

ARGENTINA: SUSTAINABLE OUTPUT GROWTH AFTER THE COLLAPSE*.

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Dirección Nacional de Políticas Macroeconómicas

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1. INTRODUCTION.

This paper focuses on the rate of growth that this economy can reach within a sustainable macro framework. After the collapse of the Convertibility a reassessment of the potential possibilities of the Argentine economy is an important task that must be carried out. To embark the economy in a sustainable path requires, as point of departure, a profound assessment of the causes of the crisis and, as a result of this assessment, it's necessary to redefine the sustainability of the growth path.

Analysts agree that a single cause can hardly explain the severity of the Argentine crisis, but rather a multiplicity of reason came together to bring out the collapse. Among these multiple causes we stress the role played by external factors. More specifically, the vulnerability to extreme movement of capital flows, basically derived from the swings in the monetary policy followed by the main industrial countries. Of course that some structural domestic factors, such as the large financial currency denomination mismatch or the fragility of the fiscal position, contributed to magnify the effect of external shocks. We believe that the rigid structure of relative prices prevalent during convertibility was at the heart of the issue. This lack of flexibility made the economy considerably more vulnerable to external blows. Particularly after the Russian crisis of August 1998, Argentina plunged into a protracted recession reinforced by increasing indebtedness and real exchange rate overvaluation. Different economic authorities sought to resume growth, underestimating the increasing weight of the debt in the trap that the economy was caught. After several failed attempts to restore growth, uncertainty about the sustainability of the debt and the exchange rate grew, and a vicious circle ensued.

In order to avoid repeating the failures of the past, we need to reexamine the rate of economic growth, the evolution of debt and public finance, and the path of the relative prices that can be consistent each other in a sustainable macro framework

We compute a standard growth accounting exercise as a preliminary stage to estimate potential output. Traditionally, from the gap between actual and potential output analysts use to derive the stance of the macroeconomic policy. Sometimes output gaps are useful indicators of inflationary pressure¹. Potential output estimate are also used to cyclically adjust the fiscal balance for the

¹ However, in the present situation of Argentina the negative output gap does not necessarily imply deflation pressure.

calculation of the underlying fiscal policy position and for the assessment of the macroeconomic impact of policy initiatives.

Regrettably, we cannot place complete trust in the traditional output gap approach. First, recent traumatic events cast an eye over whether there was a once and for all reduction in the level of potential output and also a structural shift toward a slower growth path. We consider the case of some permanent effects in the level of potential output due to the breakup of financial contracts that followed the abandonment of the convertibility regime. Even more, although the formal abandonment of the convertibility regime was at the beginning of 2002 some institutional arrangements (basically monetary and exchange rate) began to be affected as from early 2001. Second, drastic changes in relative prices of goods and factor services modify the straightforward conclusions of the traditional output gap analysis. If some investment is irreversible, a new set of relative prices may constraint the production of some sectors without affecting others. These bottlenecks in the production of some sectors are not observable in the estimation of aggregate potential output. This argument affects the transition of the economy to the new “steady state” sustainable relative prices. After the collapse, “overshooting” in relative prices should favor a gradual recovery of output. This gradual recovery would allow the economy to smooth, through time, the discrepancies between aggregate output gap and bottlenecks in some sectors.

Total factor productivity (TFP) growth, though very high during the 1990's, was not sustainable. High rates of output growth cannot last if the economy increasingly hinges on uncertain and volatile international capital markets. In a context of rigid relative prices “sudden can trigger a recession and, because of real overvaluation, hide the true debt to GDP ratio. We suggest that the economy would gradually converge to a more depreciated long run real exchange rate, relative to the Convertibility.

The paper proceeds as follows. Section two presents the estimates of total factor productivity (TFP) for Argentina 1960-2000, following the growth accounting methodology. This exercise is the preliminary step for the analysis of potential output and output gap, what is done in section three. In section four, we consider permanent effects in the level of potential output (and output gap) that, with the collapse of the Convertibility plan, surged up as a consequence of the breakup of contracts and institutions. It also alerts about the effects of abrupt changes in relative prices on the possibilities of recovery in the short term. Section five briefly discusses what lies behind the evolution of TFP and the importance of considering the role of external factors in the definition of a sustainable growth path. Section six, given the recovery phase after the collapse, presents medium and long term growth prospect consistent with what we consider a sustainable macro framework. Section seven summarizes the main findings. Finally there's an appendix with an alternative approach to estimating potential output and output gap and an estimation of the index of quality of labor.

2. GROWTH ACCOUNTING: 1960-2000.

We follow the growth accounting framework as a preliminary step toward the assessment of the possibilities of the Argentinean economy of achieving long term growth. The basics of this methodology were presented in Solow (1957) and were subsequently refined by Kendrick (1961), Denison (1962) and Griliches (1969).

Growth accounting or sources of growth methodology allows us to decompose the economic growth into the contribution of basic factor inputs, such as capital and labor, and a residual. This residual, called Solow residual, is also known as total factor productivity (TFP) and reflects technological progress, among other elements.

Growth accounting does not signify a theory of economic growth. However, this exercise is viewed as a first step for the analysis of fundamental determinants of economic growth. The idea behind this decomposition is to think about separately between the determinants of input growth and TFP growth. When the presence of long recessions suggest a potential role for breaks in the deterministic trends we use dummies^{2 3}.

We start the exercise with the usual neoclassical production function, which depends on labor (L), capital (K) and TFP (A). Assuming a Cobb Douglas production function with constant returns to scale under perfectly competitive conditions we have:

Where a is the share of labor in national income. Then we can estimate the TFP as a residual:

$$\ln A = \ln Y - (1-a) \ln K - a \ln L$$
$$Y = AK^{1-a} L^a$$

For the present exercise we use the GDP series provided by *Dirección de Cuentas Nacionales*, and the capital and labor series estimated by Maia and Nicholson (2000). We also use the share of labor in the national income estimated in the national accounts at year 1993 as an estimation of a ⁴.

²Usually once you establish the breaks in the deterministic trend that captures technological or institutional changes (TFP), output should be cointegrated with the basic factors of production, capital and labor. The final step should be to relate TFP to some elements that can be considered as fundamentals.

³ The neoclassical growth model assumption of diminishing returns in physical capital implies that capital accumulation cannot sustain long-term growth, only TFP can. The source of growth is crucial for the long-term perspective. The fundamentals of the TFP are based on the endogenous growth theory.

⁴ An alternative method of estimating factor shares, following Sarel (1997), computes for each year the weighted average of the factor shares in each major economic activity in the national accounts, using as weights the relative intensities of these activities. Although this methodology permits that different activities may use different technologies of production, it has no relevant implications in the estimate of the TFP because in Argentina labor and capital shares are similar.

Noteworthy, our estimation of the production function (Solow residual) is in levels. For practical purposes our estimation in levels allows to compute potential output in levels and, therefore, we don't need to choose a year when output gap was null⁵.

As for this exercise input factors were not adjusted by quality changes (such as the level of education for labor, or residential and no residential of capital stock and capacity utilization for the capital stock) the series of TFP captures these effects⁶. There are several variables that might affects the evolution of the TFP, not present in this first exercise. The effects of human capital, institutions, and investment in imported capital goods will be considered ahead.

Chart I presents the estimation of the TFP for Argentina from 1960 to 2000. We differentiate three periods according to the evolution of total factor productivity. Of course these periods correspond to different macroeconomic policies and different international contexts.

⁵ From a theoretical point of view, cointegration literature demonstrated the superiority of level econometric estimation versus first-difference estimation when series are nonstationary.

⁶ An estimation of the Index of Quality Labor is presented in the Appendix.

CHART 1. ARGENTINA: Total Factor Productivity
Index 1960=100

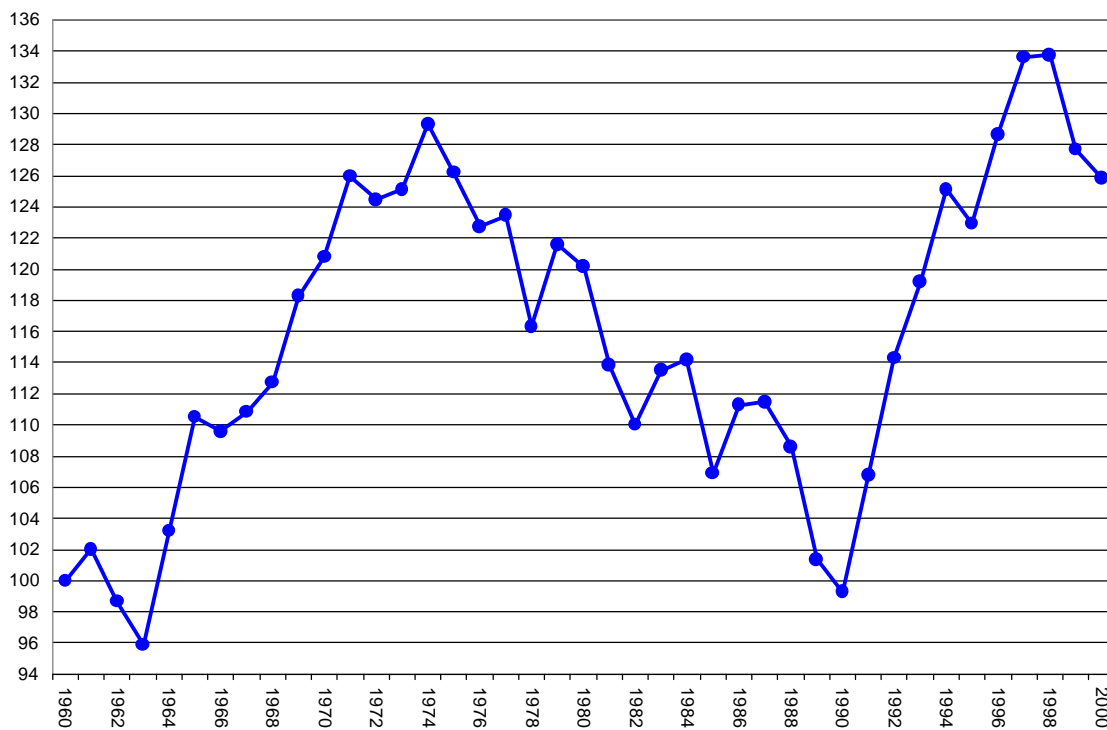


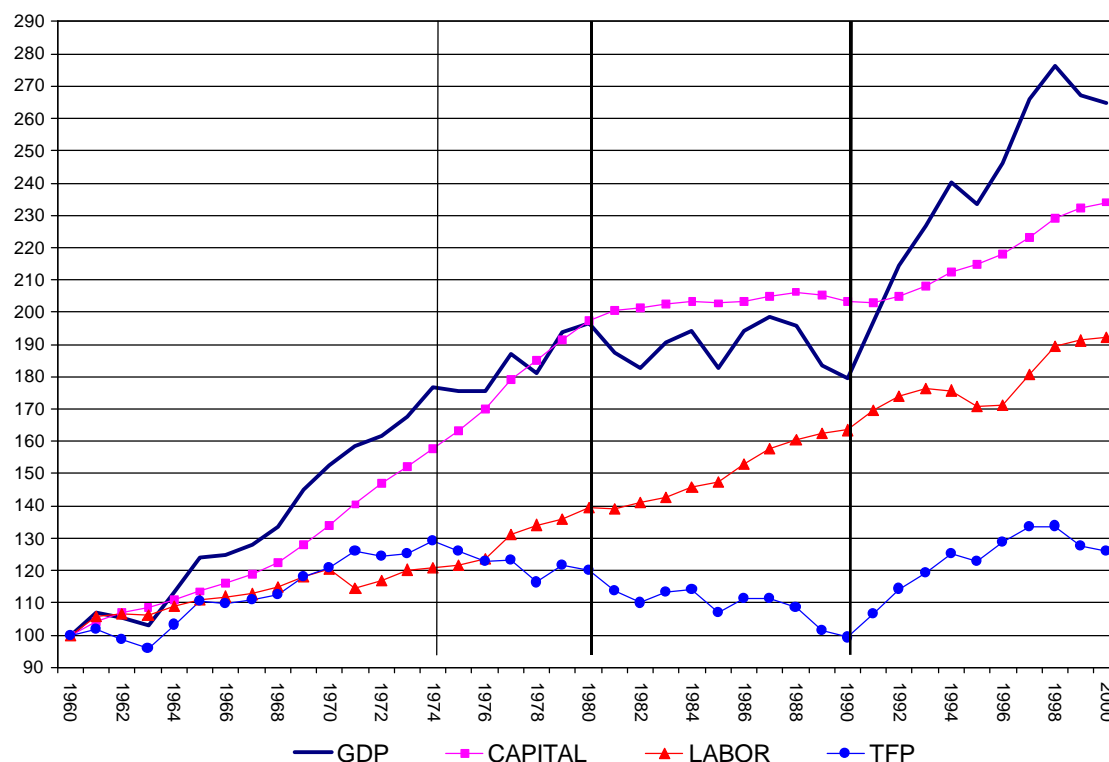
Table 1 and chart 2 present the growth accounting setting applied to Argentine economy where GDP variations are the results of variations in the basic factor inputs (labor and capital) and in the total factor productivity.

