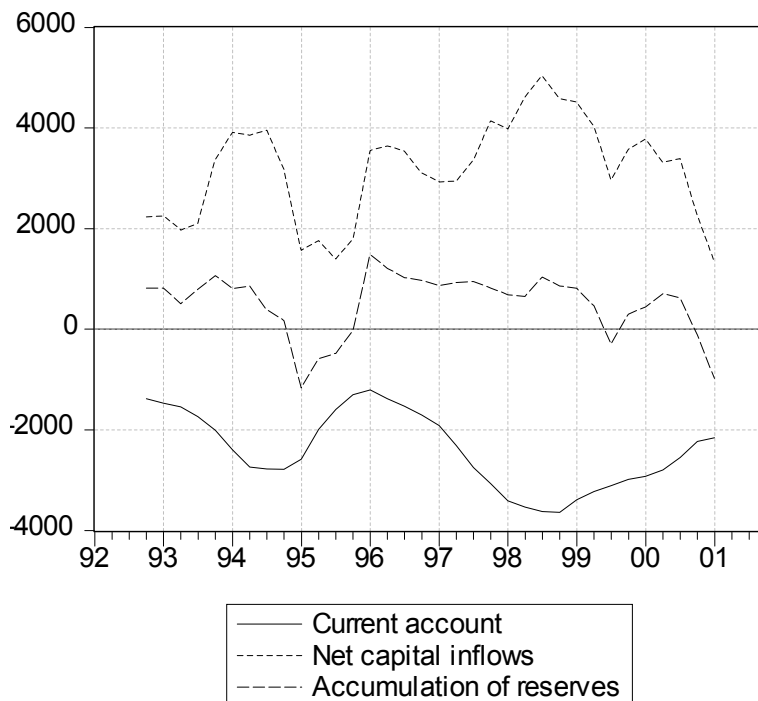
Figure 7a
Balance of payments: Net capital inflows by sector
(quarterly data in millions of current US dollars)
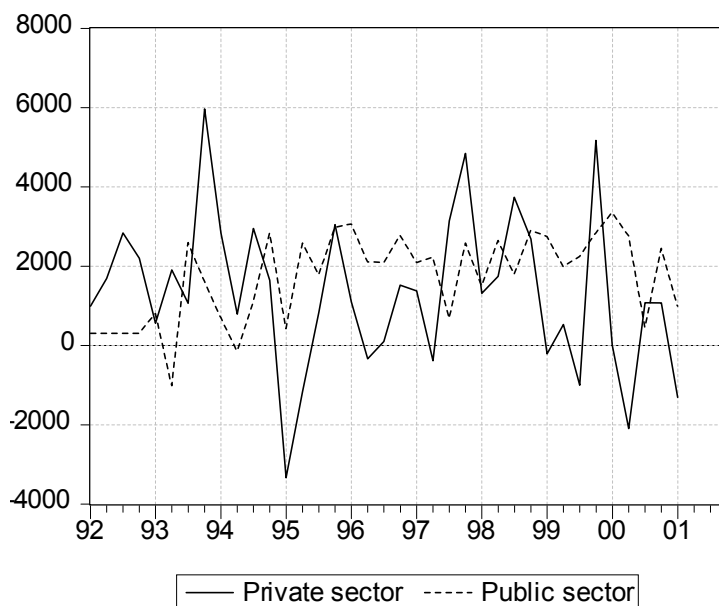
Figure7b
Balance of payments: Net capital inflows by sector
(moving averages of four quarters
in millions of US current dollars)
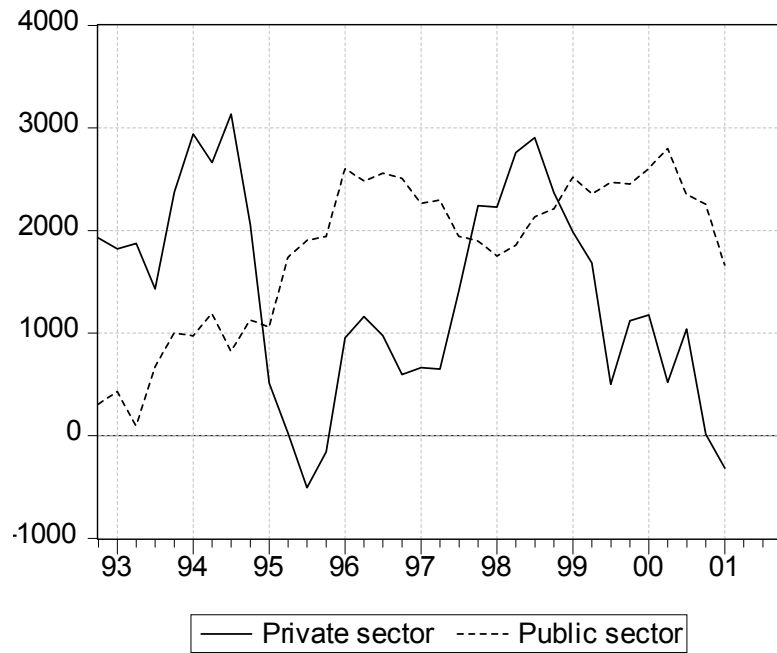
Figure 8a
Average country-risk premium (%) and
net private capital inflows
(quarterly averages per year
in millions of current US dollars;
2001:first quarter)
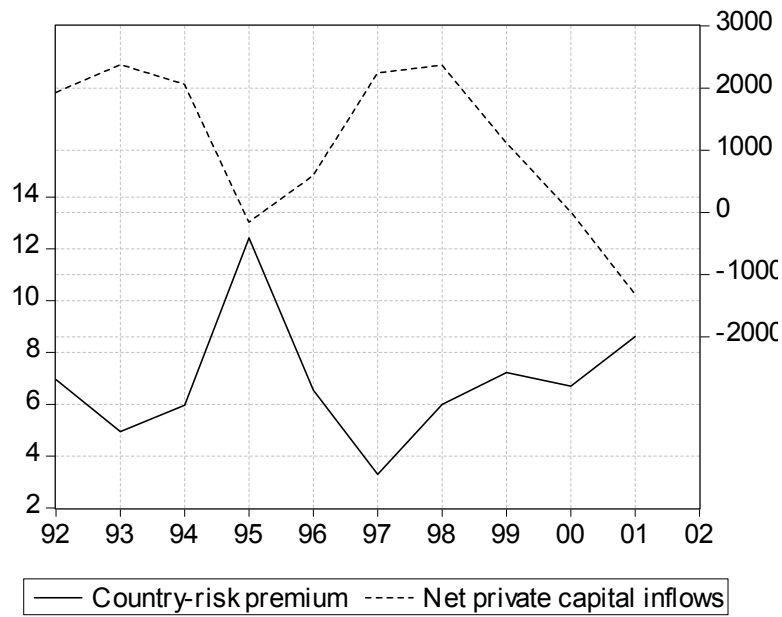
Figure 8b
Country-risk premium in the nineties
(quarterly averages of annual rates, in %)
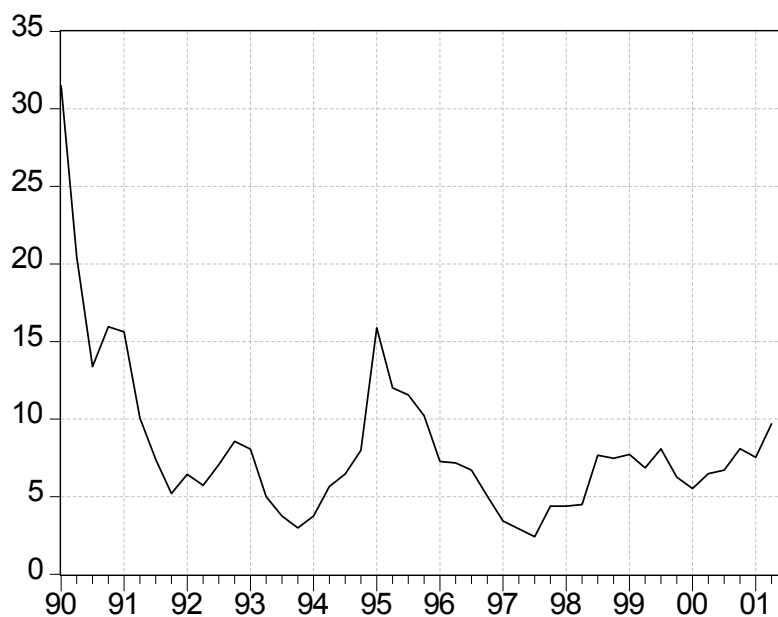
Figure 9a
Financial deepening:
Evolution of broad monetary assets, domestic credit
and foreign reserves of the monetary system
in real terms (deflated by CPI; 1991=1)
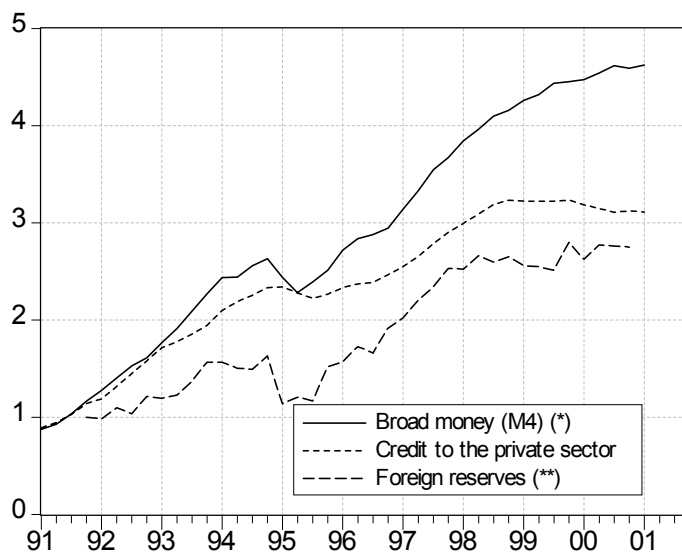
(*) Including dollar-denominated deposits in the
domestic banks.
(**) Reserves of the Central Bank and the domestic
banks, excluding government deposits in the Central
Bank.

