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Economic Growth in Latin America and the Caribbean. Country Study for Argentina

The Role of Capital and Labor Reallocation in the Argentine Great Depression of the 1980's ¹

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Abstract

In the period 1974-1990 Argentina's income per capita fell by 25%. A Solow growth decomposition shows that at most one quarter of this fall can be explained by a reduction in the capital/labor ratio. A study of labor reallocation shows that between 1973 and 1993 labor reallocation explains 44% of the fall in output per worker, because employment expanded the most in sectors with a declining output per worker (wholesale and resale trade and community, social and personal services).

We show that policies that increase the cost of capital may explain these observations. Consider a two sector model where capital/labor substitution is low in the tradable goods sector and high in the non-traded goods one. If the steady state capital stocks falls, labor flows from the tradable goods sector to the non-traded goods one, leading to a reduction in income per capita, productivity and wages. Thus, policies that increase the cost of capital have a direct effect on output through the fall in the capital stock and an indirect effect that operates through a reallocation of labor induced by the fall in investment. The indirect effect can be quantitatively significant and it appears as a fall in the Solow residual in aggregate growth accounting exercises. During its Great Depression, Argentina increase the relative price of imported capital goods, violations of creditor rights increased the cost of borrowing, and expectations of policy reversals created anticipated capital losses.

KEYWORDS: Argentina, Growth Great Depressions, Irreversible Investment

JEL CLASSIFICATION CODES : E32, F43, N16, O4, O54

Executive Abstract

Over the period 1950-2001 the Argentine growth experience can be divided in three periods: 1950-1974, 1975-1990, and 1991-2001. In the first period, Argentine per capita income was growing at 1.77%, and during this whole period it remained at roughly 42% of US income. The economy was on a balanced growth path and the distribution of employment by industry was very stable. In the 1975-1990 period Argentina experienced a Great Depression. By 1990 total output was 40% below the 1935-1975 trend and income per capita was 23% below its 1975 value. During this period employment in the tradable goods sector of the economy was constant and all the net creation of employment occurred in the service sector. The share of employment in services increased by 20% of the labor force at the expense of employment in tradable goods. In the 1990's growth was restored.

Explaining the Argentine Great Depression of the late 70's and 80's is the focus of this paper. A Solow growth decomposition analysis shows that at most one quarter of the fall in output per worker can be explained by a reduction in the capital/labor ratio and the rest is explained by a fall in total factor productivity. A study of labor reallocation and productivity shows that output per worker decreased in those sectors where employment expanded the most (wholesale and resale trade and community, social and personal services), and that changes in the structure of employment account for 44% of the fall in output per worker. The fall in the capital stock and the reallocation of labor jointly explain about 70% of the fall in output per worker.

The behavior of the Argentine economy during the great depression may be explained with a two sector model with irreversible investment discussed in the paper. The two sectors in the model are a sector where capital/labor substitution is low (tradable goods) and another one where it is high (non-traded goods). In the model, an increase in the cost of capital that reduces investment induces labor to flow from the tradable goods sector (with low capital/labor substitution) to the non-traded sector (with high capital/labor substitution). The reallocation of labor induced by the fall in the capital stock reduces income per worker, productivity and wages. Thus, policies that increase the cost of capital have a direct effect on output through the fall in the capital stock and an indirect effect that operates through a reallocation of labor induced by the fall in investment. The indirect effect can be quantitatively significant and it appears as a fall in the Solow residual in aggregate growth accounting exercises.

Several policies in effect in the late 1970's and 1980's increased the cost of capital. Trade policy increased the cost of capital through two channels. Protectionist trade policies increased the cost of imported capital goods. The unsustainability of prohibitive protection induced expectation of policy reform that generated anticipated capital losses that increased the cost of capital. A debt default in 1982 and generalized macroeconomic instability resulted in very high interest rates throughout the 1980's.

1. Introduction

This paper describes the growth experience of Argentina between 1950 and 2000. Over this half century we can distinguish three distinct periods: 1950-1974, 1974-1990, 1990-2000 (see figures 1-3). The first period was relatively stable, there was balanced growth and Argentine per capita income grew at a rate that was comparable to that of the United States. In the second one per capita income fell by almost 25% in absolute terms and over 50% in relation to the United States and the rest of Latin America. In the last period growth was restored.

Due to its magnitude and persistence, the economic contraction experienced by the Argentine economy during the 1980's is one of the great depressions of the twentieth century (Kehoe and Prescott, 2002). Kydland and Zarazaga (2002) explain it through the lens of a neoclassical growth model. They estimate Solow residuals from the Argentine data and feed the estimated series as the exogenous total factor productivity in a neoclassical growth model. This exercise does well in explaining the behavior of aggregate variables during the 1980's. A problem with this approach is that since everything is explained by total factor productivity that is exogenous in the model, we learn very little about the factors that led to the dismal economic performance of Argentina.

In this paper we revisit the evidence on growth in Argentina looking at aggregate data and also at sectoral national income data. At the aggregate level we expand Kydland and Zarazaga's growth accounting exercise, incorporating a new series for human capital that we construct from household survey data. Qualitatively, results do not change much as we also find that most of the fall in output in the 1974-1990 period is accounted for by a fall in the Solow residual. The fall in capital per worker accounts for only 25% of the fall in output.

It is precisely in the 1974-1990 period where the sectoral composition of employment changed the most: as revealed by our analysis, overall reallocation was at least twice the average of the second half of the century. Along with this reallocation, output per worker fell in those sectors where employment expanded the most (wholesale and retail trade and personal, community and social services), explaining 44% of the decline in per capita output between 1973 and 1993. Thus, part of the fall in total factor productivity is explained by the flow of labor to the service sector.

In the second part of the paper we explore some possible causes of this dismal performance. In particular, we consider the role of high capital costs in explaining the low investment levels. Following a default on international debt, the 80's were a period of high interest rates. Indeed, during the period 1983-90 the average interest rate on Argentine government liabilities was 22%, more than twice the rate for the 1991-97 period.²

Capital costs were also high in Argentina as a result of tariffs and other trade barriers. Argentina's trade policy between 1950 and 2000 was very volatile and relied on several instruments: tariffs, quotas, export taxes, credit subsidies, etc. The paper provides an index of trade policy distortions that is a summary statistic for trade policy and data on the composition of imports and exports. This gives a proxy for the role of tariffs and quotas on the relative price of capital. Diaz Alejandro (1970) calculates a similar index of trade policy and argues that the distortive effect of protection on investment contributed to the slow relative growth of Argentina after the 1930's.

Using a neoclassical growth model we examine the effect of the increase in capital costs on investment. We find that the rise in interest rates can explain up to half of the decrease

²These high rates may be also linked to macro instability and the strong fiscal deficits of the period.

in the capital/output ratio during the 80's while the effect of tariffs and non-tariff barriers explains a further 30% of this decrease.

Finally, the third section of the paper provides a model to explain the fall in labor productivity and the corresponding sectoral reallocation. In this model, capital costs increase as the result of expectations of sharp policy reversals which lead to anticipated capital losses. The increase in capital costs results in a flow of labor from sector with high to low capital intensity followed by a decrease in labor productivity in the expanding sectors. Total factor productivity falls as a consequence of this reallocation.

2. Accounting for Growth: Factor Accumulation and Resource Allocation.

This section is divided in two parts. In the first part (section A) we present a standard Solow growth decomposition of the change in output per worker for the Argentine economy. The main contribution of this section relative to previous work is the introduction of a new series for human capital. The second part (section B) gives measures of labor reallocation across sectors during the period and provides a shift-share analysis to evaluate the impact of such reallocation on labor productivity.

A. Aggregate Growth Accounting

As it is standard we assume a constant returns to scale production function of the form

$$(1) \quad \frac{Y}{L} = A \left(\frac{K}{L} \right)^\alpha h^{1-a},$$

where Y denotes output, K is the capital stock, L is the number of workers, h is the average level of human capital and $0 < \alpha < 1$. The growth rate of output per worker then is

$$\hat{y} = \hat{A} + \alpha \hat{k} + (1 - \alpha) \hat{h},$$

where \hat{x} denotes the percentage change in x , and y and k are per worker variables.

The series for the average level of human capital is new and was computed using Argentina's permanent household survey with the methodology described in section 6. The rest of the data used in the growth accounting exercise is from Kydland and Zarazaga (2000), who provide their own time series for the capital stock in Argentina and use data on the number of employed workers based on Elias (1992) and Meloni (2000). The growth rates of output and capital per worker, our measure of h and the growth rate of L for the three periods identified in the previous section are depicted in the following table. The data on the growth of h in the 49-70 period is not available. In the period 1970-1974, h grew at an average rate of 2.91% per year.

Annual % Growth Rates				
	Y/L	K/L	h	L
49-74	1.77	3.26	-	1.69
75-90	-1.09	-0.70	1.43	1.15
91-97	4.35	2.12	0.63	1.85

The table shows that in the quarter century between 1949 and 1974 income per worker in Argentina grew at a reasonable rate, while there was substantial capital deepening. In the fifteen years following 1975 output and capital per worker fell significantly, and recovered in

the 1990's.

A growth accounting exercise is performed in the next table.

Aggregate Growth Accounting			
	Contribution K/L	Contribution h	TFP
average annual % growth rates (% of growth of y)			
49-74	1.30 (74%)	-	-
75-90	-0.28 (26%)	0.86 (-79%)	-1.67 (153%)
91-97	0.85 (19%)	0.38 (9%)	3.13 (72%)
Note:	labor share = 60%		

The growth accounting exercise indicates that the contribution of capital to the growth of output per worker explains 74% of growth in the first period with the remaining 26% attributed to the Solow residual (without human capital). If we assume that the growth rate of H for the 1970-1974 is a good description of the accumulation of H since 1949, the estimate of the growth rate of total factor productivity for this period is -1.29% per year. In the second period output per worker fell at an average of 1.09% per year for 15 years. The depletion of the capital stock accounts for 26% of the decline. After controlling for the growth of the average level of human capital aggregate total factor productivity during this period fell at an average annual rate of 1.67%, accounting in excess for the fall in output per worker. In the 1990's growth is restored with 19% of growth accounted for by the contribution of capital, 9% by the contribution of human capital, and the remaining 72% by the Solow residual.

B. Growth Accounting and Reallocation

The fall observed in total factor productivity between 1975 and 1990, at an average annual rate of 1.67% for 15 years is striking. sectoral reallocation can affect total factor productivity by shifting labor and capital among sectors with different productivities or relative prices. This section tries to quantify the importance of this effect. Unfortunately we do not have enough data to identify all sources of change in total factor productivity. For the period considered only data on value added and employment are available at the sectoral level with the exception of a few years (74-79 and 88-92). Capital stock data at the sectoral level is unavailable.

Employment Structure

	Primary	Manufacturing	Services
1950	19.9%	27.9%	52.1%
1960	18.2%	26.7%	55.1%
1970	17.5%	25.4%	57.1%
1980	12.7%	20.0%	67.4%
1987	11.4%	18.2%	70.5%
1993	6.7%	16.7%	76.6%
1997	7.5%	15.1%	77.4%

The extent of sectoral reallocation of labor in the time period considered is substantial. The table above indicates the progressive transition of employment from primary and secondary sectors to services. The largest increases in services occurred in the seventies and eighties. According to Table I, these changes were concentrated in trade (wholesale and retail) and Community, Social and Personal Services. These sectors account for most of the

increase in services (20.4 percentage points.). All of this increase occurred in the seventies and eighties.

Figure 4 depicts the evolution of employment in agriculture and mining, manufacturing, personal, community and social services, and other services. It shows that behind the changes in employment shown in the previous table there is a steady employment in the tradable-goods sector and growth of employment in services: all net entry to the labor force was absorbed by the service sector.