TABLE 1. ARGENTINA: GROWTH ACCOUNTING

YEAR	GDP	Capital	Labor	TFP	GDP	Capital	Labor	TFP
	millions 1993 pesos	millions 1993 pesos	thousand occupied		variation	variation	variation	variation
	actual	actual	actual	actual	actual	actual	actual	actual
1960	104,222	370,730	6,040	2.58				
1961	111,624	386,478	6,381	2.63	7.1%	4.2%	5.6%	2.0%
1962	109,853	396,811	6,440	2.54	-1.6%	2.7%	0.9%	-3.3%
1963	107,249	402,791	6,414	2.47	-2.4%	1.5%	-0.4%	-2.8%
1964	118,295	411,575	6,591	2.66	10.3%	2.2%	2.7%	7.6%
1965	129,135	421,002	6,698	2.85	9.2%	2.3%	1.6%	7.1%
1966	129,969	430,022	6,762	2.82	0.6%	2.1%	1.0%	-0.8%
1967	133,407	440,243	6,812	2.85	2.6%	2.4%	0.7%	1.1%
1968	139,141	454,487	6,944	2.90	4.3%	3.2%	1.9%	1.7%
1969	151,021	474,952	7,123	3.05	8.5%	4.5%	2.6%	4.9%
1970	159,144	496,661	7,266	3.11	5.4%	4.6%	2.0%	2.1%
1971	165,129	520,989	6,907	3.24	3.8%	4.9%	-4.9%	4.3%
1972	168,560	544,683	7,064	3.21	2.1%	4.5%	2.3%	-1.2%
1973	174,872	564,440	7,263	3.22	3.7%	3.6%	2.8%	0.5%
1974	184,325	585,490	7,301	3.33	5.4%	3.7%	0.5%	3.3%
1975	183,233	604,875	7,348	3.25	-0.6%	3.3%	0.6%	-2.4%
1976	183,209	630,095	7,469	3.16	0.0%	4.2%	1.7%	-2.7%
1977	194,908	663,687	7,930	3.18	6.4%	5.3%	6.2%	0.6%
1978	188,629	685,728	8,102	3.00	-3.2%	3.3%	2.2%	-5.8%
1979	201,865	709,734	8,220	3.13	7.0%	3.5%	1.5%	4.5%
1980	204,952	731,617	8,419	3.09	1.5%	3.1%	2.4%	-1.2%
1981	195,487	743,446	8,410	2.93	-4.6%	1.6%	-0.1%	-5.3%
1982	190,631	746,864	8,515	2.83	-2.5%	0.5%	1.3%	-3.3%
1983	198,644	751,477	8,629	2.92	4.2%	0.6%	1.3%	3.2%
1984	202,348	754,282	8,803	2.94	1.9%	0.4%	2.0%	0.6%
1985	190,414	751,822	8,912	2.75	-5.9%	-0.3%	1.2%	-6.4%
1986	202,331	753,580	9,244	2.87	6.3%	0.2%	3.7%	4.1%
1987	206,932	759,741	9,538	2.87	2.3%	0.8%	3.2%	0.2%
1988	203,954	764,877	9,693	2.80	-1.4%	0.7%	1.6%	-2.6%
1989	191,167	761,522	9,807	2.61	-6.3%	-0.4%	1.2%	-6.7%
1990	187,064	753,638	9,876	2.56	-2.1%	-1.0%	0.7%	-2.0%
1991	205,126	752,932	10,251	2.75	9.7%	-0.1%	3.8%	7.5%
1992	223,743	760,331	10,520	2.94	9.1%	1.0%	2.6%	7.1%
1993	236,505	771,708	10,652	3.07	5.7%	1.5%	1.3%	4.3%
1994	250,308	788,205	10,618	3.22	5.8%	2.1%	-0.3%	5.0%
1995	243,186	796,299	10,311	3.17	-2.8%	1.0%	-2.9%	-1.8%
1996	256,626	808,038	10,344	3.31	5.5%	1.5%	0.3%	4.6%
1997	277,441	827,530	10,918	3.44	8.1%	2.4%	5.6%	3.9%
1998	288,123	848,892	11,435	3.44	3.9%	2.6%	4.7%	0.1%
1999	278,369	860,608	11,553	3.29	-3.4%	1.4%	1.0%	-4.5%
2000	276,173	867,928	11,609	3.24	-0.8%	0.9%	0.5%	-1.4%

Source: Dirección Nacional de Políticas Macroeconómicas

CHART 2. ARGENTINA: GROWTH ACCOUNTING
Index 1960=100



In the first period of analysis, 1960-1974, TFP augmented 29%, at an annual average rate of 2%. During these years Argentina was on what, we could relatively consider a balanced growth path. Output was increasing in per capita terms at considerable rates, this growth was capital deepening (capital rates of growth were higher than labor ones), and TFP explained about 40% of GDP growth. Relative prices of goods and factor services were considered close to “e

In the following period the Argentine economy suffered one of the great depressions of the twentieth century. The sources of growth exercise shows that TFP reduction of 23% drove the growth implosion in the sixteen years between 1975 and 1990. A combination of unsound macroeconomic policies and unfavorable international events contributed to explain the Solow residual fall of 1.4% per year on average. Lax fiscal policy and accommodative monetary policy, unstable trade policy, and high international interest rates that provoked defaults of several countries, were all factors that determined highly depreciated real exchange rates and excessive capital costs.

The last period of analysis covers the Convertibility. We consider 2000 as the last year of this period because, although the formal abandonment of the convertibility regime was at the beginning of

2002, some institutional arrangements (basically monetary and exchange rate) began to be affected as from early 2001. In the 1990's economic growth was resumed and TFP growth averaged 2.4% per year, accounting more than 60% of GDP growth. This sort of growth, based on the TFP, is called intensive growth, against extensive growth, which is mainly the result of factor accumulation. Growth decomposition leads to an interpretation that plays a fundamental role in understanding long term economic growth. In this interpretation, sustained rate of technological growth is the only way, in the long run, for an economy to achieve a sustained rate of growth of output. The intuition has to do with the limits of growth for labor participation, and that higher increase in capital per worker lead to diminishing returns to this factor.

From the early 1990's several analysts attributed the transitory successful story to domestic structural reforms. The most striking issue of our growth accounting exercise is the puzzling behavior of TFP, given the final collapse of the Convertibility. To explain this apparent contradiction with the impressive recovery of TFP in the 1990's, we will consider the evolution of some fundamentals that determine TFP rate of change. In addition to structural reforms, radical changes in the international landscape helped to explain the behavior of productivity. From the beginning of the decade, expansive monetary policy in USA determined low international interest rates that, in the context of financial globalization, stimulated huge capital inflows in emerging markets, and over expanded consumption and output. As a consequence of these events real exchange rate appreciated (relative prices of non-tradable over reacted) and relative cost of capital services was considerably reduced. In spite of the initial strong recovery of output (1991-1997), accompanied by increasing capital inflows, markets began to cast doubts on the sustainability of the process, particularly after the sudden stop of capital inflows to emerging markets. Increasing indebtedness, current account deficits and financing requirements, unemployment and deterioration of social indicators, all were factors that reflected the unsustainable structure of relative prices.

Summing up, output growth during the first years of the 1990's was in principle based on TFP. This intensive growth should be heeded as sustainable. However, after the sudden stop TFP growth halted. We need to search why this happened and what's behind the TFP. In next sections we suggest that there was an over expansion of consumption and output basically driven by international abundance of capital flows to emerging markets. Preceding this analysis we perform some conventional potential output and output gap exercises.

3. POTENTIAL OUTPUT AND OUTPUT GAP: 1960-2000.

Traditionally, potential output is related to business cycle that results from changes in the aggregate demand compared with slower movements in the level of aggregate supply. In this Keynesian tradition, during recessions there are factors of production that are not fully employed, and consequently there are not inflation or wages pressures. Always in this tradition, gap between

actual and potential output allows an assessment of the stance of the macroeconomic policy. Potential output estimate are also used to cyclically adjust the fiscal balance for the calculation of the underlying fiscal policy position and for the assessment of the macroeconomic impact of policy initiatives.

In order to estimate the potential GDP our point of departure are the results of the sources of growth methodology. We assumed full employment of factors and we smooth the TFP series by removing its cyclical component. In the case of capital, assuming full utilization means potential capital equals the actual capital. For potential labor we considered the labor force (Población Económicamente Activa) less a natural rate of unemployment. This rate is assumed to be 5% until 1992 and then augmented to achieve 7% in 1999⁷. To estimate potential TFP the cyclical component is removed assuming a linear trend over three different periods, 1960-1974, 1975-1990 and 1991-2000.

Under this assumptions Table 2 presents the growth accounting estimation of the potential GDP.

⁷ New technologies for labor searches (such us Internet) justify a raise in the frictional unemployment rate.

