Essays on Argentina's growth cycle and the world economy

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Chapter 4: Exchange Rates and Growth Cycle in Argentina, 1953-2004♠

This chapter discusses Argentina's wide macroeconomic fluctuations around a trend that declined relatively to the rest of the world. The argument is based on the stylised facts during the 1953-2004 period.

The main argument is the following: Argentina's land abundance and fertility generates two remarkably different equilibrium exchange rates, one appropriate for agriculture and one for industry. This duality produces high uncertainty that both depresses the exchange rate elasticity of supply of exports and also causes output to diverge from equilibrium through the multiplier-accelerator. This output disequilibrium is amplified in the trade account by the high income elasticity of demand for imports that undersupplies and oversupplies dollars in expansions and recessions respectively. The start and the end of the currency depreciation set the floor and the ceiling to the output cycle. Thus, such elasticities both destabilise the trade account near the equilibrium and limit output divergences far from equilibrium. The cyclical depreciation along with wage goods exports, generate conflict over income distribution and strain institutions decelerating the growth trend below its equilibrium path. The government can postpone recessions with fiscal deficits and foreign debt but this further depresses the trend. The balance of payments determined equilibrium growth path improves with time because demand for manufactured exports grows much faster than that for food exports.

An equilibrium attracts resources when most individuals perceive its convenience and dispose of their resources accordingly (Pareto 1906). An example would be the comparative advantage equilibrium with its corresponding purchasing power parity (PPP) exchange rate[38]. In the *dynamic comparative advantage* literature (Redding 1999) the economy has an existing low growth equilibrium associated with its comparative advantage sector (say agriculture) and also a high growth equilibrium that would be

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♠ An abbreviated version of this chapter is currently under consideration for publication in the *European Economic Review,* Elsevier Science.

[38] Rogoff (1996) and Taylor (2002) present evidence of the convergence of the market exchange rate to its PPP average value in a group of countries excluding Argentina.

unleashed if temporary tariff protection allowed the 'infant industry' with increasing returns to wake up and grow strong to face competition in the future (Prebisch 1950, Kaldor 1964 and Grossman & Helpman 1991). In our argument for Argentina, with fast growing external demand for manufactures the industrial equilibrium needs no tariff protection to pull the economy out of its comparatively advantageous agricultural position where unemployment is high and capital goods' prices are low.[39] Higher growth and the large income elasticity of demand for imports rise the exchange rate towards its industrial PPP value that provides landowners with liquidity that is disposed of with agricultural equilibrium preferences, which attracts the economy back towards its comparative advantage position, and so on in continuous instability.[40] In short, we consider Argentina's equilibrium in 1953-2004[41] as a function of its two different PPP exchange rates that relate, in turn, to two different sets of labour demands, relative prices, wages, rent income and external demands. In spite of Argentina's strong comparative advantage in agriculture, the evidence suggests that the industrial equilibrium tends to prevail through time although the cycle disturbs this process. Exchange rate stabilisation facilitates growth.

Compared to an aggregate general equilibrium benchmark in which the world economy tends to a single relative price structure and a uniform per-capita income, our dual equilibrium would be a permanent disequilibrium caused by lack of worldwide capital and labour mobility. Accounting for the numerous deviations from such a general equilibrium benchmark would yield loss of clarity. In its limited time and space our dual equilibrium lacks generality and differs from the "*multiple equilibria*" literature (Olivera 1967) where, for example, demand conditions such as differences in tastes between owners of production factors (Johnson 1959), or incomplete markets (Diamond 1982), or imperfect competition and lack of information (Heller 1986) lead agents to a Pareto sub-optimal equilibrium.[42]

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[39] The "dynamic comparative advantage" would provide an explanation of Argentina's industrial development during the trade disruptions in the first half of the twentieth century at times of world wars and economic slumps in Europe. By the nineteen fifties however, this had already happened.

[40] In the conventional dual-economy of development economics resources are attracted by the modern sector in one direction only.

[41] The idea of historically dated equilibrium we borrow from econometrics. For example, in Engle and Granger (1987) a relationship among similarly trending variables would be an equilibrium relationship. Also the nineteen-thirties' growth cycle literature modelled dynamic equilibria based on 'facts of economic life' (Tinbergen 1935).