To measure the extent of sectoral reallocation, we construct the following index:

$$R_{t,t+1} = \frac{1}{2} \sum_i |l_{it} - l_{it+1}|,$$

where l_{it} is sector i 's share of total employment in period t . The reallocation index takes values between zero and one, where the extremes correspond, respectively, to no reallocation and to the case where all employment moves to a non pre-existing sector. An examination of the following table shows that the highest degree of reallocation occurred in the 70's and 80's, where growth rates were at the lowest.

Reallocation Index					
50-60	60-70	70-80	80-87	87-93	93-97
0.035	0.04	0.135	0.07	0.065	0.025

How much of the observed productivity changes can be explained by this high reallocation? The following shift-share analysis provides an answer. Output per worker can be written as the sum of output per worker in each sector of the economy times the share of

employment, i.e.

$$y_t = \sum_i l_{it} y_{it},$$

where the subindex i represents each of the goods or groups of goods produced in the economy, $l_{it} = L_{it}/L_t$ and $y_{it} = p_{it}Y_{it}/L_{it}$. This formula allows us to link the annual average rate of growth of output per worker between t and $t + n$ with our shift-share decomposition:

$$(2) \quad \frac{1}{n} \ln \frac{y_{t+n}}{y_t} = \frac{1}{n} \ln \frac{\sum_i l_{it} y_{it+n}}{\sum_i l_{it} y_{it}} + \frac{1}{n} \ln \frac{\sum_i l_{it+n} y_{it}}{\sum_i l_{it} y_{it}} + \frac{1}{n} \ln \frac{\frac{\sum_i l_{it+n} y_{it+n}}{\sum_i l_{it+n} y_{it}}}{\frac{\sum_i l_{it} y_{it}}{\sum_i l_{it} y_{it+n}}}.$$

The first term on the right hand side measures the within change or shift component, which is a weighted average of the increase in total factor productivity, capital per worker and average human capital in each sector as shown by

$$\frac{\sum_i l_{it} y_{it+n}}{\sum_i l_{it} y_{it}} = \sum_i \frac{p_{it} Y_{it}}{Y_t} \left(1 + \hat{A}_i + \alpha_i \hat{k}_i + (1 - \alpha_i) \hat{h}_i \right)$$

If there is balanced growth the within component should account for 100% of the change in output per worker. The second term in (2) corresponds to the between change or share component and it captures how much of the growth in y is due to pure reallocations of labor across sectors (output per worker in each sector constant). The third term in (2) is an interaction term, which is negative if there is a transfer of labor to sectors with relatively low rates of growth of output per worker. The interaction can be important and negative if labor flows from sectors in which output per worker rises to sectors in which it falls, as was the case in Argentina in the late 1970's and in the 1980's.

In the aggregate growth accounting the between component and the interaction term of the shift-share analysis appear as a change in total factor productivity as shown by

$$(3) \quad Y/L = \frac{\sum_i p_i A_i l_i F_i(k_i, h_i)}{k^\alpha h^{1-a}} k^\alpha h^{1-a},$$

where $F(\cdot, \cdot)$ is a linearly homogeneous monotonically increasing concave function. Aggregate total factor productivity can change due to changes in the allocation of resources across sectors, changes in relative prices and changes in sectoral total factor productivities. Our data analysis keeps changes in relative prices constant within sample periods, so we can identify the changes in aggregate total factor productivity that are due to the reallocation of labor from those that are induced by changes in A_i , k_{it} or h_{it} .

Table I shows the raw data used in the shift share analysis. The table shows the interaction between changes in the employment structure and changes in output per worker. The employment share of agriculture fell by 11% while productivity showed significant gains. In manufacturing employment fell by 8% and productivity was roughly constant. The biggest gains in employment shares occurred in wholesale and retail trade and in personal, community and social services, where output per worker experienced significant drops. It is also interesting to observe that in 1970 output per worker in the trade sector was higher than in agriculture and manufacturing and this was no longer the case in 1980. It is also worth noticing that the personal, social, and community service sector grew considerably despite being the least productive in the economy. This sector includes government employment. The financial sector is small in terms of employment, but is important because it experienced dramatic falls in productivity.

EMPLOYMENT STRUCTURE AND OUTPUT PER WORKER: 1950-1997

	Agriculture		Mining		Manufacturing		Electricity, Gas, Water		Construction	
	Share of Labor	Output per worker	Share of Labor	Output per worker	Share of Labor	Output per worker	Share of Labor	Output per worker	Share of Labor	Output per worker
1950	19%	93	1%	97	28%	100	1%	93	6%	77
1960	17%	115	1%	190	27%	140	1%	124	7%	70
1970	17%	112	1%	347	25%	213	1%	305	10%	79
1970	17%	119	1%	443	25%	169	1%	308	10%	95
1980	12%	137	1%	537	20%	163	1%	455	11%	91
1980	12%	74	1%	490	20%	181	1%	189	11%	98
1987	11%	82	0%	543	18%	179	1%	220	7%	115
1993	6%	137	0%	980	17%	183	1%	344	7%	93
1993	6%	95	0%	585	17%	130	1%	323	7%	92
1997	7%	89	0%	807	15%	153	1%	476	8%	96

	Wholesale and Retail Trade, Restaurants, and Hotels		Transport, Storage and Communications		Banking, Insurance and Real Estate		Community, Social and Personal Services		Output per worker
	Share of Labor	Output per worker	Share of Labor	Output per worker	Share of Labor	Output per worker	Share of Labor	Output per worker	
1950	10%	186	8%	110	1%	289	25%	63	100
1960	12%	192	8%	113	2%	263	25%	74	121
1970	11%	247	8%	142	2%	241	24%	85	154
1970	11%	209	8%	216	2%	520	24%	91	154
1980	17%	104	5%	267	4%	253	29%	65	129
1980	17%	133	5%	99	4%	405	29%	77	129
1987	20%	97	5%	108	5%	353	32%	70	120
1993	22%	87	6%	104	7%	262	33%	64	119
1993	22%	88	6%	141	7%	320	33%	69	119
1997	24%	93	6%	170	7%	372	33%	72	131

Note: NIPA accounts at prices of 1960, 1970, 1986, and 1993.
 There is no labor data by sectors for the periods 1974-1979 and 1988-1992.
 The sum of value added per sector at 1993 prices is 94% of GDP.

Figure 1:

Shift Share Analysis

	Output per worker	Within Change	Between Change	Interaction
50-70	2.14%	2.11% (93%)	0.08% (4%)	-0.05% (-2%)
73-80	-2.50%	-1.40% (56%)	0.36% (-15%)	-1.46% (59%)
80-87	-0.96%	-0.80% (83%)	0.07% (-8%)	-0.23% (24%)
87-93	-0.16%	-0.01% (8%)	0.29% (-180%)	-0.44% (271%)
80-93	-0.59%	-0.33% (56%)	0.32% (-54%)	-0.57% (97%)
93-97	2.44%	1.07% (44%)	-1.84% (-75%)	3.21% (131%)

Note: Average annualized rates of growth (% of total change)

The table above gives the shift-share decomposition of productivity growth described in (2). The qualitative changes in output per worker mimic the pattern of changes in total factor productivity given in section A, with positive growth until 1973, followed by negative growth in the late 1970's and in the 1980's, and again positive growth in the nineties.

The remarkable thing about the 1950-1970 period is that most of the change in output per worker is explained by the within component. Argentina during this period was close to a balanced growth path and the total factor productivity estimated by the Solow residual is not capturing the effect of reallocation. Capital deepening and growth in productivity accounts for most of the growth of the Argentine economy in this period.

In the twenty years following 1973 the growth of output per worker was negative and reallocation played an important role in reaching this result. Reallocation explains 44% of the fall in output per worker in 1973-1980, 17% in 1980-1987 and 92% in 1987-1993. The combined effect of reallocation induced an average annual fall in output per worker of 1.1% per

year in the period 1973-1980. For the 1980-1993 period output per worker fell at an average annual rate of -0.59%, of which -0.26% (or 44% of the total change) is due to reallocation effects. Thus, for the period 1973-1993, 44% of the change in output is accounted for by reallocation effects. This number is significantly larger than the 25% attributed to capital in the aggregate growth accounting exercise.

Most of the within decrease of output per worker in the late seventies and eighties is explained by a fall of 2/3 in the retail trade sector productivity and a fall of 1/3 in the productivity of community, social and personal services. These sectors increased their share of employment from, respectively, 11% and 24% of the labor force in 1970 to 20% and 32% in 1987. The large negative value of the interaction term is capturing the fact that the service sector absorbed a large fraction of the labor force while output per worker in that sector fell.

In the nineties growth and investment are restored, but the reallocation effects are still important. The overall reallocation effect induced an increase in aggregate output per worker of 1.37% per year, which account for 56% of the total change. The within change was of 1.07% per year and accounts for remaining 44% of the increase in output per worker.

3. Increase in the cost of capital and the fall of investment

Following the default on foreign debt, interest rates increased dramatically in the 1980's. During this period, tariffs and other trade barriers also contributed to the rise in the cost of capital. This section provides evidence on the rise in the cost of capital and evaluates the impact of this change on investment in a standard Neoclassical growth model.

The effect of changes in the relative price of investment goods and in the interest rates is calculated with the methodology described in Hopenhayn and Neumeyer (2000). The

expression for the equilibrium capital stock implies that the elasticity of the capital stock with respect to the interest rate is

$$\frac{\partial k_i}{\partial r} \frac{r}{k_i} = -\frac{1}{1 - \alpha_i} \frac{r}{r + \delta}.$$

For calculating the elasticity of the steady state equilibrium capital stock with respect to tariffs it is necessary to distinguish between tariffs on capital goods, I , which reduce investment, and tariffs on final goods that increase investment. The expression for the equilibrium capital stock in each sector implies that the elasticities of the capital stock in each sector with respect to tariffs on investment goods, τ_I , and with respect to protective tariffs, τ_i are

$$\frac{\partial k_i}{\partial \tau_I} \frac{\tau_I}{k_i} = -\frac{1}{1 - \alpha_i} \frac{\tau_I}{1 + \tau_I} \text{ and } \frac{\partial k_i}{\partial \tau_i} \frac{\tau_i}{k_i} = \frac{1}{1 - \alpha_i} \frac{\tau_i}{1 + \tau_i}.$$

A. The rise in interest rates

Throughout the second half of the twentieth century the Argentine economy experienced repeated violations of creditor's property rights. In the period up to 1977, ceilings on interest rates were standard and nominal financial contracts were eroded by inflation. Credit at negative real interest rates was allocated by the government that transferred resources from depositors to privileged debtors. These credit subsidies were part of the import-substitution industrialization policy. In 1977 financial markets were liberalized with the resulting increase in real interest rates. Real interest rates further increased after Argentina defaulted on its public debt in the early 1980s. Our analysis focuses on this period.

Real interest rates in Argentina are hard to measure since regulations make local

interest rates hard to interpret and the volatility of inflation makes measuring expected inflation a tricky business. For the period 1983-1997 we use the measure of interest rates in Alvarez-Neumeyer (2000), which was successfully used to explain Argentine business cycles in Neumeyer-Perri (1999). The average interest rate for the period 83-90 was 22% per year, and for the period 91-97 it was 10%. As this is also the interest rate that Kydland and Zarazaga calibrated for Argentina's steady state, we assume that before 1974 Argentina's rate was also 10%. Following Kydland and Zarazaga we set the depreciation rate at 9%. Using these parameter values the elasticity of the capital labor ratio with respect to the interest rate in the mid seventies was 0.17. This implies that an increase in the interest rate of 100% should result in a fall of the capital stock of 17%. As the index of the capital labor ratio in 1991 was 34% lower than the average value for the 1962-1984 period (39% lower than its 1981 value) we conclude that interest rates explain up to 50% of the decline in Argentina's capital labor ratio. The value of the elasticity in the 1980's when interest rates were around 20% is -0.3 , and hence the effect of a fall in the interest rate of 50% would induce a rise in the capital labor ratio of 15%, which is actually very close to the 13% increase observed between 1991 and 1997.