Figure 9b
Financial deepening:
US$ denominated domestic deposits and credit
as percentages of total domestic deposits and credit
(end of period)
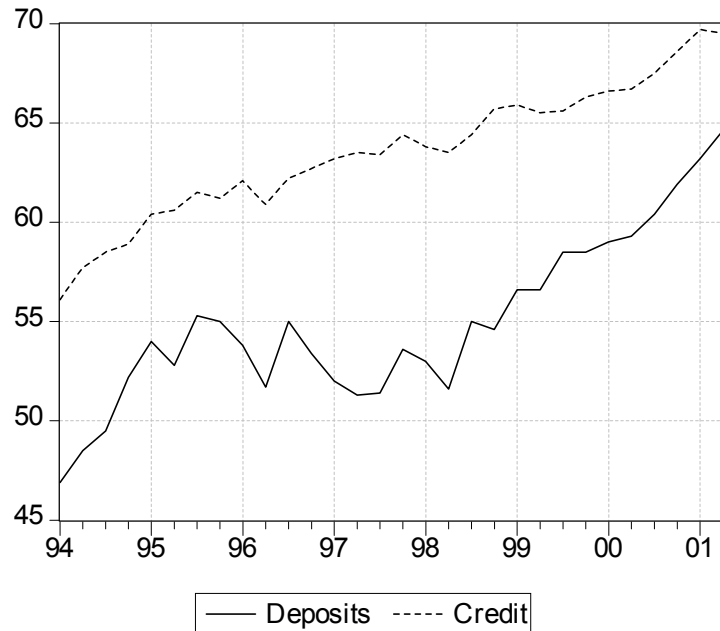
Figure 10
Foreign debt, total and public
(in percentages of GDP at current prices)
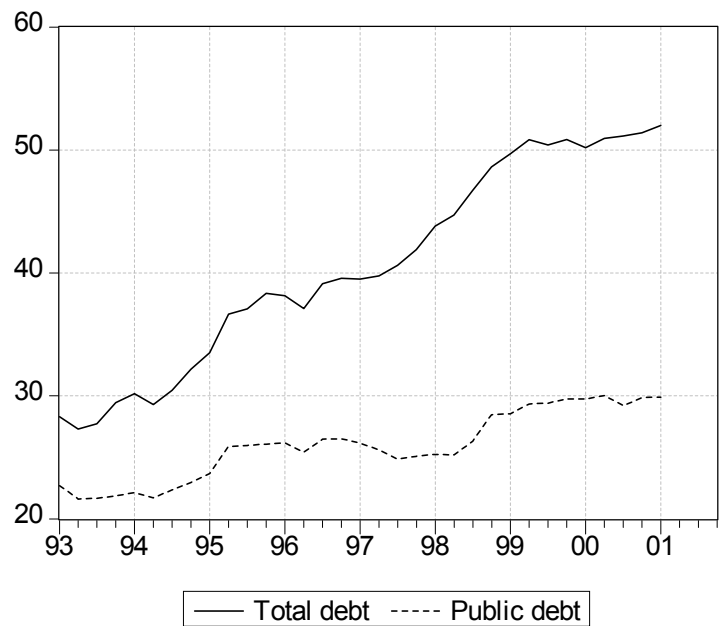
Figure 11
Quarterly rates of inflation (%)

CPI ----- WPI
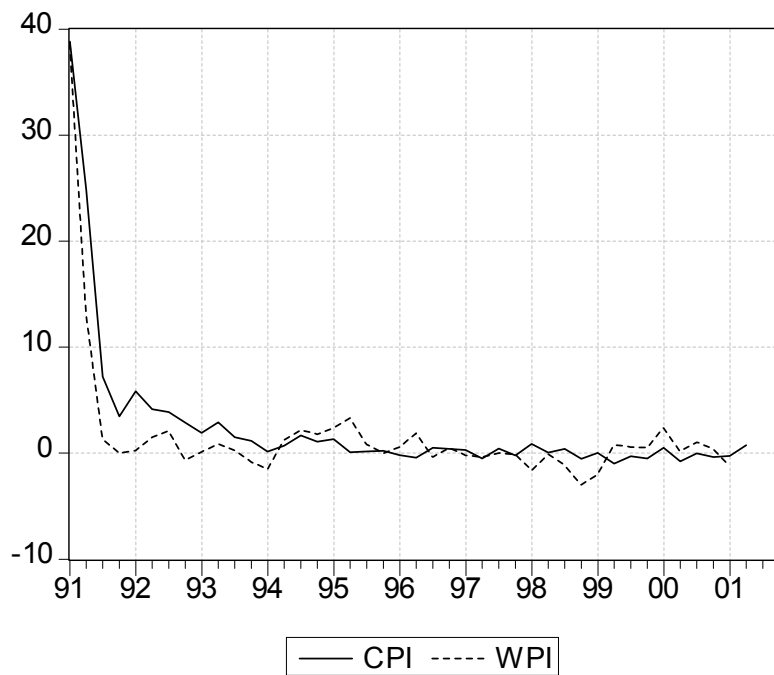
Figure 12
Ratio between domestic and foreign prices
(1991=1)