TABLE 2. ARGENTINA: POTENTIAL OUTPUT

YEAR	GDP	Capital	Labor	TFP	GDP	Capital	Labor	TFP
	millions 1993 pesos	millions 1993 pesos	thousand occupied		variation	variation	variation	variation
	potential	potential	potential	potential	potential	potential	potential	potential
1960	100,548	370,730	6,026	2.49				
1961	107,831	386,478	6,367	2.54	7.2%	4.2%	5.7%	2.1%
1962	112,114	396,811	6,434	2.60	4.0%	2.7%	1.1%	2.1%
1963	115,149	402,791	6,418	2.65	2.7%	1.5%	-0.2%	2.1%
1964	120,585	411,575	6,600	2.71	4.7%	2.2%	2.8%	2.1%
1965	125,617	421,002	6,715	2.77	4.2%	2.3%	1.7%	2.1%
1966	130,328	430,022	6,790	2.82	3.8%	2.1%	1.1%	2.1%
1967	135,200	440,243	6,850	2.88	3.7%	2.4%	0.9%	2.1%
1968	141,680	454,487	6,991	2.95	4.8%	3.2%	2.1%	2.1%
1969	149,796	474,952	7,178	3.01	5.7%	4.5%	2.7%	2.1%
1970	156,922	496,661	7,241	3.07	4.8%	4.6%	0.9%	2.1%
1971	163,501	520,989	7,213	3.14	4.2%	4.9%	-0.4%	2.1%
1972	171,037	544,683	7,258	3.21	4.6%	4.5%	0.6%	2.1%
1973	179,169	564,440	7,379	3.27	4.8%	3.6%	1.7%	2.1%
1974	187,047	585,490	7,448	3.34	4.4%	3.7%	0.9%	2.1%
1975	184,947	604,875	7,511	3.24	-1.1%	3.3%	0.8%	-3.0%
1976	186,418	630,095	7,549	3.20	0.8%	4.2%	0.5%	-1.4%
1977	189,367	663,687	7,624	3.16	1.6%	5.3%	1.0%	-1.4%
1978	192,902	685,728	7,869	3.11	1.9%	3.3%	3.2%	-1.4%
1979	194,666	709,734	7,970	3.07	0.9%	3.5%	1.3%	-1.4%
1980	198,093	731,617	8,226	3.03	1.8%	3.1%	3.2%	-1.4%
1981	199,031	743,446	8,396	2.99	0.5%	1.6%	2.1%	-1.4%
1982	199,468	746,864	8,612	2.95	0.2%	0.5%	2.6%	-1.4%
1983	197,657	751,477	8,639	2.91	-0.9%	0.6%	0.3%	-1.4%
1984	197,740	754,282	8,839	2.87	0.0%	0.4%	2.3%	-1.4%
1985	197,584	751,822	9,078	2.83	-0.1%	-0.3%	2.7%	-1.4%
1986	198,703	753,580	9,391	2.79	0.6%	0.2%	3.4%	-1.4%
1987	200,065	759,741	9,687	2.75	0.7%	0.8%	3.2%	-1.4%
1988	200,109	764,877	9,882	2.72	0.0%	0.7%	2.0%	-1.4%
1989	199,653	761,522	10,131	2.68	-0.2%	-0.4%	2.5%	-1.4%
1990	196,276	753,638	10,157	2.64	-1.7%	-1.0%	0.3%	-1.4%
1991	214,114	752,932	10,491	2.83	9.1%	-0.1%	3.3%	7.3%
1992	223,357	760,331	10,764	2.90	4.3%	1.0%	2.6%	2.4%
1993	234,229	771,708	11,105	2.97	4.9%	1.5%	3.2%	2.4%
1994	243,821	788,205	11,239	3.05	4.1%	2.1%	1.2%	2.4%
1995	255,522	796,299	11,626	3.12	4.8%	1.0%	3.4%	2.4%
1996	263,866	808,038	11,658	3.19	3.3%	1.5%	0.3%	2.4%
1997	278,224	827,530	12,056	3.27	5.4%	2.4%	3.4%	2.4%
1998	290,407	848,892	12,218	3.35	4.4%	2.6%	1.3%	2.4%
1999	302,687	860,608	12,474	3.43	4.2%	1.4%	2.1%	2.4%
2000	314,235	867,928	12,699	3.51	3.8%	0.9%	1.8%	2.4%

Source: Dirección Nacional de Políticas Macroeconómicas

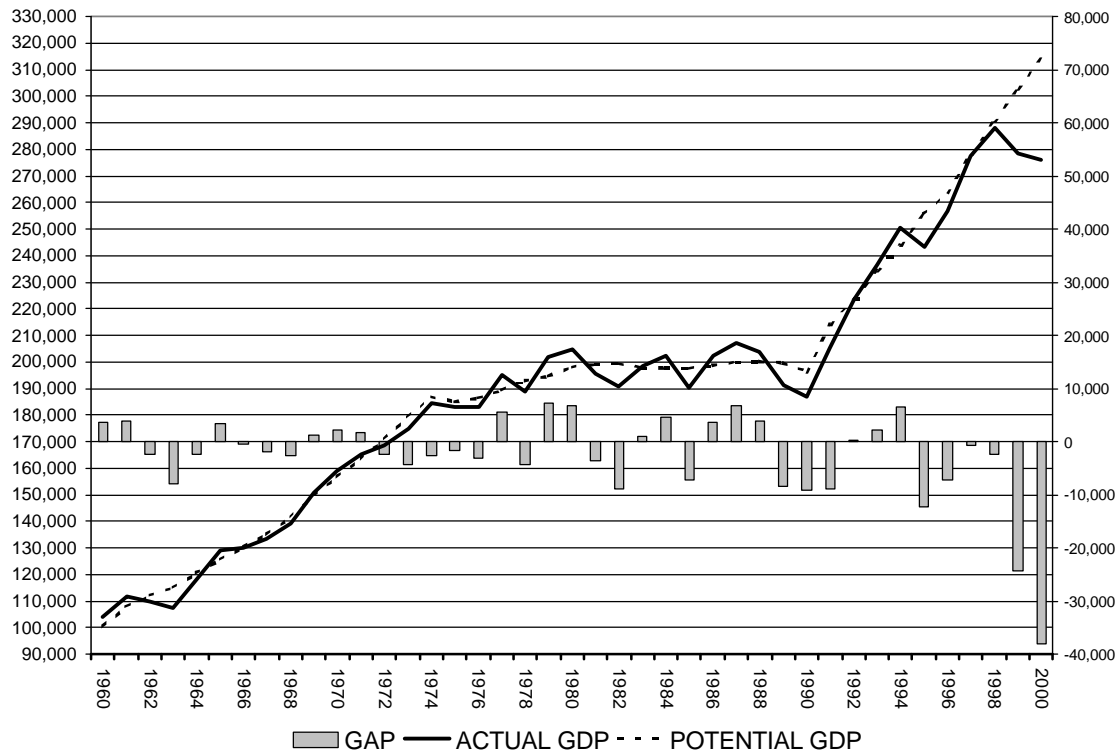
Given these estimations we calculate the gap between the actual and the potential GDP. This series are presented in Table 3 and Chart 3.

TABLE 3. ARGENTINA: OUTPUT GAP

YEAR	GDP		GDP		GAP	
	millions 1993 pesos	millions 1993 pesos	variation	variation	millions 1993 pesos	percentage of the actual GDP
	actual	potential	actual	potential		
1960	104,222	100,548			3,674	3.5%
1961	111,624	107,831	7.1%	7.2%	3,793	3.4%
1962	109,853	112,114	-1.6%	4.0%	-2,261	-2.1%
1963	107,249	115,149	-2.4%	2.7%	-7,900	-7.4%
1964	118,295	120,585	10.3%	4.7%	-2,290	-1.9%
1965	129,135	125,617	9.2%	4.2%	3,518	2.7%
1966	129,969	130,328	0.6%	3.8%	-359	-0.3%
1967	133,407	135,200	2.6%	3.7%	-1,793	-1.3%
1968	139,141	141,680	4.3%	4.8%	-2,538	-1.8%
1969	151,021	149,796	8.5%	5.7%	1,225	0.8%
1970	159,144	156,922	5.4%	4.8%	2,221	1.4%
1971	165,129	163,501	3.8%	4.2%	1,628	1.0%
1972	168,560	171,037	2.1%	4.6%	-2,477	-1.5%
1973	174,872	179,169	3.7%	4.8%	-4,298	-2.5%
1974	184,325	187,047	5.4%	4.4%	-2,722	-1.5%
1975	183,233	184,947	-0.6%	-1.1%	-1,714	-0.9%
1976	183,209	186,418	0.0%	0.8%	-3,209	-1.8%
1977	194,908	189,367	6.4%	1.6%	5,540	2.8%
1978	188,629	192,902	-3.2%	1.9%	-4,274	-2.3%
1979	201,865	194,666	7.0%	0.9%	7,199	3.6%
1980	204,952	198,093	1.5%	1.8%	6,859	3.3%
1981	195,487	199,031	-4.6%	0.5%	-3,544	-1.8%
1982	190,631	199,468	-2.5%	0.2%	-8,837	-4.6%
1983	198,644	197,657	4.2%	-0.9%	987	0.5%
1984	202,348	197,740	1.9%	0.0%	4,607	2.3%
1985	190,414	197,584	-5.9%	-0.1%	-7,170	-3.8%
1986	202,331	198,703	6.3%	0.6%	3,628	1.8%
1987	206,932	200,065	2.3%	0.7%	6,867	3.3%
1988	203,954	200,109	-1.4%	0.0%	3,845	1.9%
1989	191,167	199,653	-6.3%	-0.2%	-8,486	-4.4%
1990	187,064	196,276	-2.1%	-1.7%	-9,212	-4.9%
1991	205,126	214,114	9.7%	9.1%	-8,988	-4.4%
1992	223,743	223,357	9.1%	4.3%	386	0.2%
1993	236,505	234,229	5.7%	4.9%	2,275	1.0%
1994	250,308	243,821	5.8%	4.1%	6,487	2.6%
1995	243,186	255,522	-2.8%	4.8%	-12,336	-5.1%
1996	256,626	263,866	5.5%	3.3%	-7,240	-2.8%
1997	277,441	278,224	8.1%	5.4%	-782	-0.3%
1998	288,123	290,407	3.9%	4.4%	-2,283	-0.8%
1999	278,369	302,687	-3.4%	4.2%	-24,318	-8.7%
2000	276,173	314,235	-0.8%	3.8%	-38,062	-13.8%

Source: Dirección Nacional de Políticas Macroeconómicas

CHART 3. ARGENTINA: OUTPUT GAP
In millions of 1993 pesos



The first period of analysis was already mentioned as a relatively balanced growth period. Between 1960-74 actual GDP grew at an average annual rate of 4.2% while the potential output did it at slightly higher rate of 4.5%. Then, during the flat period, 1975-90, both series, actual and potential GDP, showed almost no tendency.

For the Convertibility period actual GDP grew at a 4% annual rate but potential output grew at a 4.8% average annual rate, a higher rate than it shows for the first analyzed period.

Our potential output results indicate that output gap was close to zero twice during the 1990s, in 1992 and in 1997. According with this traditional approach only in 1994 the Argentine economy would have showed some sings of “overheating”. Maybe more striking is the significant negative output gap of the end of the period. This result is derived from the implicit assumption that considers output fall, that began in the second quarter of 1998, stems from business cycle factors rather than a slowing of potential output growth.

4. GROWTH ACCOUNTING AND OUTPUT GAP: THE COLLAPSE 2001-2002.

Regrettably, we cannot place complete trust in the traditional output gap approach followed in the previous sections.

Recent traumatic events cast an eye over whether there was a once and for all reduction in the level of potential output and also a structural shift toward a slower growth path. In this section we consider the case of some permanent effects in the level of potential output due to the breakup of financial contracts that followed the abandonment of the convertibility regime. Even more, although the formal abandonment of the convertibility regime was at the beginning of 2002 some institutional arrangements (basically monetary and exchange rate) began to be affected as from early 2001.

In recent years there has been a resurgence of interest in the relationship between growth and institutions⁸. This renewed attention has received some empirical support. There is substantial evidence suggesting that growth-enhancing policies, basically human capital accumulation, are likely to arise or be effective where institutions are strong. However, all this evidence is based on the facts that institutions tend to develop slowly, against policies that often display significant variability through time. The recent unprecedented collapse represents an institutional backward step, which consequences will only be able to precise in the future. We assume that the effects on institutions affected TFP in some permanent way. Anyhow, our destruction assumption of TFP can be deemed as strong given the recent evolution of the economy.