B. The effect of trade policies

The protectionist policies of last century relied on a complicated battery of instruments. The next two sections provide a summary measure of protection through a trade policy index that captures the joint effect of these policies on the relative price of imported goods, and an evaluation of the impact of these trade policies effect on the cost of capital and on investment.

Argentine Trade Policy: 1950-2000

During the period extending from 1950 to 1976 Argentina's development strategy was import substitution industrialization. This development strategy started in the 1930's and was reinforced in 1943. Economic policy served this development strategy through the use of commercial policy, exchange rate controls, the tax structure and credit subsidies. In the first stage these policies stimulated the creation of industries that substituted imports of final goods, and in later stages they protected intermediate inputs and capital goods, including cars, steel, and petrochemicals. In the period 1976-1981 there was a brief trade liberalization followed by protectionist policies in 1981-1991. The dismantling of the protectionist regime of the 1980's started in 1988 and consolidated in the 1990's. This section describes Argentina's trade and exchange rate policies and constructs an index that is used as a summary statistic of Argentina's trade policy stance.

Import substitution policies included a battery instruments to induce resources to flow to import competing industries. These policies included export taxes, price ceilings on exportable goods, import tariffs, quantitative restrictions on imports, export subsidies for non-traditional exports, multiple exchange rates with higher rates for imports and "non-traditional" exports and lower rates for exportable goods, credit subsidies that favored import competing industries.

The legal tariff structure in 1959, 1969,1976,1988,1991,1993, and 1997 is shown in following table. The table shows the high levels of protection enjoyed by argentine industry until the late 1980's. It also shows that although tariffs on intermediate imported imports were lower than on consumer goods they remained high. The protection of intermediate goods increased the local cost of production, making the domestic industry less competitive

internationally. As a result a complex system of tax rebates for exporters was introduced (See Schydlosky (1989)).

Legal Tariff Rates (in percentage)

	1959	1969	1976	1988	1991	1993	1997
Non Durable Consumer Goods	197	142	200	53	25	30	23
Durable Consumer Goods	198	142	149	63	21	20	19
Intermediate Goods	118	102	86	44	17	20	14
Machinery	147	93	87	57	22	8	14
Transport Equipment	188	124	132	57	27	9	21
Weighted Average	141	107	99	48	19	17	16
Mean	145	103	97	52	19	17	15
S.D.	56	42	41	16	5	8	5
Dispersion	38	41	42	30	27	44	30

Source: Berlinski (2000). Weighted based on the production for each good.

The legal tariff structure is a bad measure of protection since the trade regime also included quantitative restrictions on imports, exemptions on multiple goods, and a system of trade taxes and subsidies embedded in the exchange rate regime. Figure 5 on implicit tariffs shows the implicit tariffs and export taxes measured as the ratio between tariff revenues (export taxes) and imports (exports). It shows the role of significant exceptions in the trade regime: even though average legal tariffs until 1976 were in the order of 100%, tariff revenue never exceeded 25% of the value of imports. Moreover, this measure of trade policy does not

capture the effect of the severe quantitative restrictions on trade imposed in the 1973-1976 period and in the 1980's.

The following tables on the composition of imports and exports shows that Argentina exports mainly agricultural goods. The share of agriculture in total exports was 93% in 1963, 85% in 1970 and 71% in 1980. Moreover, after over 40 years of import substitution only 23% of exports involved manufactured goods in 1930.

Composition of Exports

	Agric Raw Material	Food	Fuel	Ore and Metals	Total Agriculture	Manufactures
1963	20%	72%	1%	1%	93%	6%
1970	11%	74%	0%	0%	85%	14%
1980	6%	65%	3%	2%	71%	23%
1990	4%	56%	8%	2%	61%	29%
1997	3%	49%	12%	2%	52%	34%

Source: World Development Indicators 1999.

The table on the composition of imports illustrates the effects of the import substitution policies. With the short exception of the trade liberalization experiment in 1976-1981 the share of imports of consumption goods was under 5%, compared to 41% in 1925 and magnitudes in the order of 20% during the trade liberalizations of 1976-1981 and in the 1990's.

Composition of Imports

	Capital	Intermediate	Oil and	Consumption
	Goods	Inputs	Lubricants	Goods
1925	17%	37%	5%	41%
1950	20%	54%	12%	13%
1960	34%	52%	12%	2%
1970	22%	69%	5%	5%
1975	14%	69%	13%	3%
1980	23%	49%	10%	18%
1985	17%	66%	12%	5%
1990	23%	49%	10%	18%
1999	27%	48%	3%	21%

Source: Berlinsky (2000).

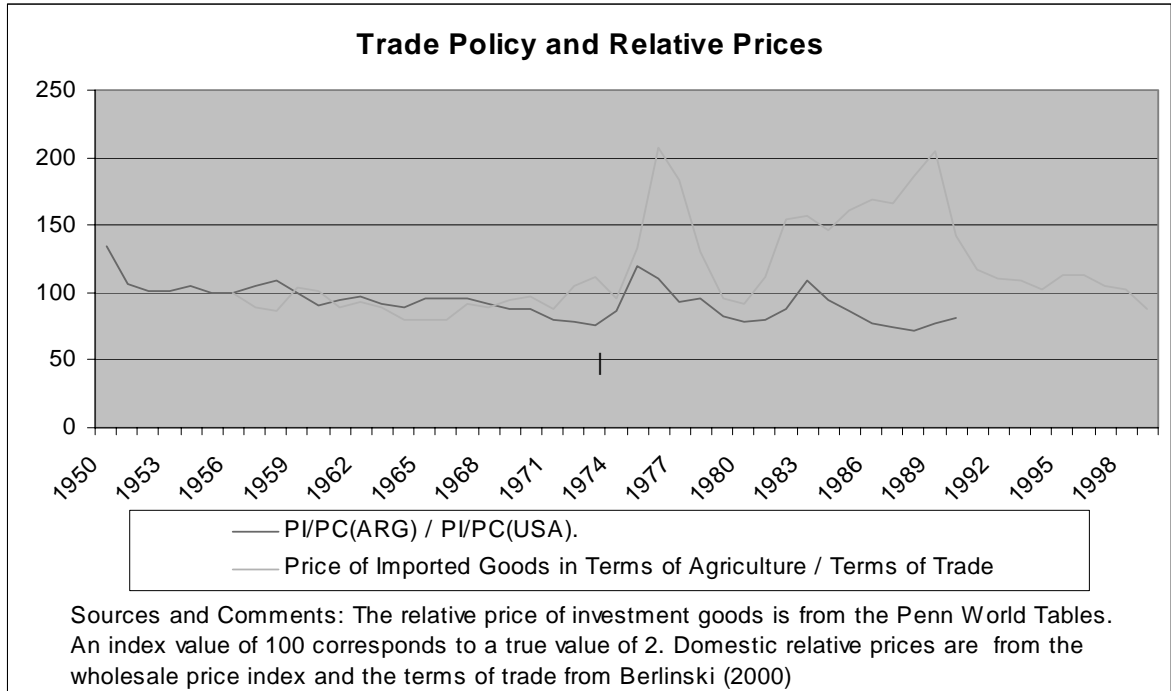
Given the composition of exports the combination of all the distortive policy interventions will be summarized by the trade policy index (TPI)

$$\begin{aligned}
 \text{trade policy index} &= \frac{\frac{\text{Domestic Price of Imported Goods}}{\text{Domestic Price of Agricultural Goods}}}{\frac{\text{International Unit Price of Imports}}{\text{International Unit Price of Exports}}} \\
 &= \frac{E_m (1 + \tau_m)}{E_x (1 + \tau_x)},
 \end{aligned}$$

where E_m/E_x is the ratio of the exchange rate applicable to producers of goods m and x , when there are multiple exchange rates. This is our preferred strategy for measuring trade policies, which looks directly at relative prices.

The blue line in figure 6 on trade policy and relative prices shows the value of this

index for the period 1956-1999. The index shows that despite the apparent volatility of trade policies during the 1950's and 1960's the trade policy index remained fairly stable. This changed on the 1974-76 period due to the imposition of quantitative restrictions, export taxes and multiple exchange rates in 1974-1976. Figure 6 also shows the short lived trade liberalization experiment of 1977-1980, the strongly protectionist policies of the 1982-1989 period, and the trade liberalization of the 1990's. According to the trade policy index the level of protection of the 1990's is similar to that of the 1950's and 1960's. This is at odds with the data in table on the composition of imports that shows a significant rise in the imports of consumption goods and with the data on legal tariffs in the table on Legal Tariffs. A possible explanation is that since in the 1990's the share of agricultural goods in exports fell to 52% due to the increase in the exports of oil and manufactured goods, the index is measuring the price of exports with error. The pink line shows the ratio between the relative price of investment goods in terms of consumption goods in Argentina and the United States. Changes in this variable can be interpreted as changes in distortions to invest, such as import tariffs on capital goods. The graph shows that the relative price of investment goods in Argentina peaks in 1975 and 1983, and these peaks coincide with protectionists spurs.



Trade Policy and Relative Prices

The impact of trade policies on investment

In order to evaluate the effects of trade policies it is necessary to distinguish among the producers of the three different goods: exportables, importables, and non-tradables.

Assuming investment goods are imported, the direct effect of tariffs on the producers of imported goods is nil since the negative effect of the tariff is offset by increased protection. For the other two sectors, our evidence suggests that tariffs on capital goods in the 1974-1990 period were twice the ones in the 1960-1974 period. This is inferred from the doubling of protection implied by the trade policy index in figure 6, which can also be seen in the following table.

Trade Policy Index					
1960-1965	72.47	1981-1985	149.12	1960-1974	75.32
1966-1970	77.21	1986-1990	176.29	1975-1990	149.50
1971-1975	88.07	1991-1995	126.84	1991-2000	117.52
1976-1980	126.69	1996-2000	108.21		

The implicit tariff rate in the tariff revenue to total imports ratio increased from 10% in 1973 to 20% in 1980 and 1986. Given that our measure of the elasticity of the capital labor ratio with respect to tariffs on capital goods is 0.15 and the estimated fall induced in the capital labor ratio in these sectors by the increase in tariffs is 15%. As services and primary products account for about 2/3 of output, assuming the share of the capital stock in these sectors equals the share in output, the fall in the aggregate capital labor ratio stemming from the tariff on investment goods is 10%.

There is still a 10% fall in the capital stock that needs to be explained. Potential candidates to explain this are higher export taxes (small because primary products account for a small share of GDP), removal of credit subsidies in import competing sectors, expectation of policy reversals, especially in the protected import competing sector.

4. Factor substitution and incredible protection

In this section we sketch a model that tries to capture what we think are essential features of the Argentine economy that will help us to understand the *Great Depression* of the 80's. We need to explain the fall in aggregate output per worker, why capital per worker fell and why the share of employment in sectors with falling productivity increased and why it declined in sectors with rising productivity. This is the model that we will use to quantify

the effects of expected policy reversals.

In a standard neoclassical growth model, policies and distortions can explain only the change in capital per worker but not the changes in employment shares underlying the decline in total factor productivity. Hence departures from the standard one sector growth model are necessary. The model we use departs from the neoclassical model in several dimensions: (i) it assumes that investment is irreversible, (ii) it assumes that protectionist policies may become unsustainable, so agents expect that a trade liberalization will occur³, and (iii) it assumes that there is less substitutability between factors of production in the tradable sector than in the non-tradable one.

The irreversibility of investment combined with the expectation of a trade reform imply that the cost of investment should also include an option value of waiting that captures the expected capital loss of installed capital arising from a trade liberalization. In the protected sectors a move towards free trade devalues installed capital by reducing the present value of future profits, in the competitive sectors free trade lowers the value of imported capital that if freely imported after the reform. We show that the effects of these two assumptions can be significant.