CPI/US-CPI ----- WPI/US-CPI
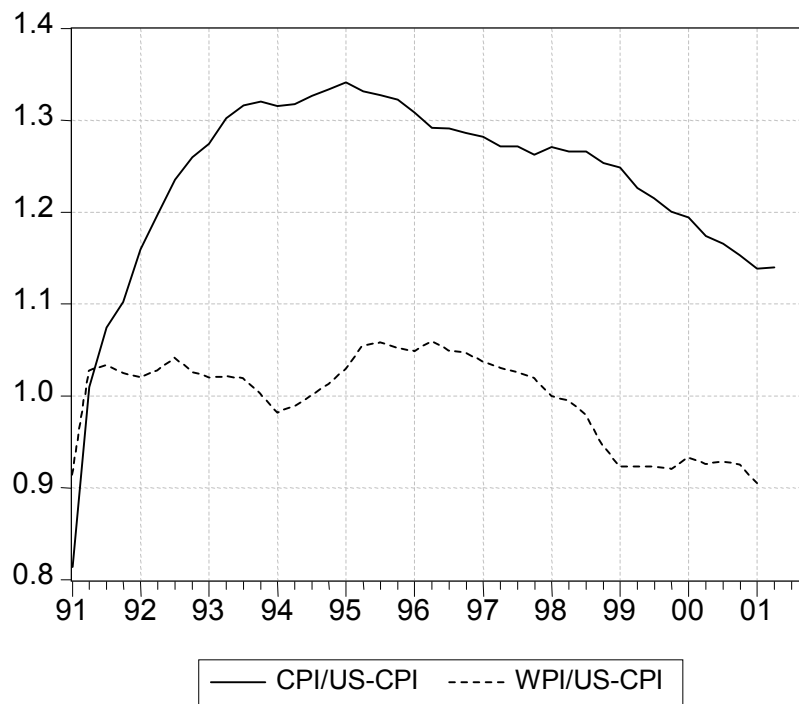
Figure 13
Real exchange rate
(Nominal exchange rate times US-CPI, deflated
by domestic CPI; second semester 1986=1)
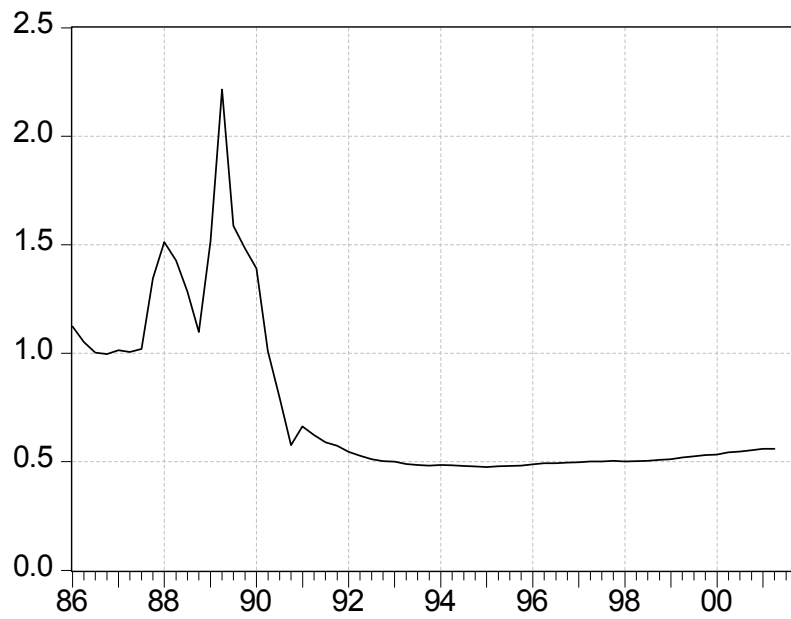
Figure 14
Average real wage in manufactures (deflated
by CPI) and average wage in constant US
dollars (second semester 1986=1)

——— Real wage   ----- Wage in constant US dollars

Figure 15
Consumption and investment
in percentages of GDP at constant 1993 prices
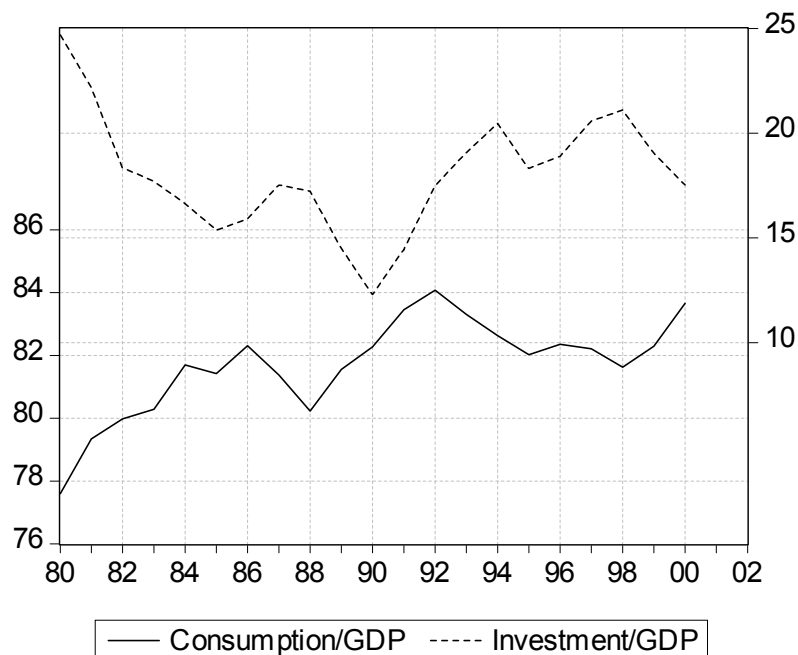
Figure 16
Result of the public accounts
(% of GDP at current prices)