[42] Multiple equilibria with two sectors, imperfect competition and increasing returns in manufacturing leading to economic fluctuations but without a cyclical pattern are discussed in Durlauf (1991). In general, multiple equilibrium was considered by Walras (1926) if producers

Based on the pre Second World War history of instability, traditional growth cycle models (i.e. Kalecki, Tinbergen, Roos and Hicks) emphasized agents' uncertainty about the future trend of prices and output, and assumed self-fulfilling expectations. Thus, endogenous fluctuations were modelled with some form of the multiplier-accelerator (Goodwin 1950, Hicks 1950, Tinbergen 1950 and Smithies 1957). Such models ceased to be used[43] as the industrialised economies entered an era of remarkable growth and unprecedented stability in which agents are able to anticipate the trend with a lower error margin[44]. Consequently, the aggregate general equilibrium tradition (i.e. Solow 1956, Kydland & Prescott 1982, Long & Plosser 1983 and Prescott 1986) assumes perfect foresight and fluctuations responding to exogenous shocks (i.e. technology) around a full employment trend in which scarce capital and labour are optimally demanded as a function of their aggregate marginal productivities. For Argentina we adopt a different approach: with labour over-abundance, production coefficients determined abroad and critical capital goods and technology also imported, foreign exchange becomes growth's limiting 'factor' (Braun & Joy 1968)[45] as in other development economics models (i.e. Chenery & Bruno 1962 and McKinnon 1964). Moreover, because dual equilibrium produces high uncertainty we keep the old multiplier-accelerator in the tool-kit.

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use their own highly priced output as an input. In Lewis (1954) and Braun (1973) multiple labour supply equilibrium occurs at very low wage rates.

[43] Empirically, most of the traditional macro-econometric models of the structural form type could not account for the increasingly complex interrelations of industrialised market economies (Sims 1980) and were gradually replaced in the nineteen seventies and eighties by time series autoregressive models. Interestingly, time series models distinguishing trend, cycle and fluctuations were already developed in the thirties (i.e. Frisch 1933 and 1936) and in its antagonism to Keynesian Macroeconomics the 'New Classical' business cycle literature claims that early cycle literature as its ancestry (Weintraub 1991).

[44] In relation to his 1935 article Jan Tinbergen said "I think that what interested economists most [before II World War] was not the shocks but the mechanism generating endogenous cycles, and it might well be that we have overestimated the role of the mechanism. Maybe the shocks were really much more important. This problem has never been solved, because the War came along and after the War we were not interested in business cycles anymore" (Tinbergen 1987, p. 125)

[45] The embryo of the structuralist balance of payments argument that Argentina's growth is constrained by its dual socio-economic structure as reflected in the price and income elasticities of foreign trade is in Olivera (1924) and it is developed by Ferrer (1963), Diaz Alejandro (1963), Eshang & Thorp (1965), Braun & Joy (1968) and Diamand (1972).

Some semi-industrialised natural-resource abundant economies with high institutional quality[46] (i.e. Australia[47]) joined the industrialised economies' prosperity. With poor institutional quality and specialization in wage good exports, Argentina stands out with a poor and widely fluctuating[48] growth performance in 1953-2004 (see **Figures 4.1 and 4.2**). From 1880 up to 1930, however, with a low level of industrialisation and limited literacy, food-exporting Argentina experienced fast growth relatively to the rest of the world (see **Table 4.1**) and had one of the highest per capita incomes in the world absorbing massive immigration. Around the 1930's Argentina was industrialising and social and political tension gradually increased. By 1953 it was semi-industrialised – i.e. it had a high literacy ratio and a well established manufacturing sector but lacked a domestic capital goods and technology sector – and a remarkable correlation between the exchange rate and economic growth appeared. **Figure 4.3** shows that in 1953-2004, Argentina's six largest recessions coincided with six large currency depreciations[49].

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[46] Institutional quality includes rule of law, government effectiveness and political stability as measured in Harvard's and World Bank's indices www.cid.harvard.edu/ciddata/ciddata.html and www.worldbank.org/wbi/governance/govdata

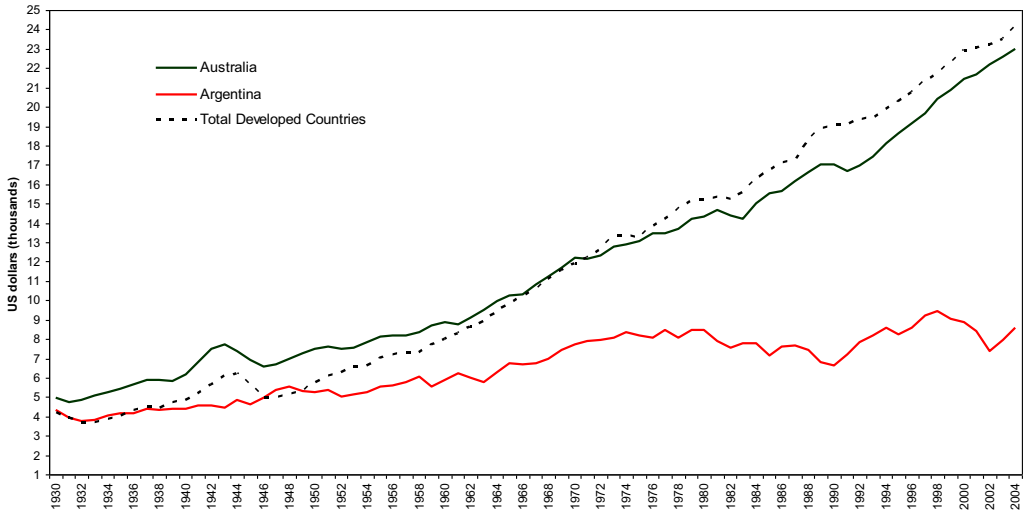
[47] Traditionally, Australia exported minerals and food but only the latter produce severe domestic re-distributive and recessive effects with currency devaluation when the industrial sector is relatively important. In 1950-2005 the annual cumulative growth rate of world demand (exports) was 6,4% for agricultural products, 10,1% for minerals and fuels and 11.1% for manufacturing (www.wto.org). Following this trend Australia moved away from food exports. By 1974 Australia's food (including manufactured food) to total exports ratio was 30% and in 2006 it had declined to 12% (www.abs.gov.au). In Argentina it was 75% and 52% in those same years (www.indec.gov.ar)..