The assumption about the substitutability of factors implies that when government policies reduce the equilibrium capital-labor ratio, labor will flow from the more rigid sectors to the more flexible ones. To be precise, we consider an economy that produces two tradable consumption goods, x and m , a tradable investment good, i , and a non traded consump-

³In particular, we consider the effect of increasing the probability of a drastic change in trade policy that would bring an end to protection. It is interesting to note that the 90's were indeed a period where protection was substantially decreased in many Latin American economies. Moreover, Argentina had already experienced in the mid-seventies a period of substantial tariff reductions and currency appreciation that lowered considerably the price of imports.

tion good, n . The technology to produce each of the goods is described by the production functions:

$$x = \min(a_x K_x, l_x)$$

$$m = \phi_m \min(a_m K_m, l_m)$$

$$i = \phi_i \min(a_i K_i, l_i)$$

$$n = A_n K_n^\alpha l_n^{1-\alpha}.$$

Tradable goods are produced with a Leontieff technology while services are produced with a Cobb-Douglas one. The idea is that in the non tradable sector -mainly services- there is more scope of substituting labor for capital. As a result, if the desired capital stock falls in the tradable sectors, labor will flow from these sectors to the non traded sector. As the marginal product of labor is decreasing in labor and capital in this sector falls, output per worker in the non-traded sector falls. Therefore, this flow of resources shows up as a negative interaction term in the shift-share decomposition presented in (2).

The capital accumulation technology is

$$(4) \quad \dot{K}_j(s_t) = i_j(s_t) - \delta K_j(s_t) \quad \text{for all } j = x, m, n, i$$

$$(5) \quad i_j(s_t) \geq 0 \quad \text{for } j = x, m, n, i$$

where K_j is the stock of capital in sector j and δ is the instantaneous rate of depreciation.

The non-negativity of investment is capturing the irreversible nature of investment mentioned above.

The international prices of the tradable goods are normalized to be

$$p_x^* = p_m^* = p_i^* = 1,$$

and the international risk-free interest rate is assumed to be r . Under these assumptions there is complete specialization in production and we assume that under free trade it is inefficient to produce goods m and i . This requires to restrict the technological parameters to satisfy

$$\begin{aligned} \phi_m &< 1 + \left(\frac{1}{a_m} - \frac{1}{a_x} \right) (r + \delta) \\ \phi_i &< 1 + \left(\frac{1}{a_i} - \frac{1}{a_x} \right) (r + \delta) \end{aligned}$$

Under a protectionist regime, tariffs τ_m and τ_i are levied on goods m and i so that it becomes profitable for domestic firms to produce these goods at home. For simplicity we will assume that tariffs are prohibitive. The domestic price of imported goods is

$$1 \leq p_m \leq 1 + \tau_m \text{ and } 1 \leq p_i \leq 1 + \tau_i.$$

The expectation of a trade reform under protection implies that the protectionist policy is uncertain since tariffs may be removed. Denote the state of the economy by s , with

$$s = \begin{cases} P & \text{if there is protectionism} \\ F & \text{if there is free trade} \end{cases}$$

At any instant, the probability that the protectionist regime will end and there will be a switch to free trade is λ .

Household preferences are given by

$$(6) \quad E \left[\int_0^{\infty} u(x(s_t), m(s_t), n(s_t)) e^{-r t} dt \right].$$

where r is the household's discount rate that is assumed to be equal to the international interest rate and u is an additive logarithmic function.

The private sector's problem is to maximize (6) subject to the capital accumulation (4) and irreversibility (5) constraints, the household's budget constraint

$$(7) \quad \begin{aligned} \dot{b}(s_t) = & r(s_t) b(s_t) + a_x K_x(s_t) + p_m \phi_m a_m K_m(s_t) + p_n(s_t) f(K_n(s_t), l_n(s_t)) \\ & + p_k(s_t) [\phi_i a_i K_i(s_t) - (i_x(s_t) + i_m(s_t) + i_n(s_t))] + \tau \\ & - [x(s_t) + p_m(s_t) m(s_t) + p_n(s_t) n(s_t)] \end{aligned}$$

and the labor constraint

$$(8) \quad 0 = l - a_x K_x(s_t) - a_m K_m(s_t) - a_i K_i(s_t) - l_n.$$

The first constraint (7) is the household's budget constraint. The private sector accumulates bonds denominated in the export good, which pay an interest rate $r(s_t)$, from the income of producing the four goods, interest income and government transfers, τ , net of the expenditures in consumption and investment. The capital accumulation and irreversible investment constraints are standard. The constraint on labor uses the fact that if labor is optimally set, $l_x = a_x k_x(s_t)$, $l_m = a_m k_m(s_t)$ and $l_i = a_i K_i(s_t)$.

The government budget constraint is

$$\tau = \tau_m \max [(m - \phi_m a_m k_m (s_t)), 0] + \tau_i \max [(i - \phi_i l_i), 0]$$

For simplicity we assume that under protection the country has no access to loans from the rest of the world and under free trade it faces an inelastic supply of loans at the international interest rate. Therefore, aggregate consistency in financial markets requires that under protection $\dot{b} \geq 0$ and under free trade $r^F = r$.

In the non-traded goods sector aggregate consistency requires

$$n(s_t) = f(K_n(s_t), l_n(s_t)).$$

For an interior solution, the first order conditions for capital accumulation in sectors $j = x, m$ and i under free trade and protection satisfy⁴

$$\begin{aligned} r + \delta &= a_j (\phi_j - w^F) \text{ under free trade and} \\ (r + \delta) p_i^P &= a_j (p_j^P \phi_j - w^P) + \lambda \left(\frac{u_x^F}{u_x^P} - p_i^P \right) \text{ under protection.} \end{aligned}$$

These first order conditions state that the marginal cost of investing an extra unit of capital in sector j have to be equal to the marginal benefit. Under free trade, the price of the

⁴Outside of steady state the foc are

$$\begin{aligned} (r + \delta) q_j^P &= a_j (p_j^P \phi_j - w^P) + q_j^P \left(\frac{\dot{q}_m^P}{q_m^P} + \frac{\dot{u}_x^P}{u_x^P} \right) + \lambda \left(\frac{u_x^F}{u_x^P} - q_j^P \right) \\ q_j^s &\leq p_i^s; \quad i_j^s \geq 0; \quad (p_i^s - q_j^F) i_j^F = 0 \end{aligned}$$

investment good is $p_i^F = 1$ so the cost of capital is $r + \delta$. With the Leontieff technology, the marginal gain of an additional unit of capital is the marginal product of capital, $\phi_j a_j$ net of the cost of hiring a_j additional units of labor. Under protection, the cost of capital is higher since its price is higher. The expected marginal profit of capital is smaller due to the expected capital loss that occurs if there is a trade liberalization. The capital loss is equal to the difference between the value of a unit of capital if there is a trade reform in terms of the x good under protection u_x^F/u_x^P and the price of capital under protection, p_i^P . Observe that increases in the probability of a trade reform reduce the incentives to invest.

In the non-tradable sector, the analogous conditions are

$$\begin{aligned} r + \delta &= p_n^F \frac{\alpha A_n}{k^{1-\alpha}} \text{ under free trade and} \\ (r + \delta) p_i^P &= p_n^P \frac{\alpha A_n}{k^{1-\alpha}} + \lambda \left(\frac{u_x^F}{u_x^P} - (1 + \tau_i) \right) \text{ under protection,} \end{aligned}$$

where the term $\alpha A_n/k^{1-\alpha}$ represents the marginal product of capital in the n sector. Finally, the first order conditions for labor in the n sector is

$$p_n^s (1 - \alpha) A_n k_n = w^s.$$

Observe that expectations of policy reversals, in this example increases in λ , reduce the incentives to invest.

We solve the model for a steady state with positive investment.

Results.

We have performed some preliminary experiments with this model to check its poten-

tial to shed light on the Argentine experience. The results are encouraging.

In the experiments we compare the stationary equilibrium in an economy with credible protection with the ones that arise when there is a 5% chance of a trade liberalization ($\lambda = 0.05$) and with the allocation under free trade. The following table summarizes our main preliminary findings.⁵

Simulation Results							
	Credible	Incredible	Free		Credible	Incredible	Free
	Protection	Protection	Trade		Protection	Protection	Trade
l_x	0.11	0.086	0.623	K_x	0.712	0.557	4.048
l_m	0.116	0.093	0	K_m	0.377	0.302	0
l_i	0.304	0.23	0	K_i	0.247	0.187	0
l_n	0.471	0.592	0.377	K_n	0.534	0.369	0.66
				K	1.87	1.415	4.708
p_i	1.141	1.008	1	GDP	0.472	0.357	0.821
p_n	0.854	0.649	1	TFP	0.356	0.305	0.408
w	0.259	0.161	0.35	K Share	0.452	0.549	0.446

The first column reports the equilibrium allocation when there are prohibitive tariffs and no expectation of a policy reversal. In the second column, government policy is the same as under protection, but agents think that there is a 5% chance of a trade liberalization. The

⁵For this preliminary experiment we picked parameters for the model that we think are reasonable. In the non-traded sector $A_n = 0.553$ and $\alpha = 1/3$. The capital share in the x sector is 0.64 and $a_m = 2 a_x$, $a_i = 4 a_m$. The excess cost over the international price of producing goods i and m goods is 40% and 50%, respectively. Preferences are $U = 0.3 \ln(x) + 0.2 \ln(m) + 0.5 \ln(n)$.

last column corresponds to the allocation under free trade.

The effect of the expectation of a policy reversal in this example is large and consistent with the Argentine 1975-1990 experience. When λ increases to 5% the capital stock declines in all sectors, with the aggregate capital stock falling by 24%. This confirms the intuition that expectations of policy reversals can generate large changes in relative prices that significantly reduce the demand for capital when investment is irreversible.

The fall in the capital stock induced by the expected policy reversal combined with the extreme assumption about the substitutability of factors of production in the traded sector and in the non-traded sector generates labor flows similar to those observed in Argentina. The employment share in services increases by 12% (the increase in the data is almost 20%) and at the same time output per worker in this sector falls.

The combined effect of the labor reallocation and of the fall in the capital per worker induces a 24% decline in GDP. An observer that looks only at aggregate data could incorrectly infer that a shock to total factor productivity is responsible for the fall in output. Indeed, if one were to calculate total factor productivity using the share of capital in GDP under the credible protection regime (45.2%) and data on the aggregate capital stock, a fall of 14% would be obtained.

In this model uncertainty about government policies is responsible for all of the loss in output since nothing else changes. However, as the previous paragraph shows, the aggregate data will look as if a shock to total factor productivity caused the fall in output. What is actually happening is that the expectations of policy reversals create a deleterious business environment that induces capital per worker to fall since installed capital is hard to unbolt. The resulting fall in output is much larger than the direct effect of the lower capital stock

because the latter stimulates a reallocation of labor that further reduces output per worker. This labor reallocation appears as a fall in total factor productivity in a Solow type growth accounting exercise.

5. Final Remarks

This paper has examined Argentina's Great Depression of the 80's in some detail. A standard Solow growth-decomposition shows the factor accumulation explains only one fourth of the lack of growth during this period. The rest remains unexplained. Our view on this matter is that the tremendous reallocation that took place during this period may indeed hide the role played by low capital investment. We believe that a large increase in the cost of capital during this period caused the observed fall in investment and contributed to this reallocation. If such labor reallocation –as suggested by the data- involved a change in average labor intensity, the standard Solow-decomposition understates the role played by the low capital accumulation during this period.

What caused the large increase in the cost of capital during this period? As shown by our analysis, it can be explained to a large extent by an increase in tariffs and non-tariff barriers and high interest rates that followed the default in the early 80's. But even if one believes international lending came to an end during this period, high local interest rates are still to be explained. One possible explanation could come from expectations of bank runs or the confiscation of deposits, which occurred twice during the 1980's. An alternative cause which we explore in the paper, is lead by expectations of future capital losses. In the model presented, such capital losses are associated to a reversal in trade protection policy and the resulting fall in the relative price of imports.