(*) National administration plus provinces and
the City of Buenos Aires
(**) Provinces and City of Buenos Aires
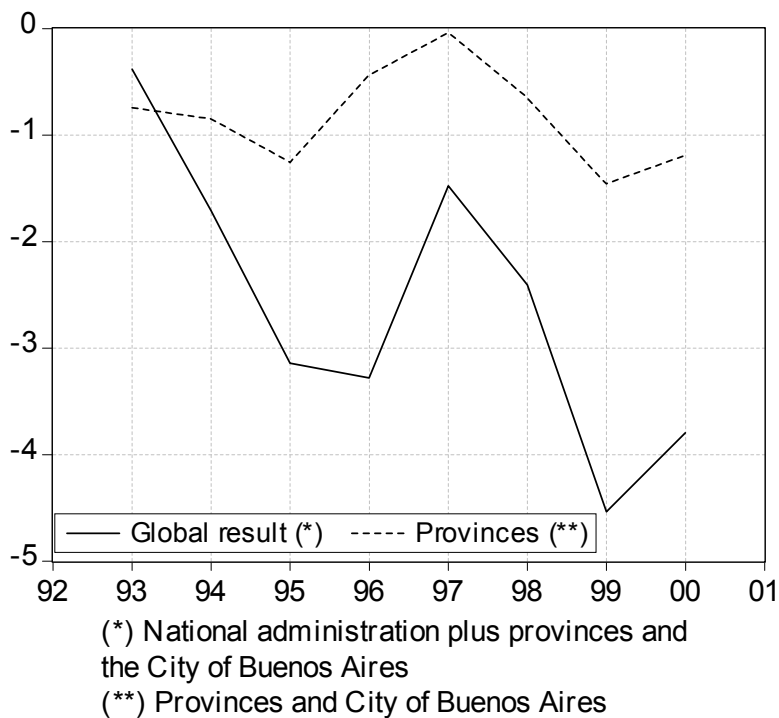
Figure 17
Labor-market indicators:
Participation rate (PART), total employment rate (EMPL),
full-time employment rate (FTEMPL)
and their Hodrick-Prescott trends
(% of total urban population)
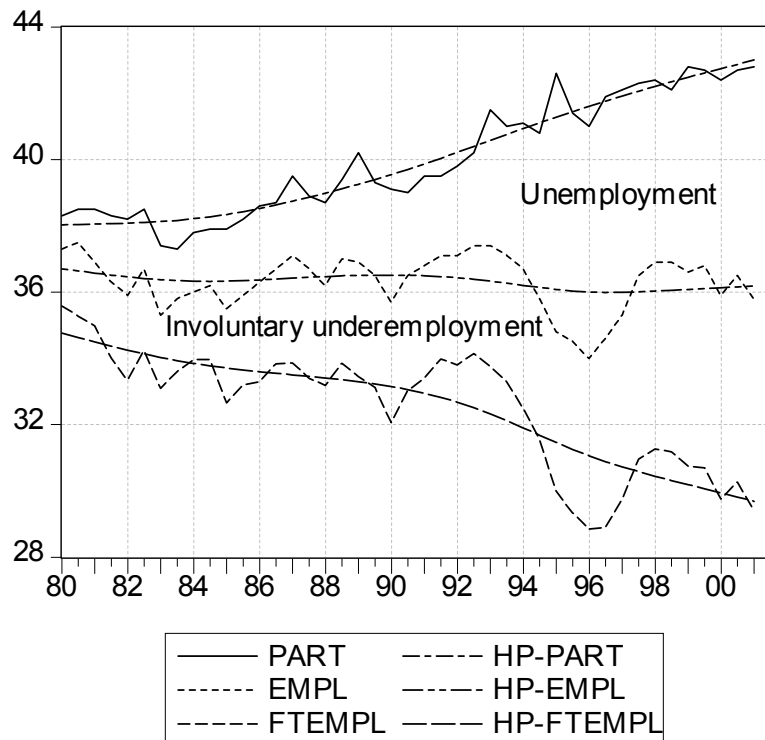
Figure 18
Unemployment (U) and
involuntary underemployment (SUB) rates
(% of the active urban population)
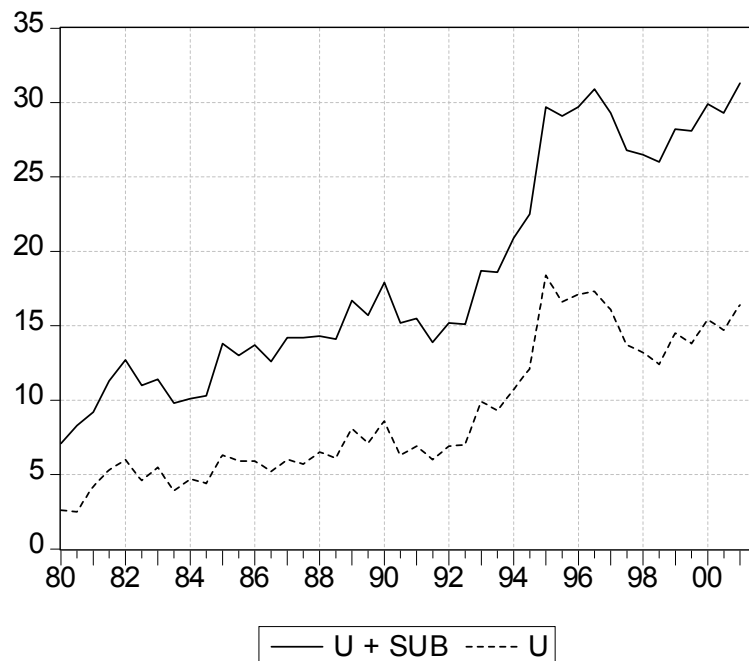
Figure 19
Full-time employment rate and
seasonally adjusted GDP at constant prices
(1990:1 = 1)
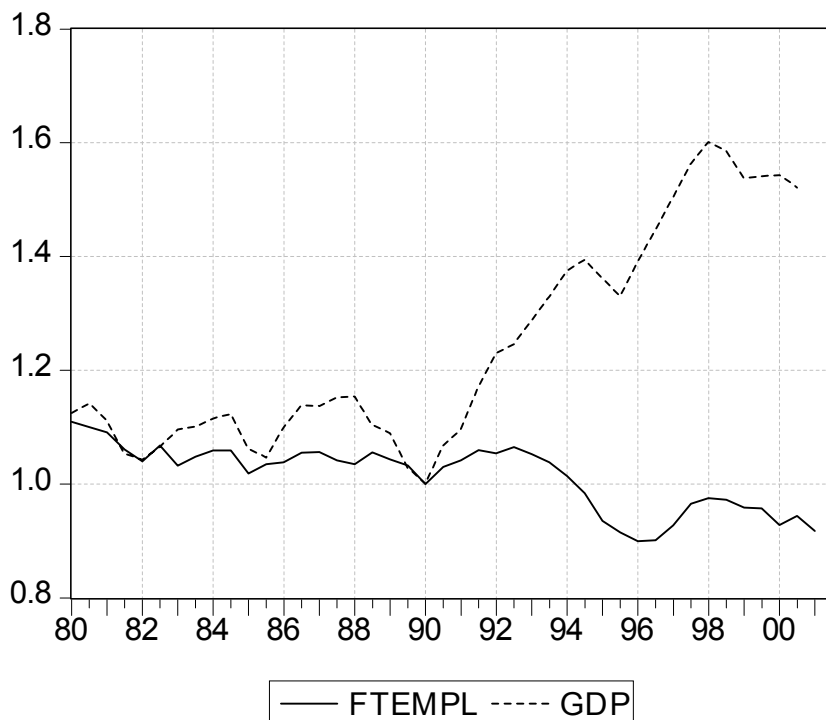
Figure 20
Ratio of GDP to full-employment rate
(1990:1 = 1)
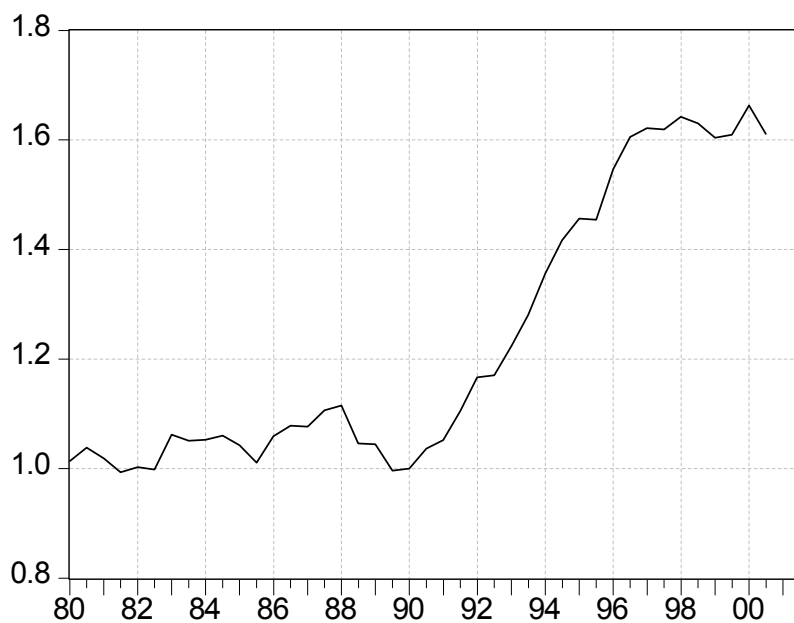
Figure 21
Employment and output in manufactures
(1993=100)