Table 4 presents the growth accounting figures since 1990 until 2002. Reduction in actual GDP by

TABLE 4. ARGENTINA: GROWTH ACCOUNTING

YEAR	GDP	Capital	Labor	TFP	GDP	Capital	Labor	TFP
	millions 1993 pesos	millions 1993 pesos	thousand occupied		variation	variation	variation	variation
	actual	actual	actual	actual	actual	actual	actual	actual
1990	187,064	753,638	9,876	2.56				
1991	205,126	752,932	10,251	2.75	9.7%	-0.1%	3.8%	7.5%
1992	223,743	760,331	10,520	2.94	9.1%	1.0%	2.6%	7.1%
1993	236,505	771,708	10,652	3.07	5.7%	1.5%	1.3%	4.3%
1994	250,308	788,205	10,618	3.22	5.8%	2.1%	-0.3%	5.0%
1995	243,186	796,299	10,311	3.17	-2.8%	1.0%	-2.9%	-1.8%
1996	256,626	808,038	10,344	3.31	5.5%	1.5%	0.3%	4.6%
1997	277,441	827,530	10,918	3.44	8.1%	2.4%	5.6%	3.9%
1998	288,123	848,892	11,435	3.44	3.9%	2.6%	4.7%	0.1%
1999	278,369	860,608	11,553	3.29	-3.4%	1.4%	1.0%	-4.5%
2000	276,173	867,928	11,609	3.24	-0.8%	0.9%	0.5%	-1.4%
2001	263,997	867,411	11,589	3.10	-4.4%	-0.1%	-0.2%	-4.3%
2002	234,676	852,833	11,352	2.81	-11.1%	-1.7%	-2.1%	-9.4%

Source: Dirección Nacional de Políticas Macroeconómicas

⁸ IMF World Economic Outlook (2003) summarizes the theoretical and empirical findings since the pioneering paper of Hall and Jones (1999).

15% between 2000 and 2002 is mostly explained by the 13% reduction in the TFP.

What happened then with the potential GDP in the period 2001-2002? As we mentioned in this exercise we assume the reduction in the observed TFP is a permanent one. Chart 4 presents actual and potential TFP from 1960 until 2002.⁹

CHART 4. ARGENTINA: Total Factor Productivity
Index actual TFP 1960=100

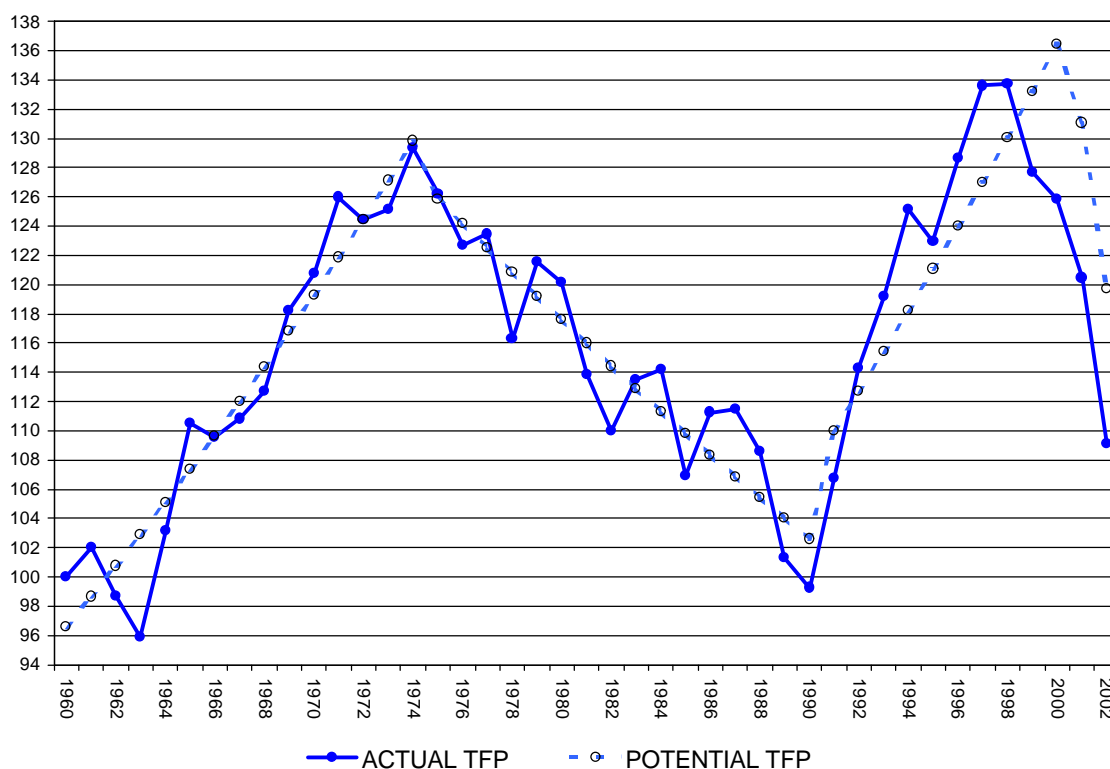


Table 5 presents the estimate of potential GDP since 1990 until 2002. The reduction in the level of the potential TFP in 2001 and 2002 equal the level reductions in the observed TFP.

⁹ Another possibility to estimate the potential TFP is to apply the Hodrick-Prescott filter. This alternative is presented in the Appendix.

TABLE 5. ARGENTINA: POTENTIAL OUTPUT

YEAR	GDP	Capital	Labor	TFP	GDP	Capital	Labor	TFP
	millions 1993 pesos	millions 1993 pesos	thousand occupied		variation	variation	variation	variation
	potential	potential	potential	potential	potential	potential	potential	potential
1990	196,276	753,638	10,157	2.64				
1991	214,114	752,932	10,491	2.83	9.1%	-0.1%	3.3%	7.3%
1992	223,357	760,331	10,764	2.90	4.3%	1.0%	2.6%	2.4%
1993	234,229	771,708	11,105	2.97	4.9%	1.5%	3.2%	2.4%
1994	243,821	788,205	11,239	3.05	4.1%	2.1%	1.2%	2.4%
1995	255,522	796,299	11,626	3.12	4.8%	1.0%	3.4%	2.4%
1996	263,866	808,038	11,658	3.19	3.3%	1.5%	0.3%	2.4%
1997	278,224	827,530	12,056	3.27	5.4%	2.4%	3.4%	2.4%
1998	290,407	848,892	12,218	3.35	4.4%	2.6%	1.3%	2.4%
1999	302,687	860,608	12,474	3.43	4.2%	1.4%	2.1%	2.4%
2000	314,235	867,928	12,699	3.51	3.8%	0.9%	1.8%	2.4%
2001	304,838	867,411	12,946	3.38	-3.0%	-0.1%	1.9%	-4.0%
2002	278,673	852,833	13,152	3.08	-8.6%	-1.7%	1.6%	-8.6%

Source: Dirección Nacional de Políticas Macroeconómicas

One difference in the figures of actual and potential growth during the crisis is the evolution of labor series. While potential labor rises 4% actual labor reduces 2%. This is consistent with the rise in the unemployment rate, which attained 21.5% in 2002. This fact explains why potential output growth exceeded actual output growth during the 1990's.

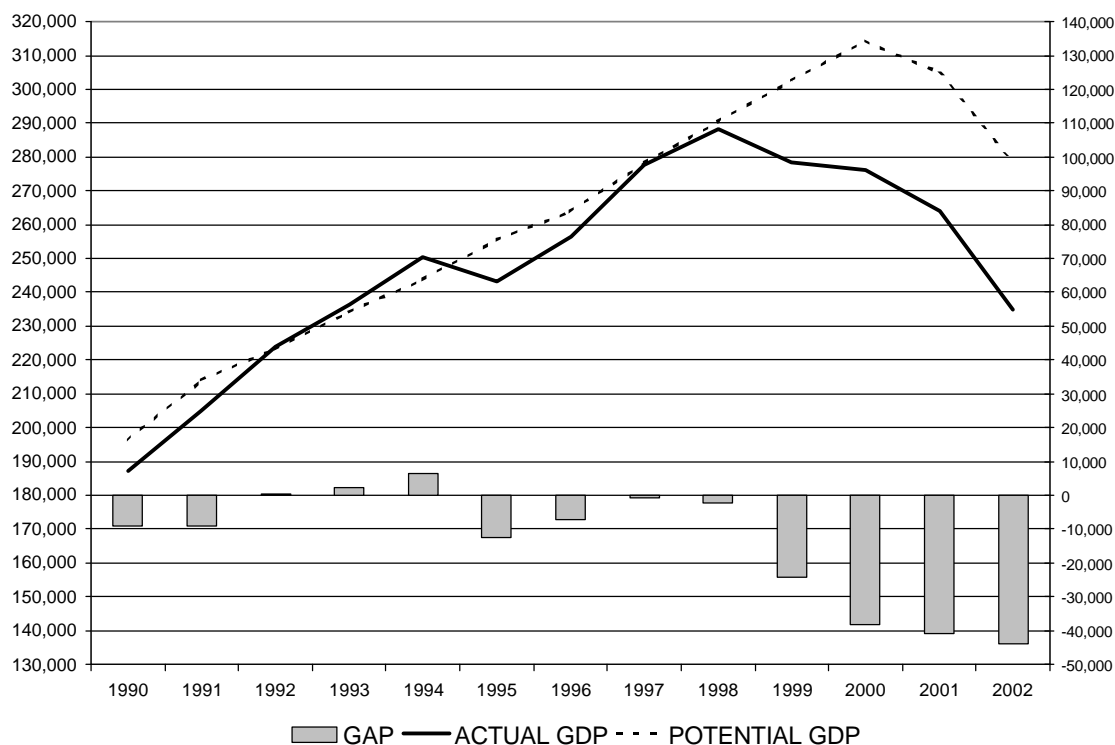
Now we can also calculate the output gap during the crisis. Table 6 and Chart 5 presents observed and potential GDP and the output gap since 1990 until 2002. Clearly year 2002 with 19% of negative gap is the minimum of this series (even since 1960).

TABLE 6. ARGENTINA: OUTPUT GAP

YEAR	GDP	GDP	GDP	GDP	GAP	GAP
	millions 1993 pesos	millions 1993 pesos	variation	variation	millions 1993 pesos	percentage of the actual GDP
	actual	potential	actual	potential		
1990	187,064	196,276			-9,212	-4.9%
1991	205,126	214,114	9.7%	9.1%	-8,988	-4.4%
1992	223,743	223,357	9.1%	4.3%	386	0.2%
1993	236,505	234,229	5.7%	4.9%	2,275	1.0%
1994	250,308	243,821	5.8%	4.1%	6,487	2.6%
1995	243,186	255,522	-2.8%	4.8%	-12,336	-5.1%
1996	256,626	263,866	5.5%	3.3%	-7,240	-2.8%
1997	277,441	278,224	8.1%	5.4%	-782	-0.3%
1998	288,123	290,407	3.9%	4.4%	-2,283	-0.8%
1999	278,369	302,687	-3.4%	4.2%	-24,318	-8.7%
2000	276,173	314,235	-0.8%	3.8%	-38,062	-13.8%
2001	263,997	304,838	-4.4%	-3.0%	-40,841	-15.5%
2002	234,676	278,673	-11.1%	-8.6%	-43,997	-18.7%

Source: Dirección Nacional de Políticas Macroeconómicas

CHART 5. ARGENTINA: OUTPUT GAP
In millions of 1993 pesos



In spite of considering the destruction of TFP in 2001-2002 as permanent effects, the overall evidence of the traditional approach suggests that there was an important output gap in 2002. What does it mean? This conclusion does not necessarily be deemed as evidence that the economic policy should be directed toward raising aggregate demand as fast as possible. As will show in next sections, drastic changes in relative prices of goods and factor services modify the straightforward conclusions of the traditional output gap analysis. If some investment is irreversible, a new set of relative prices may constraint the production of some sectors working at full capacity without affecting others with excess capacity. These bottlenecks in the production of some sectors are not observable in the estimation of aggregate potential output. This argument affects the transition of the economy to the new “steady state” sustainable relative prices, particularly the equilibrium real exchange rate (ERER) that we suggest will be relatively more depreciated than in the 1990’s. Therefore post-collapse “overshooting” in relative prices should favor the adoption of gradual aggregate demand policies. This gradual recovery would allow the economy to smooth through time the discrepancies between aggregate output gap and bottlenecks in some sectors. This “transition” arguments require an extremely careful “fine tuning” in the macroeconomic policy management.

Nevertheless there is one important caveat against the irreversibility argument we don't want to miss. Relative to previous periods, in the 1990's investment in capital goods that depreciate rapidly prevailed against long live capital goods and structures, which are the most susceptible to the irreversibility constraint. This situation may shorten the transition period.