Our simulations suggest that if investment is irreversible (putty-clay), small changes in expectations can give rise to a large increase in capital costs. This could lead to a collapse in investment or at least a significant fall in capital/labor ratios and a large reallocation to more labor intensive sectors, as observed in the data. Moreover, our model predicts a substantial fall in wages which partly compensates the rise in capital costs, which is necessary to encourage investment. During the 80's, real wages did not fall as predicted by the model but investment collapsed. At the same time, government employment increased. If such employment creation served to contain the fall in wages, then it may be partly responsible for the investment collapse.

The model we have considered is overly simplistic and obviously misses many important ingredients. But it provides a plausible alternative story to Kydland and Zarazaga's (2002) one sector neoclassical growth model. Further work is needed to evaluate the quantitative merit of this story.

6. Appendix A. Estimates of human capital growth

The following procedure was used to construct the human capital series. Letting X_{it} denote a vector of characteristics of worker i at time t , let $H_{it} = \beta X_{it}$ where β is a vector of weights estimated according to the procedure indicated below. H_{it} is a measure of the human capital of worker i . The population H_t is obtained by computing an average of the sample values H_{it} .

Data. All estimates were obtained using the household survey for the Federal District and Greater Buenos Aires area. The survey is currently held twice a year (may and October.) Only the October surveys were available for the years 1980-86. For the remaining years both

surveys were used. An incomplete survey with no wage information was also available for 1974.

Estimates. The coefficients β were estimated through a wage regression, pooling all surveys available from 1980 onwards. Sample selection was controlled by jointly estimating a participation equation, as in Heckman (1979). Consistent standard errors were obtained using the method in Greene (1981),

The following covariates were used in both, participation and wage equations: age, dummies for sex and 5 schooling levels esc1-esc5 (completed elementary , incomplete high school, completed high school, incomplete college, complete college) and dummies for each of the surveys.

Estimates for the human capital parameters in the ln wage equation are given below:

Estimates of Human Capital Parameters					
Variable	DF	Estimate	Standard Error	t Value	Pr> t
Intercept	1	4.51186	0.16029	28.15	<.0001
Age	1	0.01093	0.00021509	50.81	<.0001
Sex (male =1)	1	0.68367	0.0341	20.05	<.0001
Esc1	1	0.62498	0.05908	10.58	<.0001
Esc2	1	0.74869	0.05288	14.16	<.0001
Esc3	1	1.19538	0.07474	15.99	<.0001
Esc4	1	1.29406	0.07494	17.27	<.0001
Esc5	1	1.85703	0.09293	19.98	<.0001

7. Appendix B. Policy chronology

1952-1955 Peron's Second Presidency

During his second presidency, Peron makes an important change in economic policy in response to changes in the economic context (high inflation, balance of payments large deficit, bad quality harvest). First, he implements a short run stabilization plan, with notoriously different characteristics to his previous more social policies. Second, he presents a long run structural plan, which emphasizes the need of foreign direct investment in order to continue industrial development.

The Economic Plan

Short run stabilization plan. Its main objective: Stop inflation and solve the external trade balance deficit.

- Fiscal Policy: Public spending reduction (23% in the 1950-1952 period in constant prices)
- Price and Salary controls: Salaries to be negotiated every two years.
- Monetary Policy: large reduction in the money growth rate.
- Trade Policy: Export subsidies to agricultural products, imports reduction.
- Incentives to the agricultural sector: credits and export subsidies. This meant a policy change at the IAPI, which used to buy agricultural products at low prices and then sell them at high prices to the other countries.
- Research to increase productivity and reduce costs in the agricultural sector

"Second Five - Year Plan" (1953)

- Industrial policy: Import Protection and public credits to the industry (Credits were 2.8% of GDP in 1946 and 6.7% of GDP in 1955).
- Foreign Direct Investment: In contrast to his previous policies, Peron decides to attract foreign capital to develop the energy industry among others in order to solve balance of payments problems (imports reduction) and increase agricultural productivity (increase in exports).
- Exchange rates are used to favor industrial exports. There are two managed exchange rates administered by the Central Bank used for exports and a third rate (called "libre" or "financiero") administered by the Banco Nación. This third rate is used for imports and financial transactions.

1955 - 1958 "Revolución Libertadora"

1955 Lonardi y 1955 - 1958 Aramburu

During Lonardi's presidency, Mr Prebisch was hired to make a report describing the economic situation. This report highlighted the two main problems of the Argentine economy: Inflation and balance of payments deficit. In Prebisch's opinion, the main obstacle of Argentina's development, was that it could not increase imports neither of input and oil nor equipment and machinery. This was due to the limited agricultural exports.

This report suggested some potential courses of action such as a devaluation, a change of domestic relative prices in favour of agricultural goods, an import priority to equipment and machinery, and to generate incentives for foreign direct investment. Following this report, Prebisch wrote a second one. It recommended reducing inflation by means of an orthodox policy: reduction in money growth rate and diminishing fiscal deficit.

The measures finally implemented were:

- Devaluation
- Unification of exchange rates but the BCRA establishes a series of taxes to foreign exchange sales.
- Access to exchange markets is free through authorized institutions to facilitate the import process of some goods difficult to acquire in the official market.
- Implementation of quantitative import restrictions.
- Increase in monetary emission
- External deficit financed by reserves loss and short run debt.
- Minister Krieger Vasena froze salaries' growth as part of a stabilisation program (September 1957 - March 1958).

1958 -1962 Frondizi

The import substitution process contributed to the development of the so-called light industries. However, some inputs and machinery to supply these industries still needed to be imported. This is why Frondizi's main objective was to develop the "basic industries" in order to vertically integrate the entire industrial sector and to reduce the need for imports. Similarly, he wanted to develop the oil industry so as to end Argentina's dependency on this product's imports.

Development policy

- Foreign Direct Investment to finance the industrial development: cars, oil, etc. (FDI 30% of exports in 1960).

- The agricultural sector would progress as long as the industrial sector does so.

In 1958, salaries were increased by 60% and there was large monetary emission. Exchange controls were employed.

- Agreement with the IMF. Its main objectives were: trade liberalisation (no more need for import permits), devaluation, fiscal adjustment and Foreign Direct Investment.

Stabilisation Plan 29 December 1958

- Unification of exchange rate. Dirty floating.
- Taxes on exports between (10% and 20%)
- Abolition of quantitative restrictions and imports permits.
- Previous deposits for importing goods.
- Import tariffs that varied from 0% for "essential" inputs to 300% to "luxury" goods and domestically produced goods.
- A maximum of 2% was established for the money growth rate not backed by foreign currency.
- Fiscal deficit reduction
- Increase in taxes and stronger fiscal controls.

This plan did not succeed and it caused a change of the Minister of Economics.

Minister of Economy: Alsogaray

- Exchange rate fixed at 83 pesos per dollar in August 1959 (The maximum rate was 100 pesos per dollar in May)

- Implements the increase in bank's legal reserves
- Fiscal deficit reduction
- Foreign Direct Investment
- Abolition of previous deposits and import tariffs to certain types of machinery and equipment.
- Industrial policies: investment in the oil, petrochemical and steel sectors. (State owned)

Minister of Economy: Aleman

He continued the lines of Alsogaray's plan. He resigned when the government decided resorted to monetary emission to settle some debts. Mr Coll Benegas replaced Mr. Aleman and stated taking some measures to reduce the external deficit. He also insisted with fiscal deficit reduction.

1962 - 1963 Guido

- Liberalisation of the exchange rate
- Stop fiscal deficit and monetary emission
- Tax increases
- Payments to government suppliers were called off.
- Delays in salary payments to government employees.
- When the measures described above were no longer enough, the government started paying its suppliers and employees with bond.

1963-1966 Illia

The Government's priority was to reactivate the economy, and other objectives such as prices stability and fiscal equilibrium were subordinated to it. The government policies included:

- Increase in government spending (25% in real terms)
- Credits financed with monetary emission (40%). These credits were granted to labor-intensive industries.
- Prices policies: public utility tariff were frozen, minimum wage law, wages increased 10% during 1964.
- After the money emission in 1964, the government tried to stop inflation by reducing its growth rate from 40% to 27%.
- Government debt with foreign countries was restructured in 1965.
- Some imports financing was suspended.
- Exchange controls for financial transactions were reestablished.
- More credits were granted to those industries diminishing their amount of imports.
- Foreign intermediate goods were restricted in the car industry.
- Crawling Peg
- Oil contract with foreign companies were cancelled

1966 - 1973 "Revolución Argentina"

Onganía June 1966 - June 1970

- Traditional exports subject to export taxes
- "Draw - back" system to non-traditional exports.

- Taxes deductions and soft credit to non - traditional exports.
- In 1967, devaluation, a tariff reduction and an increase in export taxes took place.

March 13 1967 "Development and Stabilization Plan" (Krieger Vasena)

- Fixed the exchange rate to 350 pesos per dollar (this implied a devaluation of 40%)
- Reduction in imports tariff
- Taxes to traditional exports (between 16% and 25%)
- Salaries negotiations were suspended and salaries were augmented %.
- Money growth rates: 30% in 1967 and 27% in 1968.
- Public Utilities tariff were increased
- Sales taxes were increased, other new taxes introduced.
- Export taxes

Minister of Economics: Dagnino Pastore

- Measures to reduce imports
- Salaries increased by 20%

Levingston June 1970- March 1971

Minister of Economics: Moyano Llerena

- Devaluation (dollar from 350 to 400)
- Export taxes
- Import Tariffs reduction

- Industrial policies: oriented to domestic investment, however foreign investment was not cancelled.

Minister of Economics: Aldo Ferrer

- "Compre Nacional" policy: the government and its enterprises ought to buy national goods and services.
- Credit policy was oriented to national companies.
- Government spending augmented
- Currency change: Peso Moneda Nacional was replaced by Peso Ley 18.188 (1 peso ley = 100 peso moneda nacional)
- Exchange control reestablished.

Lanusse March 1971 - May 1973

- Multiple (five) exchange rates.
- There were two exchange rates for exporters; exporters of "non-traditional" goods were favored by a better exchange rate. Also, "non-traditional" good exporters benefited from selling part of their foreign currency in the financial market, where the exchange rate was higher than the one at the commercial market.

1973-1976 Peronist Administration

Campora (May 1973 -July 1973)

Lastiri (July 1973 - Octobrer 1973)

Peron (October 1973 - July 1974)

Martinez de Peron (July 1974 - March 1976)

Minister of Economics: Ber Gelbard

- May 1973: "Pacto Social": stabilization plan and reform program.
- 1973: Law which restricted foreign direct investment, however, it was not strictly applied.
- Trade policy: contrary to Peron's first and second presidency policies, during his third administration he favored industrial products' exports. Part of this policy was the "National production and labor protection law"
- Credits to small and medium companies exporting manufactured goods.
- International trade Nationalization. The government was now in charge of exports (through the IAPI) as it used to do it during Peron's first presidencies.
- Various trade agreements with socialist countries were signed. Between 1972 and 1976, the share of exports to these countries increased from 3% to 11%.
- Monopoly of the Financial System. Banks acquired deposits on behalf of the Central Bank and they granted credits according to the amounts allowed by the Central Bank.
- A Price and Salaries configuration was agreed, expecting that they would last. Salaries were augmented (e.g 20% to low income workers) and then froze as well as prices. Salaries' negotiations were suspended for two years to prevent more increases in salaries that would trigger a price increase.
- Money emission continued
- Import subsidies to foreign inputs.

March 1974

- Increases in Salaries, public utilities tariff, oil prices and other goods' prices.

Minister of Economics: Gómez Morales (September 1974)

- Prices and salaries adjustments
- Fiscal deficit reduction
- Foreign Investment Incentives
- Moderated Devaluation

Minister of Economics: Rodrigo

- 100% devaluation
- Almost 100% increase in public utilities tariffs.
- Almost all Prices liberalization

mid -1975 Bonanni, Cafiero, Mondelli

- 1976 FMI credit

1976 - 1983 "Proceso de Reorganización Nacional"

Videla March 1976 - March 1981

Minister of Economics. Martinez de Hoz

- Gradual anti-inflation policy: complete Price liberation, exchange rate adjusted to inflation.
- Salaries froze and then augmented following price increases.