(*) Physical volume of output.
(**) In number of workers
(***) Total hours worked by period

——— Output (*)   ------ Occupation (**)   ––––– Hours of work (***)
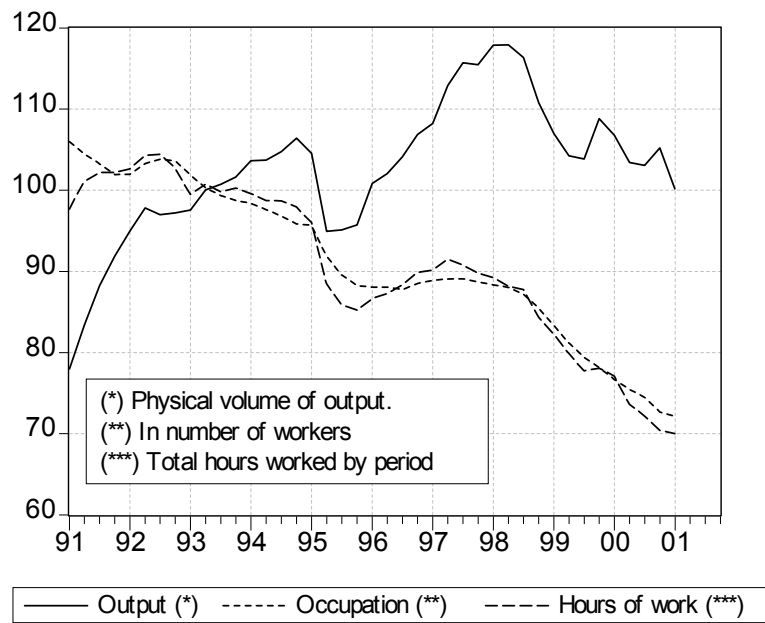
Figure 22
Proportions of GBA population (%)

Rate of employment

Rate of full-time employment

Rate of involuntary underemployment

Rate of voluntary underemployment
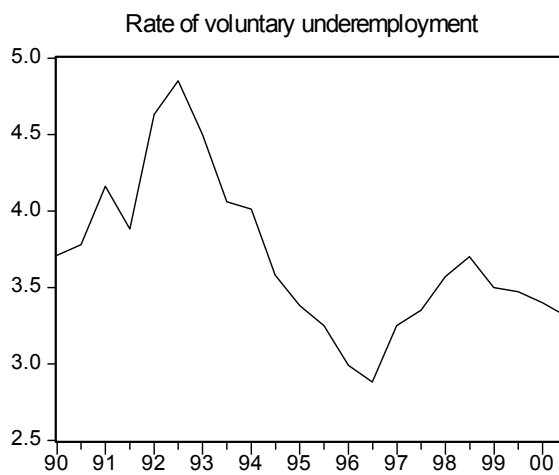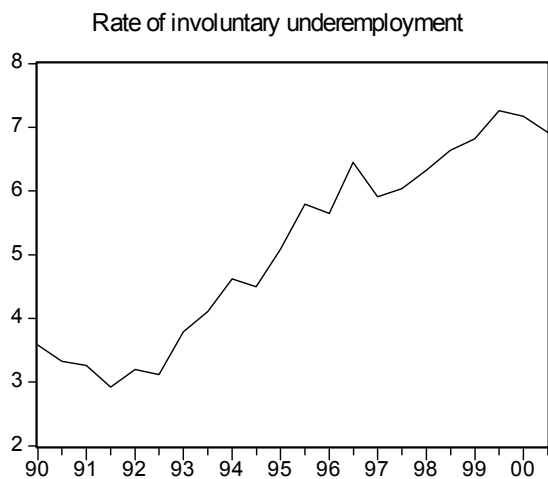
Figure 23