Summing up. There is no doubt the break up of institutions affected the level of TFP and potential output in some way in the long run. Nevertheless there is other "transitory" considerations why the straightforward traditional approach of output gap do not apply. We need to be very careful in the adoption of expansive aggregate demand policies. Bottlenecks in some productive sectors prevent the temptation of closing the gap in the very short run.

5. AFTER THE COLLAPSE OF CONVERTIBILITY, WHAT IS SUSTAINABLE?

To embark the economy in a sustainable path requires, as point of departure, a profound assessment of the causes of the crisis and, given this assessment, it's necessary to redefine the sustainability of the growth path.

5.1. *The origins of the crisis: the role of equilibrium real exchange rate.*

The Convertibility was the response to a "lost decade" (the 1980's) characterized by lax fiscal policy and accommodative monetary policy that finished with hyperinflations. It was an integral plan that included privatizations, social security reform, deregulation of financial markets (mainly), debt restructuring under the Brady Plan, tax reform based on VAT and a currency board arrangement. From an economic point of view, it was a quasi-currency board. The system implemented was not just a special type of pegged exchange rate arrangement. It represented a special type of monetary policy rule that ensured that money supply and demand were always balanced. However, it was even more than that, the Convertibility in general and the currency board in particular became an institutional arrangement, part of a new social contract.

Analysts agree that a single cause can hardly explain the severity of the Argentine crisis, but rather a multiplicity of reason came together to bring out the collapse of the Convertibility¹⁰. Among these multiple causes we stress the role played by external factors¹¹. More specifically, the vulnerability to extreme movements of capital flows, basically derived from the monetary policy followed by the main industrial countries. Of course that domestic factors, such as the large financial currency denomination mismatch or the fragility of the fiscal position, contributed to magnify the effect of

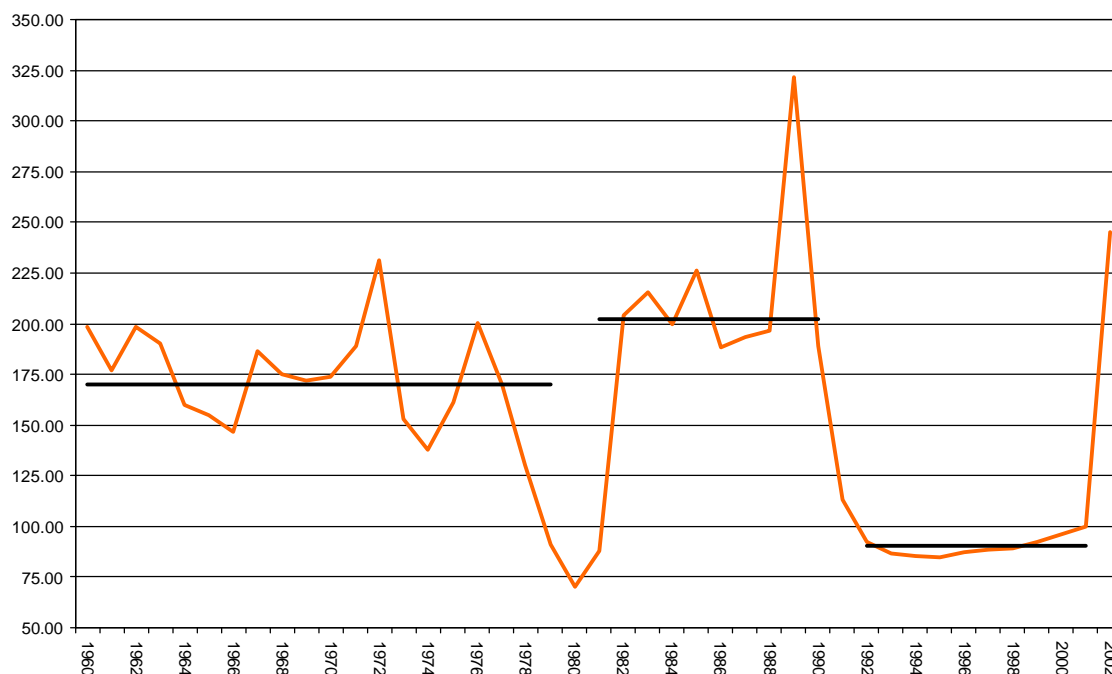
¹⁰ For example, Perry and Servén (2002).

¹¹ Following the argument of Calvo, Leiderman and Reinhart (1993).

external shocks. We believe that the rigid structure of relative prices prevalent during convertibility was at the heart of the issue¹². This lack of flexibility made the economy considerably more vulnerable to external blows¹³.

Chart 6 presents the evolution of the RER, AR\$/US\$ based on CPI's of both countries, during the past four decades. During the 1990's the average RER was about 55% more appreciated than the average of the 1980's. Even more, the average RER of the 1990's was also 48% more appreciated than the average of the period 1960-1974, previously considered a period when relative prices were closer to "equilibrium".

CHART 6. ARGENTINA: REAL EXCHANGE RATE AR\$ / US\$
Index 2001=100



¹² However, we believe relative price rigidity can be explained by reasons other than those that are generally mentioned: fixed nominal exchange rates and inflexibility of wages. A frequently forgotten factor is the fact that the rates of the privatized service utilities were adjusted for US inflation. This defect of the privatization process in Argentina was even more evident when Argentina entered a long recession, which began with the Russian crisis of August 1998, while the American economy experienced a growth "boom". Thus utility rates have a direct impact of 15% in the CPI, and grew almost 10% during recession, while wages in the informal sector fell almost 30% in the same period.

¹³ Rigid relative prices are part of the inflexibility of contracts in an institutional framework. See Galiani S., Daniel Heymann and M. Tommasi (2003). Thus, the particular configuration and currency denomination of contracts, that delayed the required change in relative prices, increased the vulnerability to domestic and external shocks.

Effectively, the real exchange rate of the 1990's couldn't be sustained. However, different reasons were offered to explain the persistent real appreciation of the domestic currency as an equilibrium phenomenon.

In theory, EREER results from the simultaneous attainment of both domestic and external balance. Domestic balance holds when the market for non-tradable goods clears, while external equilibrium claims that present and future current account balances are compatible with "sustainable" capital flows. Therefore, we can decompose the aggregate EREER into two relative prices: internal EREER and external EREER.

Domestic balance is related to the concept of internal EREER which emphasizes differences in productivity growth between countries and tradable and non-tradable sectors as the main long run determinants of EREER. Many authors consider the effect of productivity differentials or Balassa-Samuelson effect as the first determinant of RER beyond the purchasing power parity (that implies a constant EREER). The effect works as follows, a rise in the relative productivity of the tradable sector leads to an increase in the labor demand and wages. Since the non-tradable market clears domestically and nominal wages equalize across sectors, prices of non-tradable must increase relative to those of tradable to avoid a production shrink and, therefore, an excess demand for non-tradables.

Nonetheless the Balassa-Samuelson effect rests on two important assumptions. First, that productivity growth in tradable sectors drives aggregate productivity growth. Second, the law of one price applies to tradable sector or in other words home and foreign produced tradables are perfect substitutes. Recent empirical evidence cast a shadow over this last presumption, it found a large and persistent deviation from the law of one price in prices of tradable goods between countries¹⁴.

External balance focus on the underlying net foreign asset position (stocks) and the adequacy of capital flows to sustain the current account balance (flows) as determinants of long run EREER. The external balance clears the tradable goods market. The evolution of the current account results, that leads to changes in the net foreign asset position, depends on competitiveness reflected by external RER (relative price of domestic and foreign tradables).

During several years of the past decade high rates of growth, as we showed mainly based on TFP, appreciated the internal EREER. However, as long as rising debt deteriorated the net foreign asset

¹⁴ This finding could explain why despite productivity growth sometimes we can observe RER depreciation. See for example Lee and Tang (2003).

position, the external ERER depreciated. A well argued speech says that there is no problem up to this debt is private. Anyway, Argentina augmented its external debt, both private and public.

Perry and Serven (2002) estimated both, internal and external ERER, concluding that the aggregate RER was not overvalued in Argentina in the period 1990-1996, moreover they found a slight undervaluation of the RER. They argue that the initial appreciation of the ERER, attributed to productivity differential (efficiency gains derived from the end of hyperinflation and structural reforms) between Argentina and her trading partners, explained the absence of overvaluation in that period. Real appreciation would have been an equilibrium phenomenon. In the next subsection we suggest that productivity (TFP) growth in that period was not sustainable, because it was the result of the temporary international abundance of capital that over-expanded aggregate demand and output.

5.2. Productivity growth sustainability: the role of capital flows volatility.

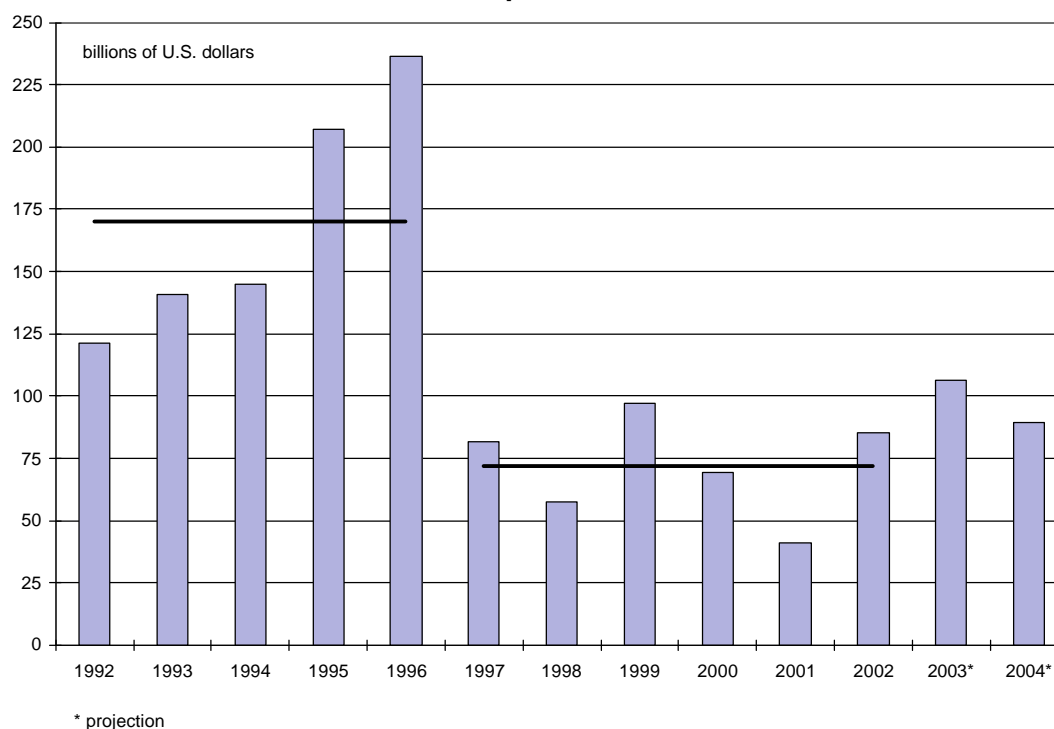
Analytical purposes recommend decomposing economic growth in the 1990's between endogenous factors (structural reforms) and exogenous factors (huge abundance or lack of capital flows). In fact, global liberalization of capital accounts cum abundance of capital in international markets (mainly due to expansive monetary policy in USA), increased net inflows toward the totality of emerging markets. Annual net private capital flow averaged 170 billion dollars between 1992-1996 of which Argentina captured an important share. Abundant and reduced cost of foreign capital over expanded aggregate demand and GDP growth. This over expansion transitory increased TFP¹⁵. During the 1990's this TFP growth was linked to increasing imports of capital goods and foreign direct investment (FDI), temporarily fueled by abundant and reduced cost of capital.