- FMI credit helped to pay urgent debts.
- Financial Reform (1977): liberalization of interest rates and decentralization of credits and deposits, each bank's credit granting policies would be directly related to their ability to attract deposits. Regulated legal reserves. There was no credit quality control and deposits were backed by the Central Bank. This configuration did not give the correct incentives to a correct credit policy.
- 1977 import tariff reduction in connection to the anti-inflation policy.
- After the financial reform, the money growth rate was 2.6% per month.
- Crawling peg
- In May 1978, the government decided to give up the exchange policy and to concentrate in the monetary policy (establishing the amount of money for the economy).
- In December 1978, as the money emission control did not succeed in reducing inflation, the government decided to control the exchange rate.
- 20 December 1978, the "tablita" was established. It described the exchange rate sequence. Public utility tariff, minimum salaries and the domestic credits had their own expected sequence. All these measures were taken in order to reduce inflation, taking it to a level compatible to the inflation level implicit in the price sequences of the tablita. The exchange market was deregulated.
- July 1980, deepening of the stabilization plan that included fiscal deficit reduction and foreign credit restriction were cancelled among other measures.
- In February 1981, 10% devaluation took place ending with the tablita.
- Trade policy: traditional exports taxes were reduced. Towards the end of 1978, all export taxes were cancelled (they would reappear under the following administration)

- Policies concerning non-traditional products' exports were considered in a case by case bases (using credits and fiscal incentives).
- Gradual reduction in import tariffs, the schedule was as follows: November 1976, maximum tariff was reduced to 100%, December 1979, reductions in accordance with the tablita and July 1980, this procedure was accelerated.
- Import tariffs reduction to those products whose price augmented more with the amount compatible with the tablita.
- To give more incentives to investment, capital import tariffs were reduced.

Viola (March - December 1981)

Minister of Economics: Sigaut

- Abolition of the tablita
- Several devaluations
- Exchange market divided in financial and commercial dollar.
- Import tariff increase
- The government started acquiring Private debt.
- In November, an interest rate control system was established.

Galtieri (December 1981 - June 1982)

Minister of Economics: Alemann

- Liberation of the exchange rate
- Public utilities tariffs and public salaries froze

- Interest rate control system was abolished.
- Export taxes were reintroduced
- Import tariffs structure was modified.
- Money emission was considerably reduced (zero during four months).
- Privatization of some secondary activities of public companies.

Bignone (July 1982 - December 1983)

Minister of Economics: Pastore (July - August 1982) (Cavallo at the Central Bank)

- Interest rates applied to debtors would grow at a regulated rate (below expected inflation)
- Banks were compensated with credits granted by the Central Bank at negative real interest rates.

Minister of Economics: Wehbe (August 1982 - December 1983)

- Private foreign debt socialization.
- In 1983, external debt amounted to 45 billion dollars (70% was public debt compared to 50% in 1981).

1983-1989 Alfonsín

Minister of Economics: Grinspun

- To fight rising inflation, the exchange rate and public utilities tariffs were directed by the government

- Wages were fully indexed to price increases
- Large fiscal deficits financed with money creation.
- Foreign debt
- Trade distortions

Minister of Economics: Sourrouille

- previous to the implementation of a new stabilization plan, the government devalued and increased public service tariffs

New stabilization plan "Plan Austral"

- new currency: austral
- freezing of all prices
- the Central Bank would stop printing money to finance the government
- tax increases (combustibles)
- export taxes
- "ahorro forzoso": Compulsory saving scheme for the private sector. It worked as a tax.
- All contracts utilizing the old currency, which were based on a high expected inflation, were transformed to australes through a table called "desagio" to prevent from redistribution between creditors and debtors.
- April 1986 "Flexibilization" tariffs and exchange rate started to be adjusted periodically.
Prices unfrozen.

- Prices are frozen twice during 1987 (february and october) to fight rising inflation. The government starts a program of giving soft credit (viviendas) and transfers to provinces before the 1987 election increasing the fiscal deficit (at 7.3% GDP).

August 1988 "Plan Primavera"

- desindexatory agreement with leading industrial firms (UIA, CAC). IVA for these firms was reduced.
- new exchange rate regime. The exchange rate dynamic was pre-announced and the BCRA committed to maintain a fixed relation between the official and the financial rate. The Central Bank would help to finance the government by buying cheap foreign currency from exporters at the regulated official rate and selling it in the financial market to make a profit.
- Internal debt was forcefully refinanced with local banks.
- There was a run on the Austral and on February 6, 1989 the exchange rate system was modified creating an additional "free" rate. The Austral depreciated 193% in April and 111% in May. The monthly inflation rate rose from 9.6% in February to 78.4% in May. Trying to fight hyperinflation the exchange rate mechanism suffered 6 further modifications between February and June (when the Menem administration took office).

1989-1999 Menem Presidency

Minister of Economics: Antonio Erman Gonzalez 1989-1991

- During this period inflation is high and the government is unable to finance its current expenditure.
- "Plan Bonex": The government freezes time deposits and forcefully exchanges them into low interest dollar denominated bonds called "Bonex" bonds.

Minister of Economics: Domingo Cavallo 1991-1996

March 1991 "Ley de Convertibilidad"

A law is passed in which

- a currency board is established fixing the exchange rate at 10.000 australes per US dollar. Monetary emission must be backed by the central bank reserves in gold and foreign currency.
- Indexation clauses in private and public contracts are forbidden to stop inertial inflation
- Access to the exchange market is free

Liberalization

- Several public enterprises are privatized. This includes the electricity generation and transportation, petrochemical and steel industries. The national oil producer YPF is sold and public utilities such as natural gas provision, water and sewage, telephone services, mail and railroads are privately run.
- The main tax rate (IVA) is increased and tariffs on international trade are lowered.
- Tariffs on agricultural exports are eliminated.
- The MERCOSUR common market treaty is signed with Brazil, Uruguay and Paraguay.

- A bilateral treaty is signed with Brazil to favor the automobile industry
- Private pension funds (AFJP) are created.

Minister of Economics: Roque Fernandez 1996-1999

- IVA tax rate is increased for some sectors.
- A new tax on interest payments is created. Corporations are taxed with "Minimal assumed profit tax" (Ganancia mínima presunta).

TABLE I: LABOR ALLOCATIONS AND OUTPUT PER WORKER: ARGENTINA 1950-1997

	Agriculture		Mining		Manufacturing		Electricity, Gas, Water		Construction	
	Share of Labor	Output per worker	Share of Labor	Output per worker	Share of Labor	Output per worker	Share of Labor	Output per worker	Share of Labor	Output per worker
1950	19%	93	1%	97	28%	100	1%	93	6%	77
1960	17%	115	1%	190	27%	140	1%	124	7%	70
1970	17%	112	1%	347	25%	213	1%	305	10%	79
1970	17%	119	1%	443	25%	169	1%	308	10%	95
1980	12%	137	1%	537	20%	163	1%	455	11%	91
1980	12%	74	1%	490	20%	181	1%	189	11%	98
1987	11%	82	0%	543	18%	179	1%	220	7%	115
1993	6%	137	0%	980	17%	183	1%	344	7%	93
1993	6%	95	0%	585	17%	130	1%	323	7%	92
1997	7%	89	0%	807	15%	153	1%	476	8%	96

	Wholesale and Retail Trade, Restaurants, and Hotels		Transport, Storage and Communications		Banking, Insurance and Real Estate		Community, Social and Personal Services		Output per worker
	Share of Labor	Output per worker	Share of Labor	Output per worker	Share of Labor	Output per worker	Share of Labor	Output per worker	
1950	10%	186	8%	110	1%	289	25%	63	100
1960	12%	192	8%	113	2%	263	25%	74	121
1970	11%	247	8%	142	2%	241	24%	85	154
1970	11%	209	8%	216	2%	520	24%	91	154
1980	17%	104	5%	267	4%	253	29%	65	129
1980	17%	133	5%	99	4%	405	29%	77	129
1987	20%	97	5%	108	5%	353	32%	70	120
1993	22%	87	6%	104	7%	262	33%	64	119
1993	22%	88	6%	141	7%	320	33%	69	119
1997	24%	93	6%	170	7%	372	33%	72	131

Note: NIPA accounts at prices of 1960, 1970, 1986, and 1993.
 There is no labor data by sectors for the periods 1974-1979 and 1988-1992.
 The sum of value added per sector at 1993 prices is 94% of GDP.