Rate of employment by category of worker
(proportions of GBA population)
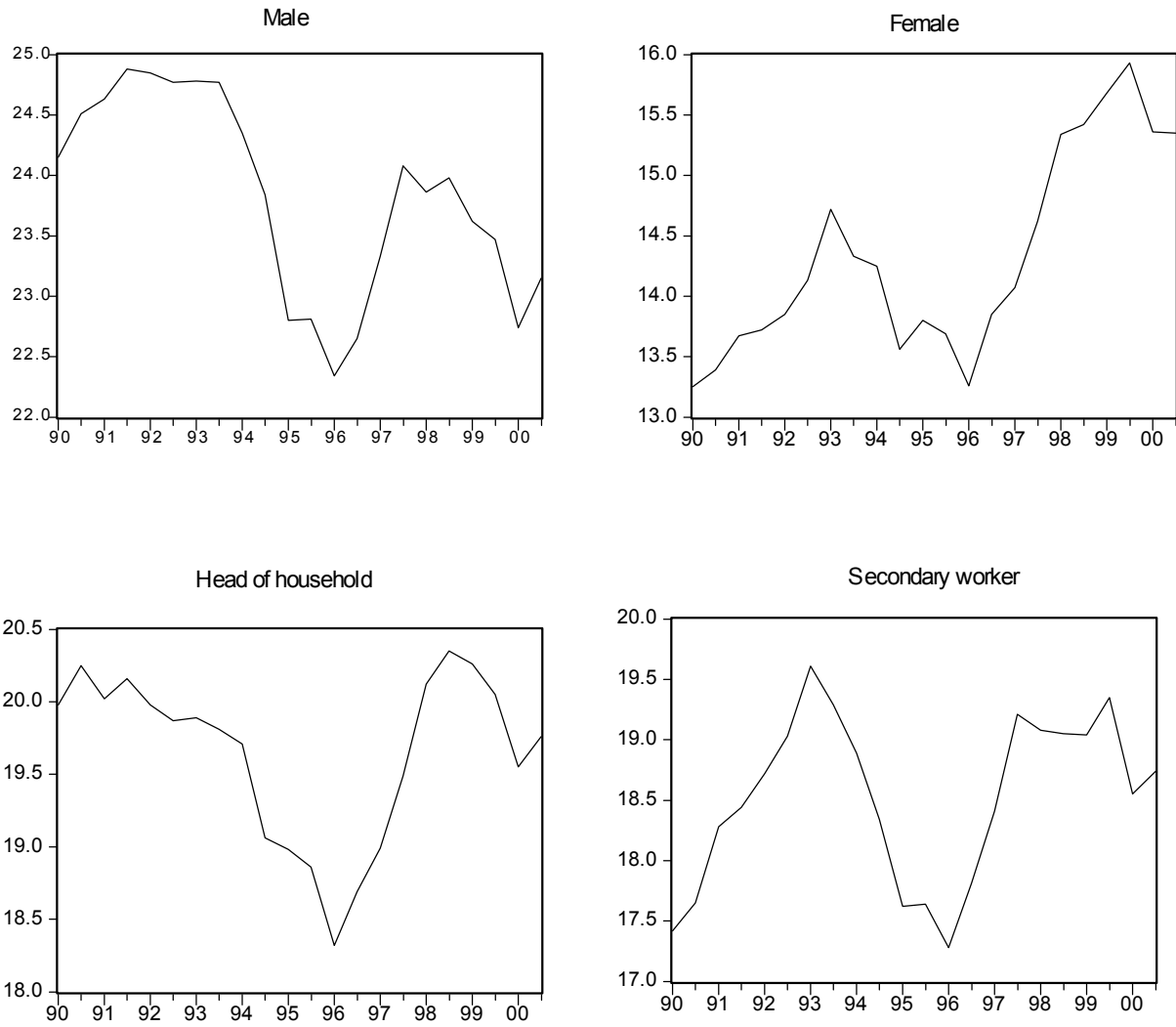
Figure 24
Income of the employed workers
and the active population
(In constant May 1998 pesos)

Figure 25
Gini index of per capita household income

Figure 26

Gini of the active population and unemployment rate (GBA)

Figure 27

Gini and Theil indexes. Employed

Figure 28
Gini and Theil indexes. Active population
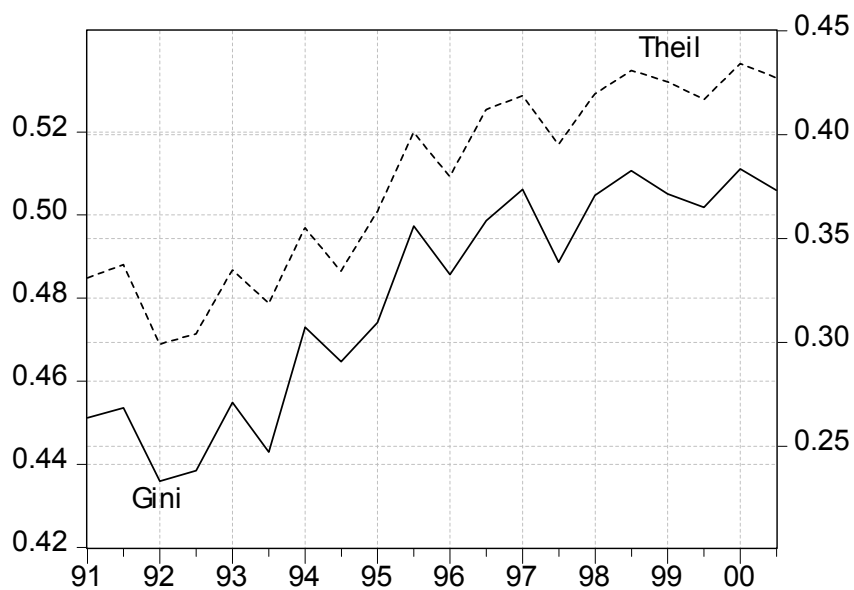
Figure 29
Gini indexes
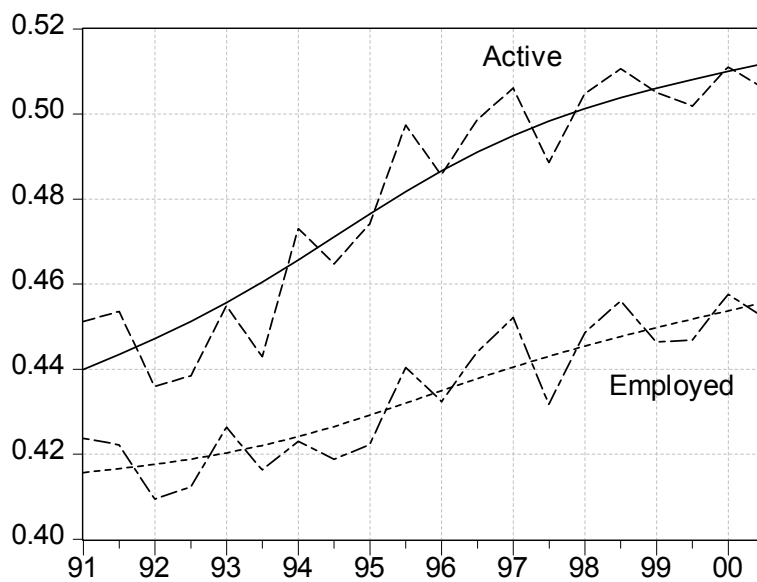
Figure 30
Theil indexes
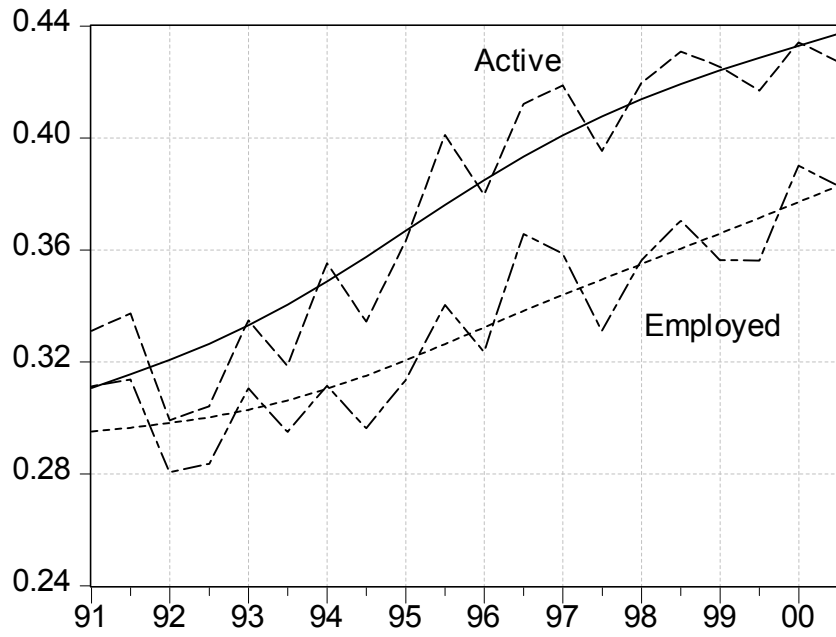
Figure 31
Structure of employment by type of occupation (%)
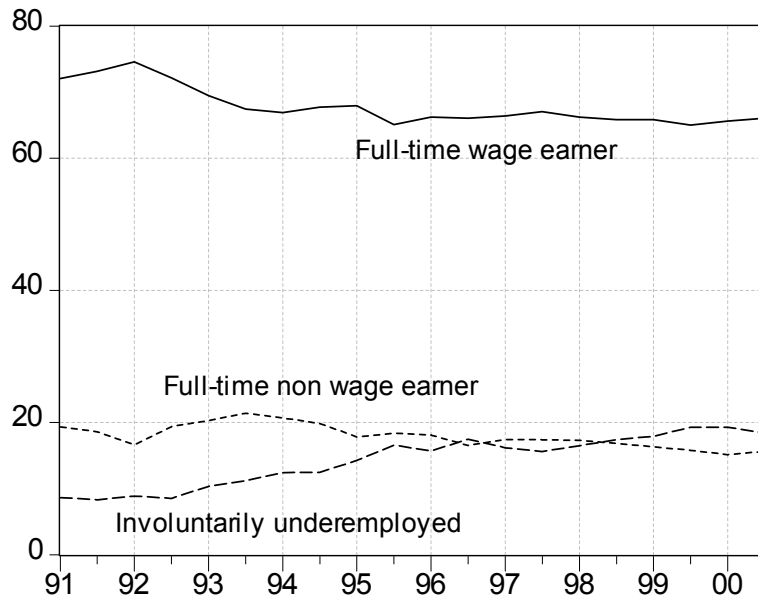
Figure 32
Income by type of occupation
(In constant May 1998 pesos)
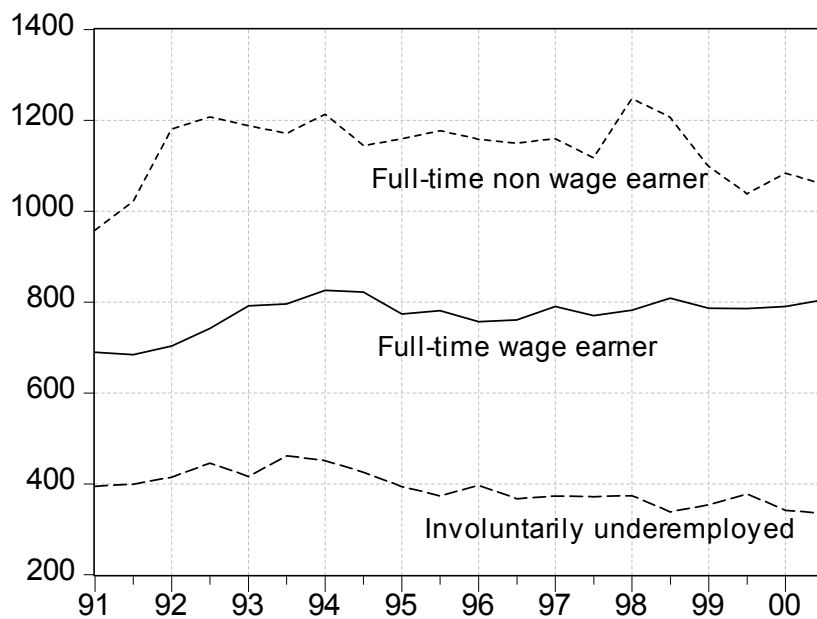
Figure 33
Structure of employment by gender
(Female/Total, in %)