Nevertheless growth cannot last if the economy increasingly hinges on uncertain and volatile international capital markets. After the "sudden stop" in 1997, capital flows toward the totality of emerging markets reduced to an average of 70 billion in the following five years. Of course that this exogenous shock was amplified by other domestic failures, such as the large financial dollarization¹⁶ and the fragility of the fiscal stance. In a context of rigid relative prices and rigid contracts the probability that "sudden stops" in capital inflows trigger a recession augments. When this happens, TFP also suddenly disappears and both internal and external ERER combines to determine an overall depreciation of ERER. Net capital inflows to the Emerging Economies are

¹⁵ Volatile international capital markets and its effects over GDP claims for the reassessment of alternative schemes for debt restructuring. Maia (2003) introduces a new proposal for debt restructuring that consists on tying the debt repayment to net capital inflows toward the totality of emerging economies as contingent clause.

presented in Chart 7. Because of inflexible relative prices, real overvaluation hides the true debt to GDP ratio.

**CHART 7. EMERGING ECONOMIES:
Net Capital Inflows**



Particularly after the Russian crisis of August 1998, Argentina plunged into a protracted recession. The sudden capital flow reversal triggered recession, reducing productivity, abruptly increasing the relative cost of capital and depreciating the ERER. Meanwhile, debt, both public and private, current account deficits, unemployment and other social indicators, kept continuously deteriorating. Different economic authorities sought to resume growth, underestimating the weight of the debt in the trap that the economy was caught. After several failed attempts to restore growth, uncertainty about the debt and the exchange rate grew, and a vicious circle ensued.

In order to avoid repeating the failures of the past, a sustainable macro framework needs that the rate of economic growth, the evolution of debt and public finance, and the path of the relative prices

¹⁶ De la Torre, Augusto, Eduardo Levy Yeyati and Sergio Schmukler (2002) emphasizes the links between money and banking and the costs of financial dollarization during the Convertibility.

of goods and factor services be consistent. The actual and potential output path would converge to levels consistent with a new set of relative prices.

In the next section, we present actual and potential output forecasts. They consider that some fundamentals of the ERER would probably differ from those that prevailed during the convertibility: productivity differentials between tradable and non-tradable sectors and capital inflows.

6. ACTUAL AND POTENTIAL OUTPUT FORECASTS.

6.1. *Recovery after the collapse*

Argentina suffered one of the most important crises of its economic history, if not the worst. GDP at constant prices dropped 10.9% in 2002 (a drop similar to the one recorded in 1914 and higher than those of 1931 and 1932), accompanied by an even higher reduction in consumption (-12.9%). Investment and imports suffered even bigger fall, -36.1 and -49.7%. Unemployment reached in May 2002 a rate of 21.5% in urban agglomerations, and the proportion of the population under the line of poverty and indigence was higher than the one during the hyperinflation, in the early nineties.

2002 was just only the last year of the recession phase that began after the Russian crisis in 1998. As from the second quarter of that year up to the first quarter of 2002, GDP seasonally adjusted accumulated a fall of over 20%. Investment went on decreasing until the third quarter of 2002, accumulating, as from its peak, also in the second quarter of 1998, a fall of 60%. In spite of this very long recession, the worst came to the worst as from mid 2001, when the markets had begun to predict the end of the Convertibility regime. In only three-quarters, between the second quarter of 2001 and the first of 2002, GDP fell by more than 15%. Even after the abandonment of the regime and the postponement of some foreign payments at the beginning of 2002, the economy plunged once more in the first quarter of that year.

In the second quarter, and against the forecaster consensus of very bleak prospects, the economy ceased falling and even began to show a slow recovery in spite of the still unstable monetary and financial variables. Contrasting the depreciation of the eighties, the low pass through of depreciation to prices made it possible that, even in the worst moments, the notion of some fundamental relative prices were maintained. The low pass through of nominal depreciation to domestic prices outlined a new structure of relative prices of goods and factor services that, with the stabilization of financial variables, started an important process of import substitutions. A cautious monetary policy and continued fiscal consolidation facilitated these positive developments. Exchange rate stabilization also stopped the deep deterioration of the social situation of an important part of the population, due to the high permeability of the indicators of indigence and poverty to changes in the value of basic baskets, food and total.

It is worth mentioning that this recovery has been positively modified throughout the quarters. Thus, as from the second quarter of last year two sub-periods can be noticed as regards the participation of each component of the aggregate demand in the GDP recovery.

- a) A first sub-period (second and third quarters of 2002) characterized by a negative participation in the domestic absorption, because both consumption (private and public) and investment negatively influenced product growth. GDP recovery was explained by a positive participation of net exports (low growth of exports and important import substitution).
- b) A second sub-period (as from the last quarter of 2002) started to evidence signs of recovery which can have lasting effects, what is deduced when it is observed that both private consumption participation and investment¹⁷ have become positive since the last quarter of the year. In the meantime, net exports started to negatively contribute to GDP recovery, as a result of the seasonally adjusted recovery of imports¹⁸. This tendency has continued through 2003.

These changes in the composition of the GDP variation contributed to modify the initial skepticism for the durability of the recovery phase. A reassessment of the potential possibilities of the Argentine economy is an important task that must be carried out. The shift of this recovery phase into a sustainable growth path depends on the solutions of some pending structural problems the economy faces and the set of macro policies underlying the growth process.

6.2. Forecasts

Based on the results of the potential output analysis and the particular characteristics of the present economic situation introduced in the previous sections, we prepared a baseline forecast for actual and potential output.

Potential output forecast is based on the following assumptions. The baseline scenario "steady state" long run GDP growth is 3%. How do we get this result? Labor long run growth rate was assumed to be almost 1.5% in line with population growth. Given the aggregate production function assumptions we have made, capital stock in the long term must grow at the same rate as labor, 1.5%. Long run TFP growth rate is also 1.5% per year. TFP growth mirrors what we think constitutes a sustainable scenario. It reflects something more than a prudent productivity projection. Note that this TFP long run rate of growth is rather lower than the average TFP growth rate of the

¹⁷ Investment both in construction and in durable equipment, national and imported, show positive seasonally adjusted variation rates in this sub period.

¹⁸ We could say that finished a first stage of the import substitution process. The following stage requires new investments, because it implies more complex production processes.

1990's (2.4% per year), and even less than the average TFP growth rate of the period 1960-1974 (2.1% per year).

This rate of growth of productivity is consistent with an ERER that is approximately 65% more depreciated than the observed RER of the 1990's. Why? Because some fundamental variables that determine the ERER experienced shocks that we consider, at least partly, as long lasting. We assume, following the consensus of international analysts that net private capital flow toward emerging markets will not come back, in the medium term, to the levels of the abundant years of the 1990's. As we previously mentioned, TFP growth in the 1990's was closely linked to imports of capital goods and FDI.

Lower net capital inflows forecast determine more depreciated long run ERER¹⁹. First, because lower inflows will imply higher local real interest rates, reducing consumption of all kind of goods, and consequently inducing a long run real exchange rate depreciation. Second, because of a weaker income effect that results from the lower prices of financial assets reducing the demand for non-tradable goods and depreciating the long term ERER. Lower net private capital inflow toward emerging markets will result in smaller sustainable current account deficit, less imports of capital goods and, therefore, slower TFP growth. Due to possible decreasing marginal returns to capital, we estimate this scenario with less net private capital inflows is deemed as relatively more sustainable.

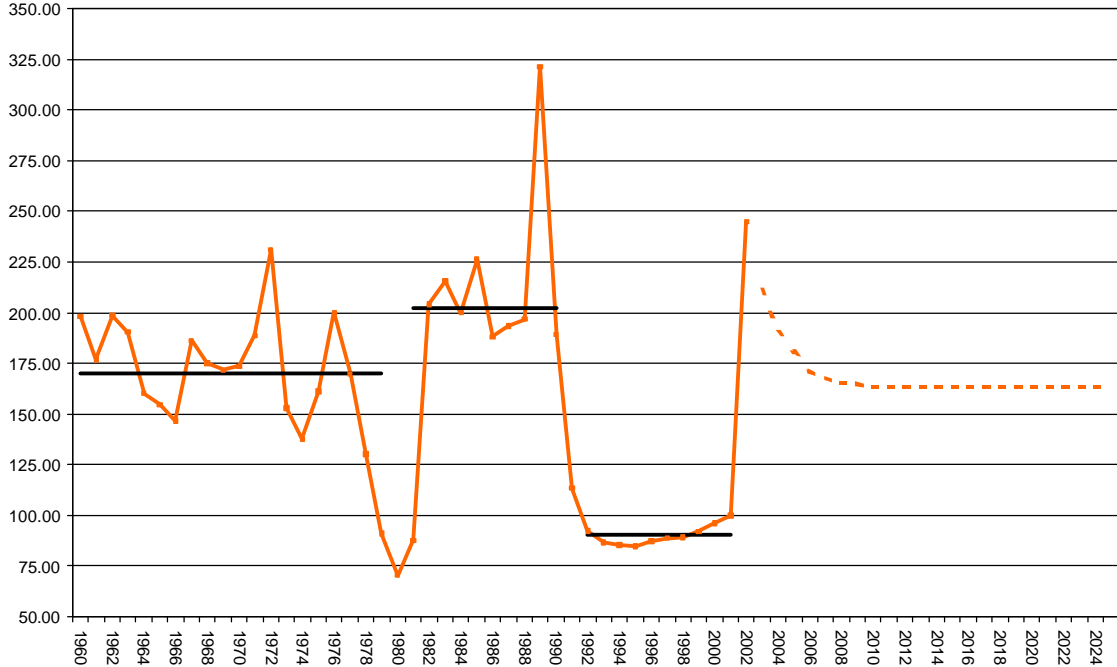
For year 2003, after the collapse, we assume a growth of 0.8% for the potential TFP, due to the historical evolution of the human capital²⁰. Since then potential TFP growth recovers gradually up to 1.5% for the estimated evolution of investment, particularly imports of capital goods.

To estimate projections of the actual GDP we assume again full utilization of capital stock. In the case of labor we assume an output elasticity of employment close to 1 in 2003 gradually decreasing to 0.5 in the "long run". Actual TFP growth rate reduces from 2.9% in 2003 to 1.5% in 2025. The assumptions are consistent with the evolution of the RER presented in Chart 8.

¹⁹ Our scenario does not consider significant changes in other fundamentals of the long run ERER, such as terms of trade, public expenditure/GDP and openness.

²⁰ An estimation of the Index of Quality Labor is presented in the Appendix.

CHART 8. ARGENTINA: REAL EXCHANGE RATE AR\$ / U\$S
Index 2001=100



These assumptions allow us to estimate projections of the GDP, actual and potential. Therefore we can estimate the gap. Chart 9 and Table 7 presents these projections. As we can observe the gap reduces from 2003 up to disappear in 2025.