Figure 1: Argentina Income

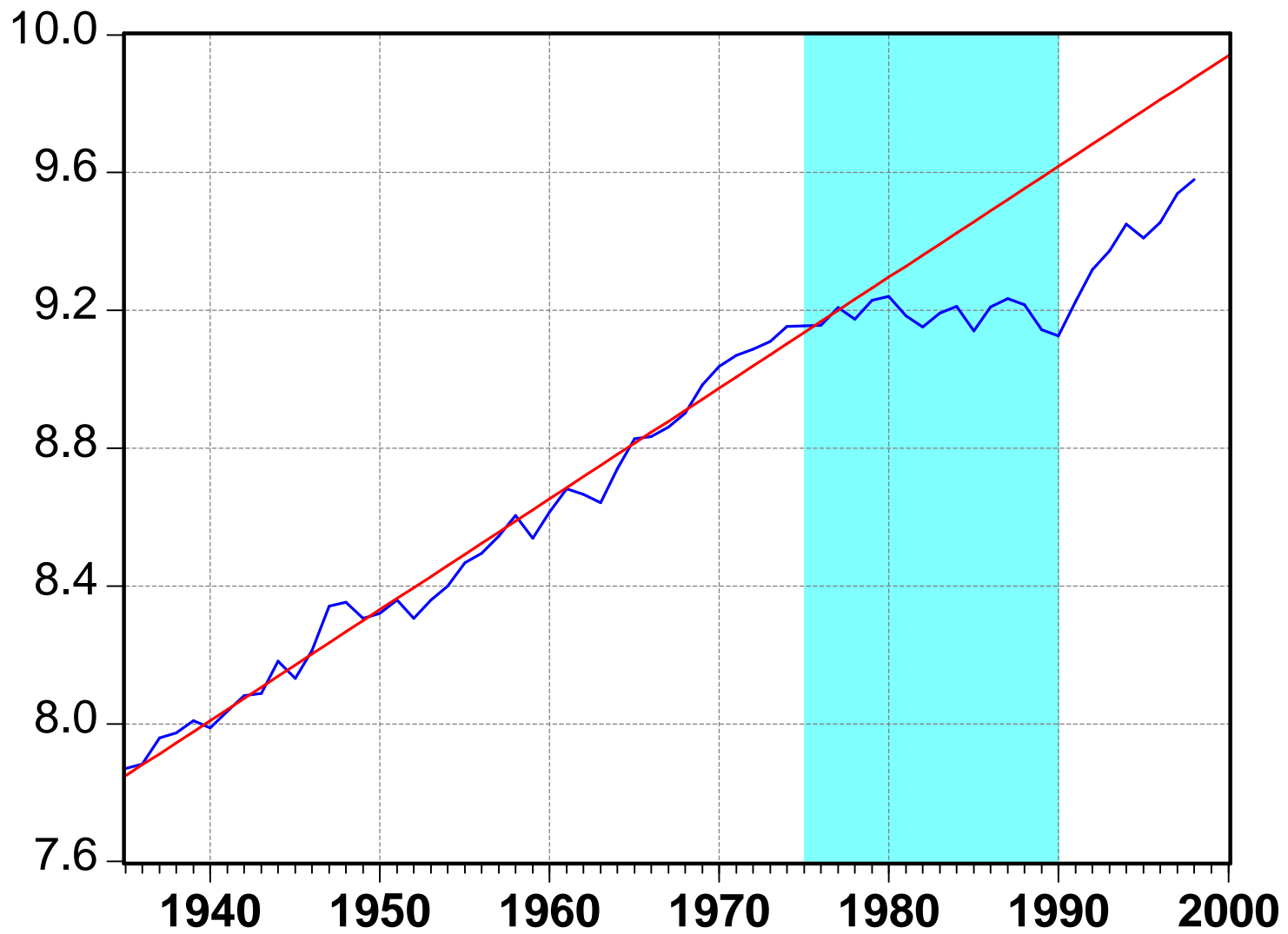


Figure 2: Argentine Income Per Capita

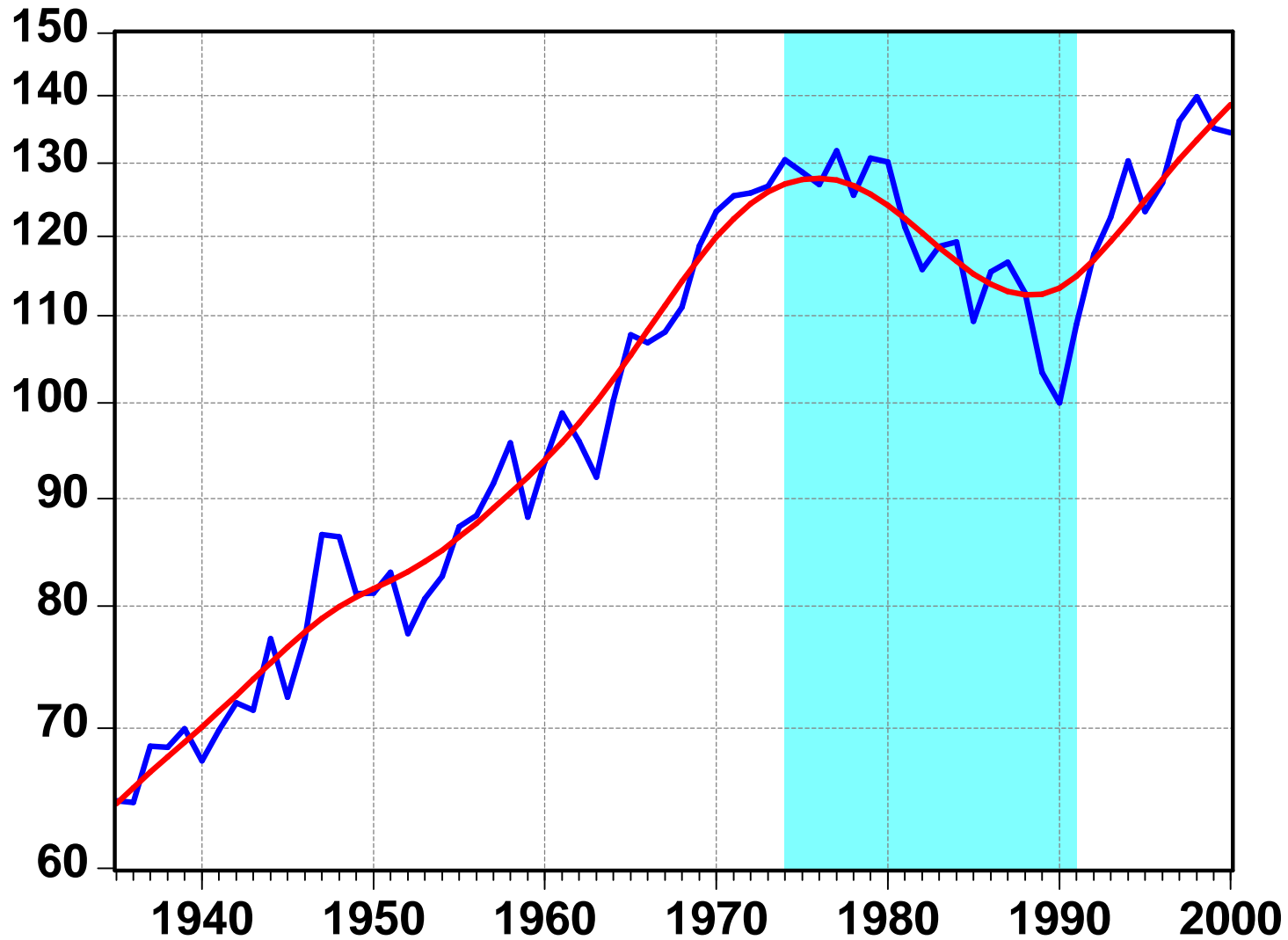


Figure 3: Argentine Relative per Capita Income

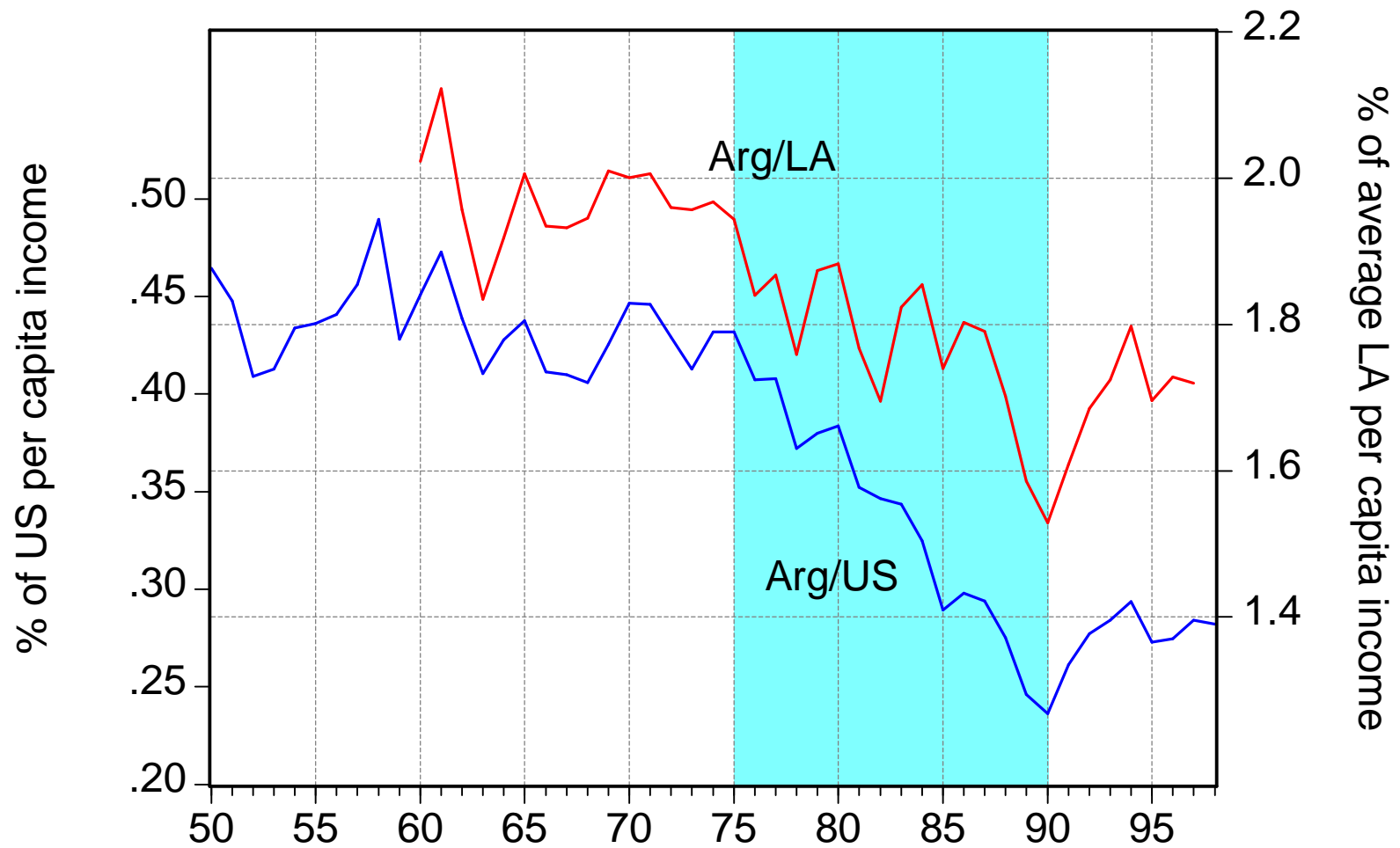


Figure 4: Employment

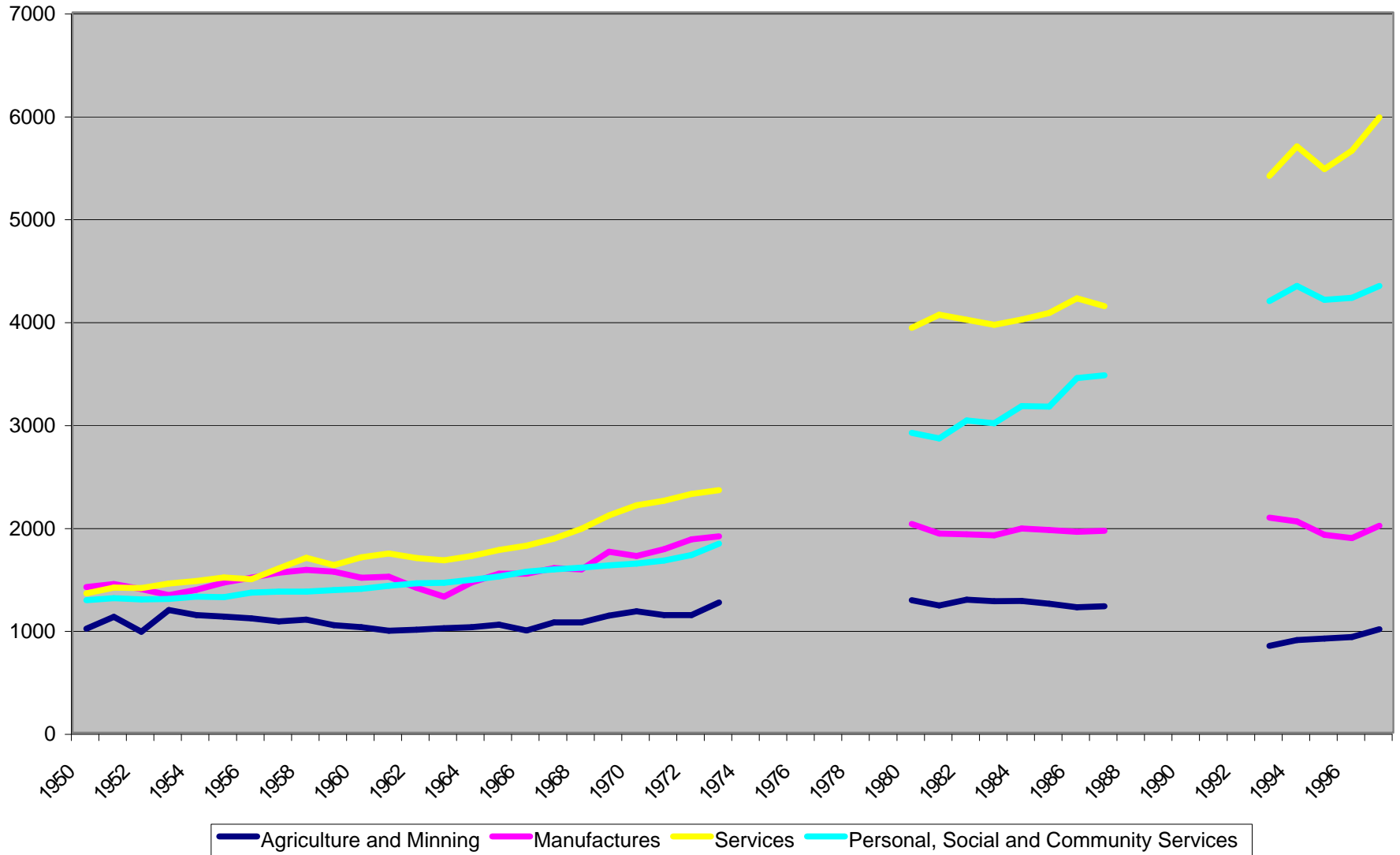
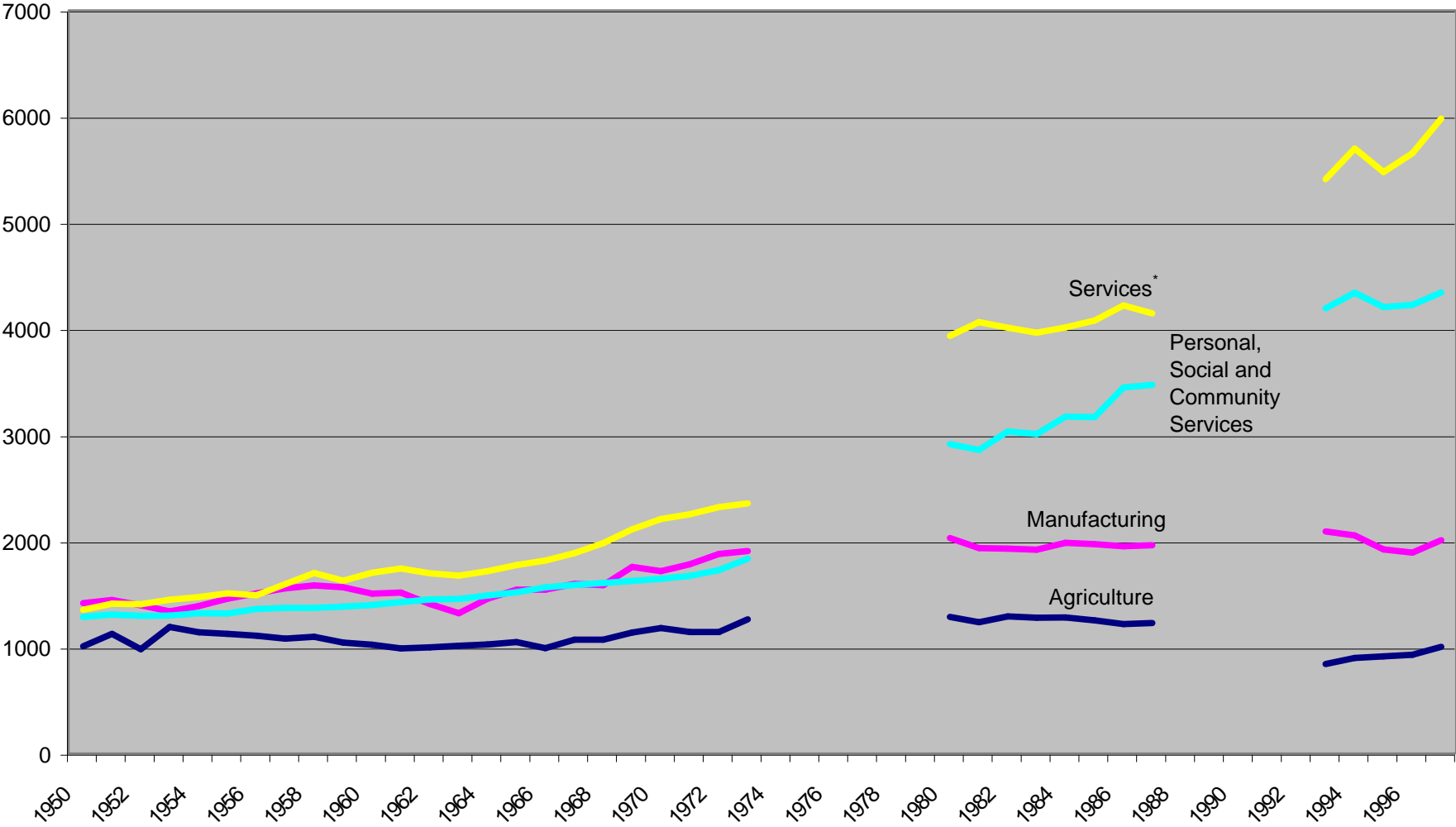