Figure 34
Income by gender
(In constant May 1998 pesos)

Figure 35
Structure of employment by educational level (%)
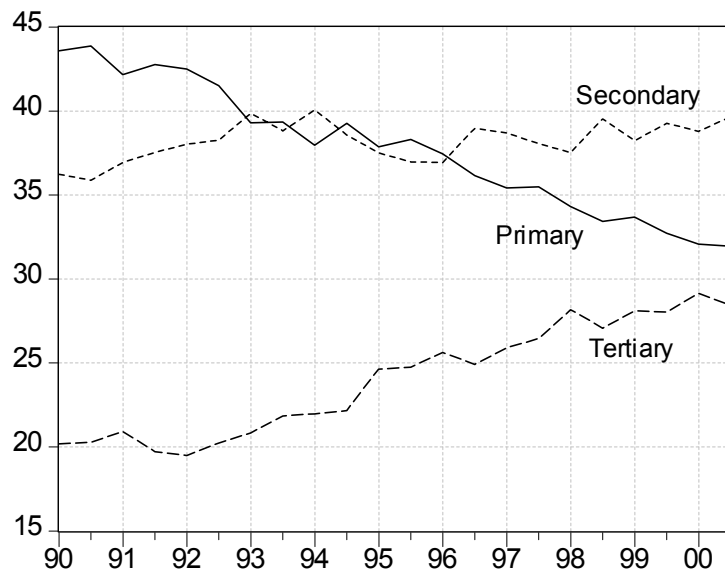
Figure 36
People with primary level education (%)
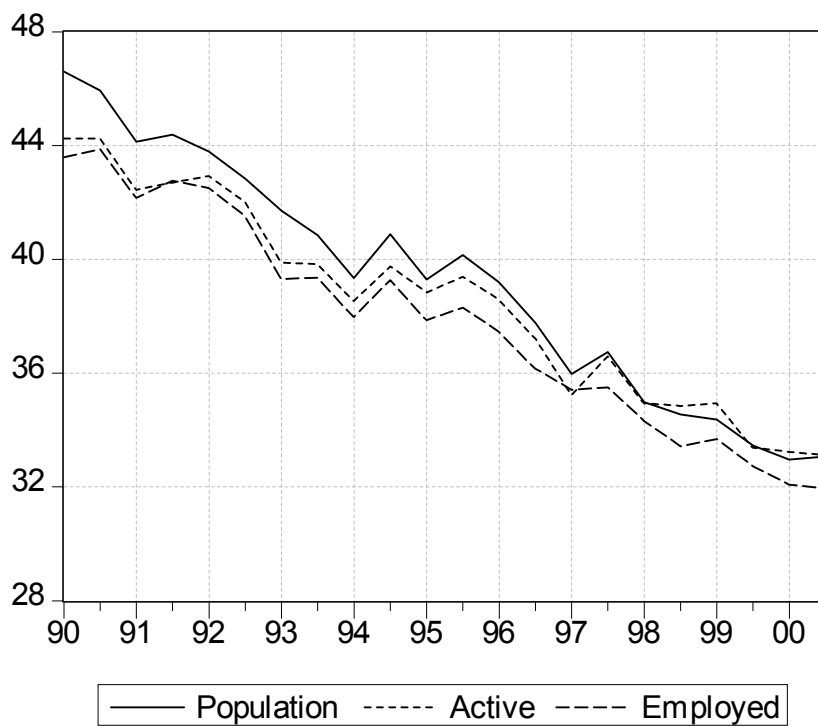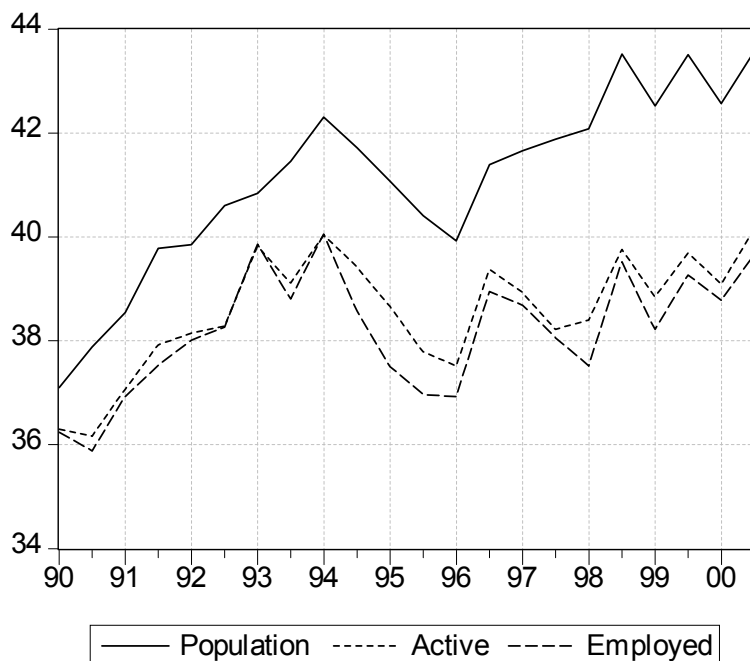