CHART 9. ARGENTINA: OUTPUT GAP PROJECTION
In millions of 1993 pesos

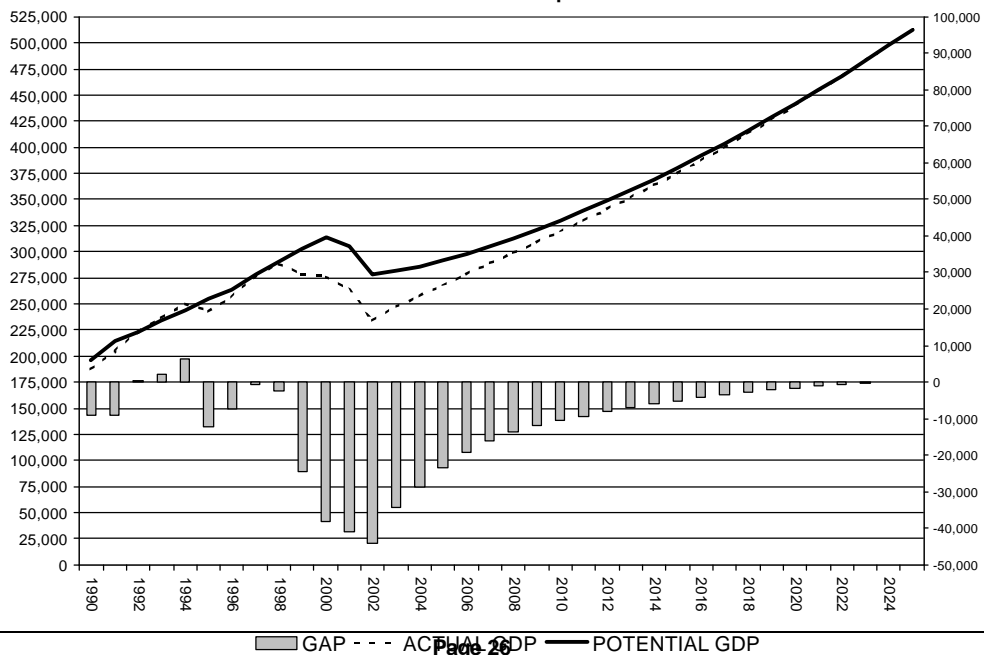


TABLE 7. ARGENTINA: OUTPUT GAP PROJECTIONS

YEAR	GDP		GDP		GAP	
	millions 1993 pesos	millions 1993 pesos	variation	variation	millions 1993 pesos	percentage of the actual GDP
	actual	potential	actual	potential		
1990	187,064	196,276			-9,212	-4.9%
1991	205,126	214,114	9.7%	9.1%	-8,988	-4.4%
1992	223,743	223,357	9.1%	4.3%	386	0.2%
1993	236,505	234,229	5.7%	4.9%	2,275	1.0%
1994	250,308	243,821	5.8%	4.1%	6,487	2.6%
1995	243,186	255,522	-2.8%	4.8%	-12,336	-5.1%
1996	256,626	263,866	5.5%	3.3%	-7,240	-2.8%
1997	277,441	278,224	8.1%	5.4%	-782	-0.3%
1998	288,123	290,407	3.9%	4.4%	-2,283	-0.8%
1999	278,369	302,687	-3.4%	4.2%	-24,318	-8.7%
2000	276,173	314,235	-0.8%	3.8%	-38,062	-13.8%
2001	263,997	304,838	-4.4%	-3.0%	-40,841	-15.5%
2002	234,676	278,673	-11.1%	-8.6%	-43,997	-18.7%
2003	247,583	281,964	5.5%	1.2%	-34,381	-13.9%
2004	257,487	286,089	4.0%	1.5%	-28,603	-11.1%
2005	267,786	291,359	4.0%	1.8%	-23,573	-8.8%
2006	278,498	297,862	4.0%	2.2%	-19,364	-7.0%
2007	288,802	304,905	3.7%	2.4%	-16,103	-5.6%
2008	298,910	312,556	3.5%	2.5%	-13,646	-4.6%
2009	309,073	320,816	3.4%	2.6%	-11,743	-3.8%
2010	319,273	329,704	3.3%	2.8%	-10,432	-3.3%
2011	329,812	339,099	3.3%	2.8%	-9,287	-2.8%
2012	340,694	348,844	3.3%	2.9%	-8,150	-2.4%
2013	351,919	358,944	3.3%	2.9%	-7,025	-2.0%
2014	363,489	369,406	3.3%	2.9%	-5,917	-1.6%
2015	375,403	380,446	3.3%	3.0%	-5,043	-1.3%
2016	387,658	391,954	3.3%	3.0%	-4,296	-1.1%
2017	400,253	403,801	3.2%	3.0%	-3,549	-0.9%
2018	413,182	416,006	3.2%	3.0%	-2,824	-0.7%
2019	426,442	428,580	3.2%	3.0%	-2,138	-0.5%
2020	440,024	441,534	3.2%	3.0%	-1,510	-0.3%
2021	453,921	454,879	3.2%	3.0%	-959	-0.2%
2022	468,121	468,628	3.1%	3.0%	-507	-0.1%
2023	482,614	482,792	3.1%	3.0%	-179	0.0%
2024	497,384	497,385	3.1%	3.0%	0	0.0%
2025	512,418	512,418	3.0%	3.0%	0	0.0%
2026	527,906	527,906	3.0%	3.0%	0	0.0%
2027	543,862	543,862	3.0%	3.0%	0	0.0%
2028	560,300	560,300	3.0%	3.0%	0	0.0%
2029	577,235	577,235	3.0%	3.0%	0	0.0%
2030	594,682	594,682	3.0%	3.0%	0	0.0%

Source: Dirección Nacional de Políticas Macroeconómicas

7. CONCLUDING REMARKS.

After the breakdown of the Convertibility output in Argentina is displaying signs of meaningful recovery. Although we present exercises with GDP growth of 5.5% for 2003, it could reach 7%, pretty much higher than the consensus expected at the beginning of this year. The shift of this recovery phase into a sustainable growth path rest on the solutions of some pending structural problems the economy faces and the set of macro policies underlying the growth process.

Along this paper we develop a set of reasons why the rate of output growth the Argentine economy can reach in the transition to a new “steady state” or long run GDP growth should be a smooth one.

In spite of the high output gap found through the traditional growth accounting exercise, different arguments recommend the adoption of gradual (“fine tuning”) aggregate demand policies.

First, after the collapse of the Convertibility, drastic changes in relative prices provoked “bottlenecks” in the production possibilities of some sectors, that are not observable in the estimation of aggregate potential output. Therefore post-collapse “overshooting” in relative prices should favor the adoption of gradual aggregate demand policies. This gradual recovery would allow the economy to smooth through time the discrepancies between positive aggregate output gap and bottlenecks in some sectors.

The second advice should be to avoid the harmful effects of productivity (TFP) volatility. During the first years of the 1990's, global liberalization of capital accounts cum abundance of capital in international markets (mainly due to expansive monetary policy in USA), increased net inflows toward the totality of emerging markets. Abundant and reduced cost of foreign capital over expanded aggregate demand and GDP growth. This over expansion transitory increased TFP. However, TFP growth was not sustainable, because it was the result of the temporary international abundance of capital. After the “sudden stop” in 1997, capital flows toward the totality of emerging markets (of which Argentina captured an important share) reduced from an average of 170 billion dollars between 1992-1996 to an average of 70 billion per year in the following five years. Particularly after the Brazilian devaluation, the “sudden stop” in capital inflows in a context of inflexible relative prices and rigid contracts, triggered a recession, TFP variation suddenly became negative, and the “equilibrium” real exchange rate depreciated, deepening the real overvaluation.

The above mentioned considerations, smoothing the effects of bottlenecks and avoiding unsustainable TFP growth, determine a baseline forecast for which actual and potential output growth is cautious (3% GDP growth in the long run), however consistent with a sustainable macro framework.

8. APPENDIX

8.1. A. *Alternative estimation of the TFP*

Instead of the Keynesian tradition, a second approach more along the neoclassical tradition considers potential output is derived from exogenous productivity shocks to aggregate supply that determine both long term growth and short term fluctuations. In this view, business cycle fluctuations are not necessarily the result of excesses or shortfalls of aggregate demand or by changes in macroeconomic policies, but the result from rational agents reacting to unexpected productivity shocks. Output is assumed to fluctuate around potential without significant divergences. In practice, potential output is obtained by smoothing actual output through different filters. After all, both theoretical approaches in practice use

Among the available set of statistical detrending methods, the Hodrick-Prescott filter (HP) is the most popular smoothing procedure. However, one major drawback of HP filter is the excessive smoothing of structural breaks that arises from setting the smoothing parameter in accordance with the USA business cycle. If there are structural breaks the use of the HP filter is inappropriate because of the removing of shifts that represent a change in the trend level or growth rate of potential output.

What happened with potential TFP after the crisis? Was its destruction permanent or temporal? Instead of estimate potential TFP through periods of linear trend it is possible to apply the Hodrick-Prescott filter. Table 8 presents three estimates of the potential TFP. The first one, called “
was calculated for the period 1960-2000, the second one “HP2001” include year 2001 and the last one “HP2002” also include year 2002²¹. The same estimates are presented in Chart 10.

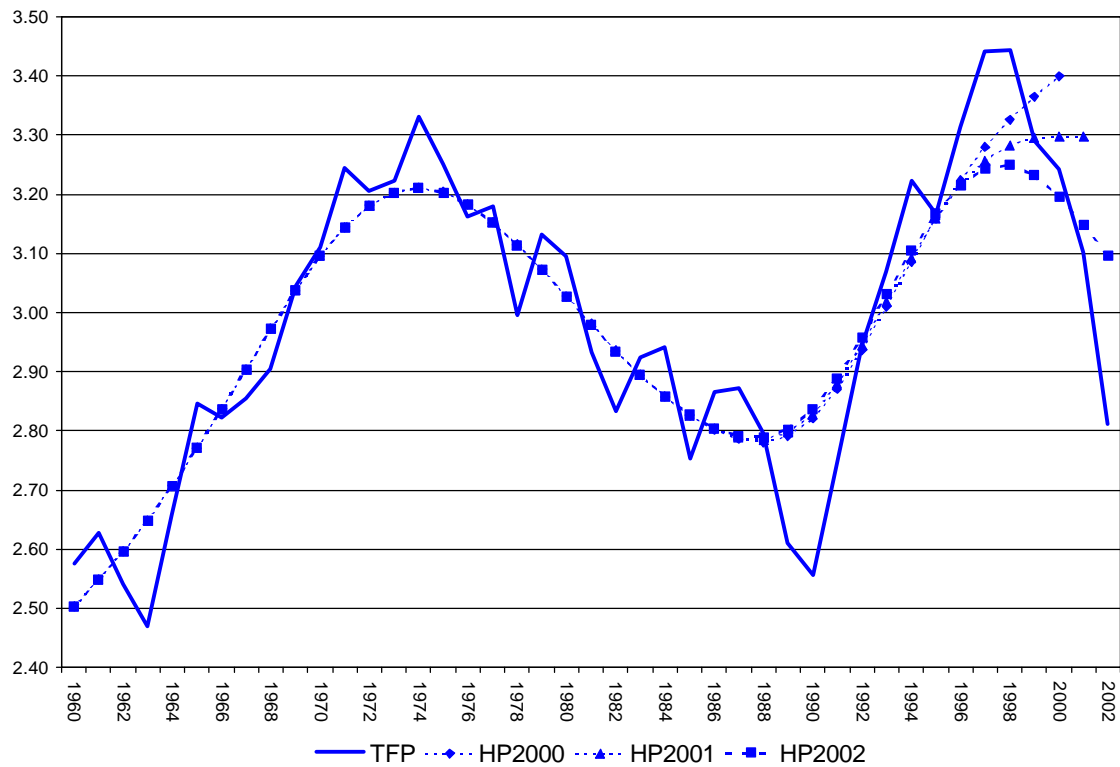
²¹ For the estimation of the Hodrick-Prescott filter coefficient λ was assumed to be 50 because of XXXX