Figure 4: Employment by Sector



* Services includes: Electricity, Gas and Water; Construction; Wholesale and Retail Trade, Restaurants and Hotels; Transport, Storage and Communications; Banking, Insurance and Real Estate.

Figure 5: Implicit Export Taxes and Import Tariffs

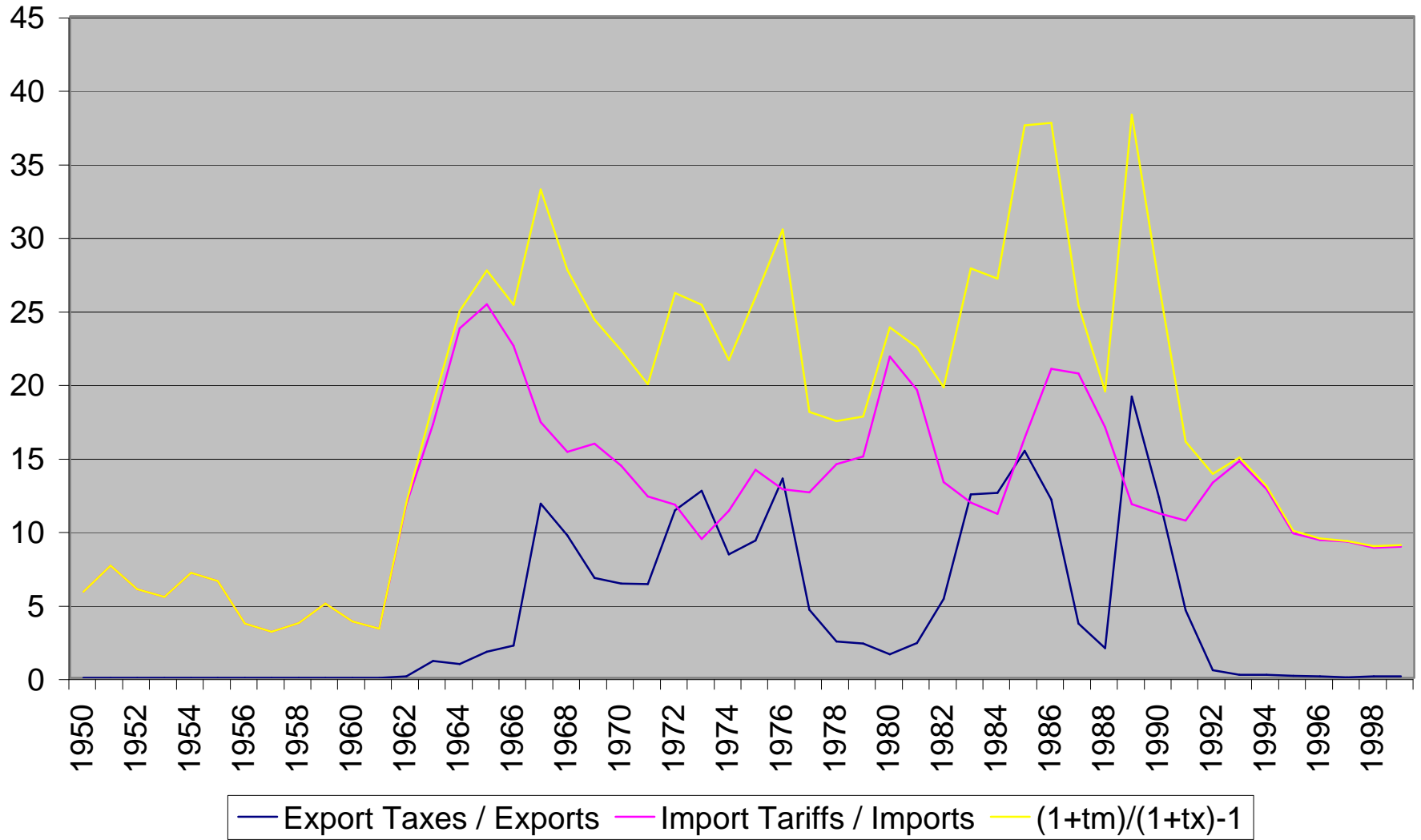
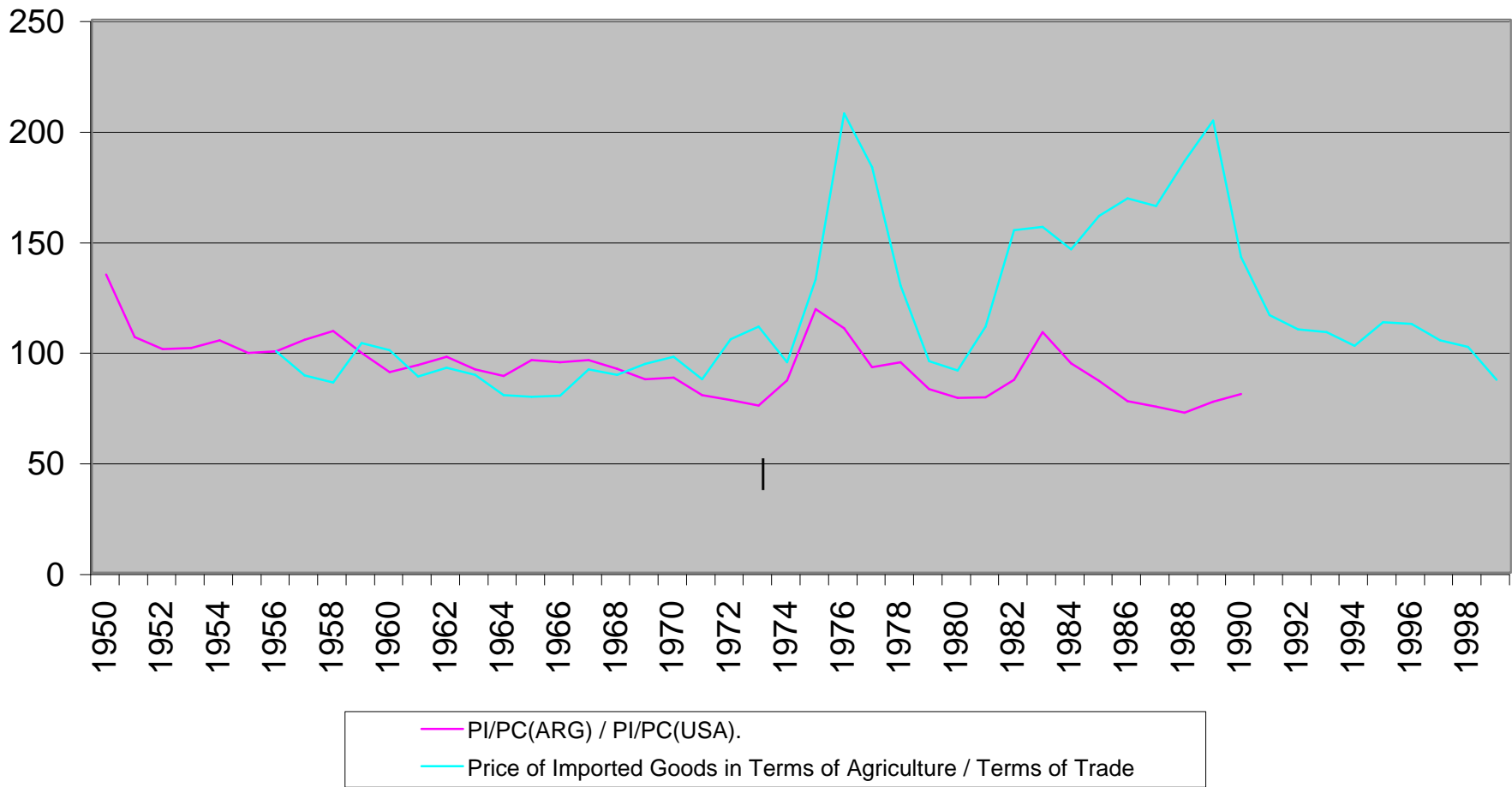


Figure 6: Trade Policy and Relative Prices



Sources and Comments: The relative price of investment goods is from the Penn World Tables. An index value of 100 corresponds to a true value of 2. Domestic relative prices are from the wholesale price index and the terms of trade from Berlinski (2000)

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