Figure 37
People with secondary level education (%)

Figure 38
People with tertiary level education (%)

Legend: —— Population ······ Active ‑‑‑‑ Employed

Figure 39
Income by educational level
(In constant May 1998 pesos)

Tertiary

Secondary

Primary

Figure 40
Employment rate by educational level
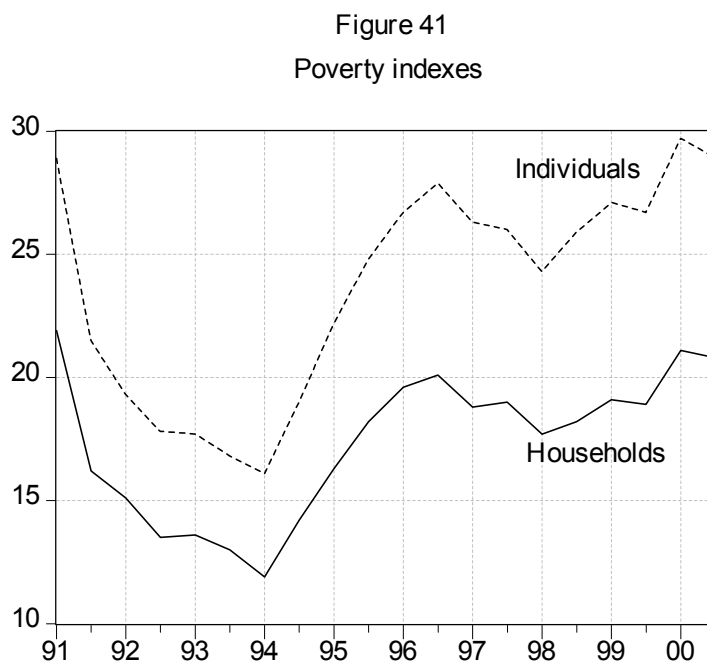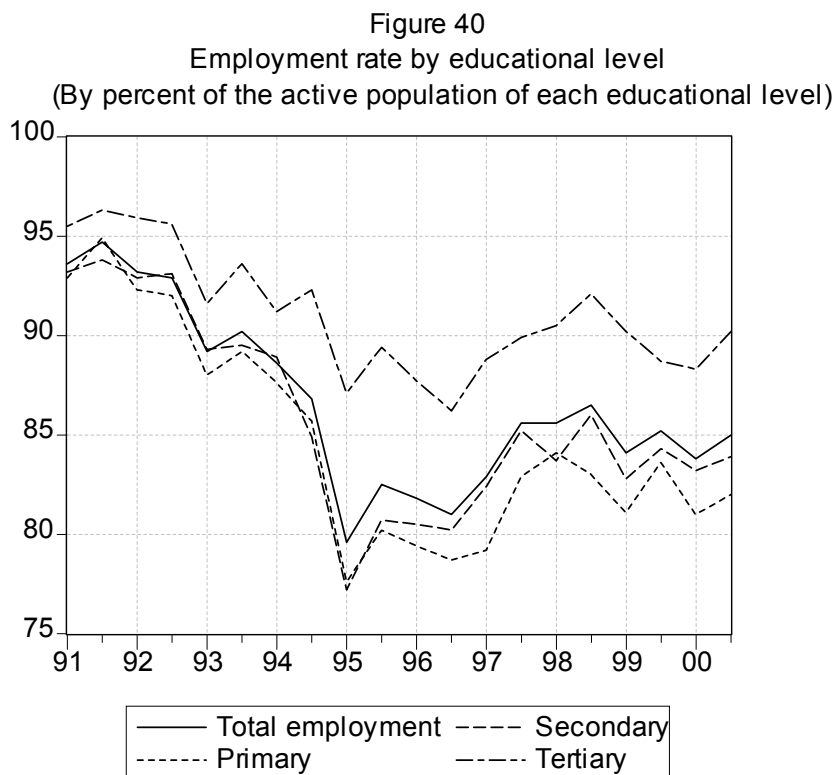(By percent of the active population of each educational level)

Figure 41
Poverty indexes
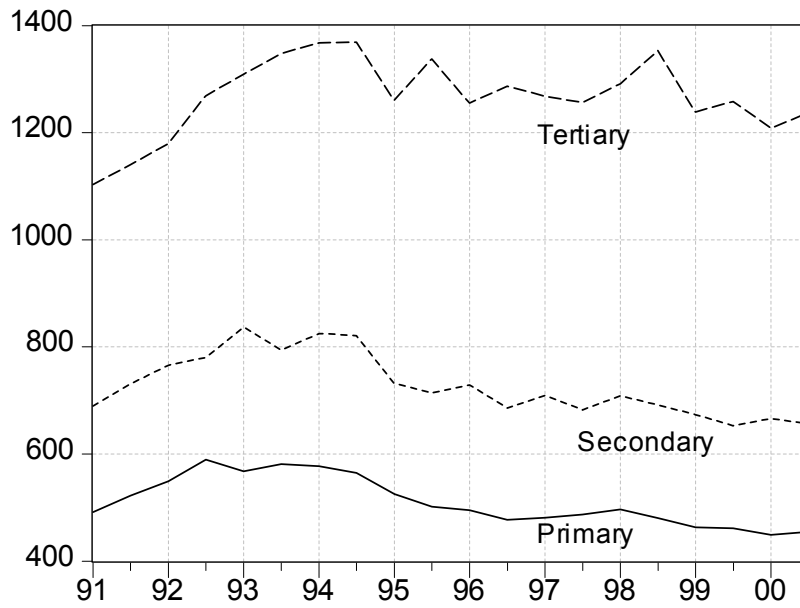
Figure 42
Indigence indexes