TABLE 8. ARGENTINA: POTENTIAL TFP, alternative hypothesis

YEAR	TFP	HP2000	HP2001	HP2002
1960	2.5759	2.5020	2.5020	2.5020
1961	2.6276	2.5483	2.5483	2.5483
1962	2.5418	2.5961	2.5961	2.5961
1963	2.4698	2.6484	2.6484	2.6484
1964	2.6581	2.7072	2.7072	2.7072
1965	2.8467	2.7710	2.7710	2.7710
1966	2.8226	2.8371	2.8371	2.8371
1967	2.8548	2.9045	2.9045	2.9045
1968	2.9039	2.9718	2.9719	2.9719
1969	3.0464	3.0368	3.0368	3.0368
1970	3.1111	3.0956	3.0956	3.0956
1971	3.2448	3.1448	3.1448	3.1448
1972	3.2058	3.1811	3.1811	3.1811
1973	3.2232	3.2034	3.2034	3.2034
1974	3.3310	3.2110	3.2110	3.2109
1975	3.2507	3.2036	3.2035	3.2034
1976	3.1615	3.1831	3.1830	3.1828
1977	3.1795	3.1528	3.1525	3.1523
1978	2.9961	3.1151	3.1148	3.1145
1979	3.1313	3.0732	3.0728	3.0724
1980	3.0950	3.0278	3.0275	3.0270
1981	2.9319	2.9809	2.9806	2.9800
1982	2.8339	2.9358	2.9355	2.9350
1983	2.9237	2.8946	2.8946	2.8942
1984	2.9414	2.8577	2.8580	2.8579
1985	2.7537	2.8258	2.8267	2.8272
1986	2.8660	2.8015	2.8032	2.8045
1987	2.8714	2.7858	2.7886	2.7911
1988	2.7969	2.7811	2.7851	2.7892
1989	2.6105	2.7913	2.7969	2.8029
1990	2.5571	2.8210	2.8281	2.8362
1991	2.7494	2.8708	2.8791	2.8894
1992	2.9442	2.9362	2.9451	2.9573
1993	3.0702	3.0102	3.0186	3.0317
1994	3.2232	3.0862	3.0920	3.1043
1995	3.1664	3.1584	3.1588	3.1673
1996	3.3133	3.2240	3.2151	3.2157
1997	3.4412	3.2804	3.2572	3.2442
1998	3.4450	3.3266	3.2833	3.2494
1999	3.2892	3.3650	3.2953	3.2320
2000	3.2421	3.4003	3.2984	3.1967
2001	3.1028		3.2977	3.1490
2002	2.8111			3.0956

Source: Dirección Nacional de Políticas Macroeconómicas

CHART 10. ARGENTINA: Total Factor Productivity



This estimates allow as to decompose the “total” destruction of the TFP into a “permanent” destruction (reflected in the potential TFP) and a “temporal” or cyclical destruction (reflected in the actual TFP).

“Total” destruction was calculated over the actual TFP. “Permanent” destruction between 2000 and 2001 was estimates as the different between HP2001 in year 2001 and HP2000 in year 2000 as a percentage of actual TFP in year 2000. And analogous between years 2001 and 2002. “Temporal” destruction was estimated as the difference between total and permanent destruction each year. Decomposition of the TFP destruction is presented in Table 9.

TABLE 9. ARGENTINA: TFP DESTRUCTION

PERIOD	PERMANENT	TEMPORAL	TOTAL
2001/2000	-3.2%	-1.1%	-4.3%
2002/2001	-6.5%	-2.9%	-9.4%
2002/2000	-9.4%	-3.9%	-13.3%

Source: Dirección Nacional de Políticas Macroeconómicas

Now it is possible to calculate the potential output through this methodology for the potential TFP. These estimates are presented in Table 10.

TABLE 10. ARGENTINA: OUTPUT GAP, alternative hypothesis

YEAR	GDP	GDP	GDP	GDP	GAP	GAP
	millions 1993 pesos	millions 1993 pesos	variation	variation	millions 1993 pesos	percentage of the actual GDP
	actual	potential	actual	potential		
1960	104,222	101,108			3,114	3.0%
1961	111,624	108,130	7.1%	6.9%	3,494	3.1%
1962	109,853	112,139	-1.6%	3.7%	-2,286	-2.1%
1963	107,249	115,040	-2.4%	2.6%	-7,791	-7.3%
1964	118,295	120,573	10.3%	4.8%	-2,279	-1.9%
1965	129,135	125,877	9.2%	4.4%	3,258	2.5%
1966	129,969	130,918	0.6%	4.0%	-950	-0.7%
1967	133,407	136,134	2.6%	4.0%	-2,727	-2.0%
1968	139,141	142,915	4.3%	5.0%	-3,774	-2.7%
1969	151,021	151,177	8.5%	5.8%	-156	-0.1%
1970	159,144	158,062	5.4%	4.6%	1,082	0.7%
1971	165,129	163,808	3.8%	3.6%	1,321	0.8%
1972	168,560	169,717	2.1%	3.6%	-1,157	-0.7%
1973	174,872	175,293	3.7%	3.3%	-421	-0.2%
1974	184,325	179,599	5.4%	2.5%	4,725	2.6%
1975	183,233	182,727	-0.6%	1.7%	506	0.3%
1976	183,209	185,519	0.0%	1.5%	-2,310	-1.3%
1977	194,908	189,220	6.4%	2.0%	5,687	2.9%
1978	188,629	193,061	-3.2%	2.0%	-4,433	-2.3%
1979	201,865	194,846	7.0%	0.9%	7,019	3.5%
1980	204,952	198,030	1.5%	1.6%	6,922	3.4%
1981	195,487	198,577	-4.6%	0.3%	-3,091	-1.6%
1982	190,631	198,688	-2.5%	0.1%	-8,057	-4.2%
1983	198,644	196,789	4.2%	-1.0%	1,854	0.9%
1984	202,348	197,028	1.9%	0.1%	5,319	2.6%
1985	190,414	197,351	-5.9%	0.2%	-6,937	-3.6%
1986	202,331	199,461	6.3%	1.1%	2,870	1.4%
1987	206,932	202,446	2.3%	1.5%	4,486	2.2%
1988	203,954	204,920	-1.4%	1.2%	-965	-0.5%
1989	191,167	208,026	-6.3%	1.5%	-16,859	-8.8%
1990	187,064	209,515	-2.1%	0.7%	-22,452	-12.0%
1991	205,126	216,861	9.7%	3.5%	-11,735	-5.7%
1992	223,743	225,910	9.1%	4.2%	-2,167	-1.0%
1993	236,505	237,143	5.7%	5.0%	-639	-0.3%
1994	250,308	247,102	5.8%	4.2%	3,206	1.3%
1995	243,186	258,758	-2.8%	4.7%	-15,572	-6.4%
1996	256,626	266,318	5.5%	2.9%	-9,691	-3.8%
1997	277,441	278,967	8.1%	4.7%	-1,526	-0.5%
1998	288,123	288,310	3.9%	3.3%	-187	-0.1%
1999	278,369	296,788	-3.4%	2.9%	-18,419	-6.6%
2000	276,173	303,982	-0.8%	2.4%	-27,809	-10.1%
2001	263,997	297,793	-4.4%	-2.0%	-33,796	-12.8%
2002	234,676	279,732	-11.1%	-6.1%	-45,056	-19.2%

Source: Dirección Nacional de Políticas Macroeconómicas

This methodology tells a slight different story for the 90s and in 2002 it shows a gap pretty similar to the one presented formerly.

8.2. B. Estimation of the Index of Quality Labor

To measure the growth in human capital the index of Quality of Labor, (ILQ), is constructed. ILQ is defined as a weighted average of labor with different levels of salary:

$$ILQ_t = \sum_j w_j (L_j / L)$$

Where w_j are relative wages. It assumes each level of salary reflects a different level of education. ILQ is supposed to capture changes in the labor force productivity due to changes in the labor force composition.

The estimations for the Argentine economy, for the period 1980-2002, are presented in Table 11 and Chart 11.

CHART 11. ARGENTINA: Index of Quality of Labor
Index 1980 = 100

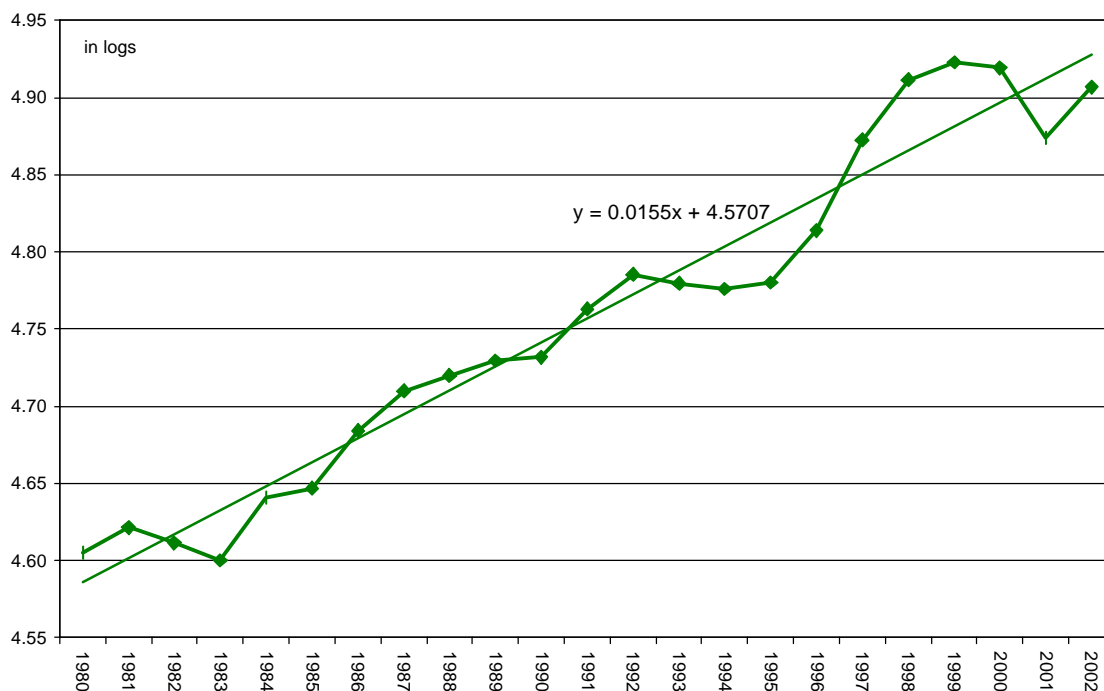


TABLE 11. INDEX OF QUALITY OF LABOR

YEAR	Labor	Index of Quality of Labor	Adjusted Labor	Labor	Index of Quality of Labor	Adjusted Labor
	thousand occupied	1980=100		variation	variation	variation
1980	8,419	100.00	8,419			
1981	8,410	101.64	8,547	-0.1%	1.6%	1.5%
1982	8,515	100.63	8,569	1.3%	-1.0%	0.2%
1983	8,629	99.51	8,587	1.3%	-1.1%	0.2%
1984	8,803	103.65	9,124	2.0%	4.2%	6.3%
1985	8,912	104.26	9,292	1.2%	0.6%	1.8%
1986	9,244	108.22	10,004	3.7%	3.8%	7.7%
1987	9,538	111.06	10,593	3.2%	2.6%	5.9%
1988	9,693	112.15	10,871	1.6%	1.0%	2.6%
1989	9,807	113.26	11,107	1.2%	1.0%	2.2%
1990	9,876	113.51	11,210	0.7%	0.2%	0.9%
1991	10,251	117.12	12,006	3.8%	3.2%	7.1%
1992	10,520	119.77	12,600	2.6%	2.3%	4.9%
1993	10,652	119.07	12,683	1.3%	-0.6%	0.7%
1994	10,618	118.65	12,598	-0.3%	-0.4%	-0.7%
1995	10,311	119.15	12,285	-2.9%	0.4%	-2.5%
1996	10,344	123.21	12,744	0.3%	3.4%	3.7%
1997	10,918	130.64	14,264	5.6%	6.0%	11.9%
1998	11,435	135.85	15,535	4.7%	4.0%	8.9%
1999	11,553	137.42	15,876	1.0%	1.2%	2.2%
2000	11,609	136.91	15,893	0.5%	-0.4%	0.1%
2001	11,589	130.84	15,163	-0.2%	-4.4%	-4.6%
2002	11,352	135.22	15,349	-2.1%	3.3%	1.2%

Source: Dirección Nacional de Políticas Macroeconómicas

Since 1980 both labor force and ILQ growth at an average annual rate of 1,4% annual resulting in a average annual growth of 2,8% for the Labor factor adjusted by quality.

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