[48] According to Aguiar and Gopinath (2007), within a group of 13 Emerging Market Economies in the period 1980-2003, Argentina and Perú had the largest output volatility measured as the first and second moments' percentage standard deviation from trend, σ_y and $\sigma_{\Delta Y}$ respectively. In Argentina σ_y=3.68 and $\sigma_{\Delta y}$=2.28; in the developing group σ_y=2.74 and $\sigma_{\Delta y}$ =1.87. For a 13 Small Developed Economies group σ_y=1.34 and $\sigma_{\Delta y}$ =.95 and Australia σ_y=1.39 and $\sigma_{\Delta y}$=.84. Argentina's volatility of consumption relative to output is also high σ_C/σ_Y=1.38 compared with .94 in the developing group. The particular case of Argentina is not discussed. Countries' classification follow Standard and Poor's (2000): an Emerging Market Economy is that with a) a low stock market capitalisation (as a ratio to GDP) that is accessible to foreign investors, and b) a low or middle per capita income level as defined by the World Bank. Emerging economies are Argentina, Brazil, Ecuador, Israel, Korea, Malaysia, Mexico, Peru, Philippines, Slovak Republic, South Africa, Thailand and Turkey; Small-Developed are Australia, Austria, Belgium, Canada, Denmark, Finland, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden and Switzerland.

[49] Argentina's contractionary devaluations inspired Olivera (1962), Diaz Alejandro (1963), Ferrer (1963), Eshag & Thorp (1965) and Braun & Joy (1968) to develop their structuralist balance of payments constrained growth models. With inelastic exports and different consumption propensities from profits and wages in their short-run model Krugman & Taylor (1978) discuss contractionary devaluations in semi-industrialised countries. With different adjustment lags in wages and exports Larrain & Sachs (1986) generate theoretical cycles around a steady state trend in an abstract developing country.

In the 'Dutch Disease' argument an *exogenous* rise in the natural resource sector's exports produces a rise in non-tradeables' domestic absorption that becomes unsustainable as it displaces the positive externalities of manufactured exports (Corden & Neary 1982, Wijnbergen 1984a, Neary & Wijnbergen 1986 and Sachs & Warner 2001). We differ in that Argentina's *endogenous* cyclical rise in the *domestic* currency export revenues produces a *recession* that depresses the growth trend below its equilibrium path. We coincide in that the natural resource sector's comparative advantage appreciates the currency[50] and displaces manufactured exports weakening the equilibrium growth path.

Figure 4.1: Per Capita GDP at 1990 prices - Australia, Argentina and Total Developed Countries 1930-2004



Source: Maddison (1997 and 2001) and IMF World Economic Outlook Database. For every country Maddison calculates the 1990 GDP with Geary-Khamis prices (Geary 1958 and Khamis 1972) and forecasts backs and forth using constant domestic prices GDP growth rates. For 1999-2004 own calculations using IMF's growth rates Developed Countries are Austria, Australia, Belgium, Canada, Denmark, Finland, France, Germany, Holland, Italy, Japan, New Zealand, Norway, Spain, Sweden, Switzerland, UK and USA. See Appendix A, Tables A.1 and A.2

Matsuyama (1992) discusses fertile-land abundant economies but considers neither institutional quality nor cycles. The evidence indicates that the 'Dutch Disease' tends to occur in 'fractionalised' (Hodler 2006) and/or low institutional quality (Mehlum, Moene & Torvik 2006) countries – with The Netherlands, ironically, as an outlier. The full determinants of Argentina's institutional quality require specific research. In this respect,

[50] In a large group of countries Sachs & Warner (2001) find that natural-resource abundant economies have a higher PPP average exchange rate to market exchange rate ratio than the rest of the economies which suggests that the natural resource PPP exchange rate depresses the average market exchange rate below the manufacturing PPP exchange rate.

however, my argument is that institutional quality becomes partially endogenous, as a result of the cycle.

In attempting to test his real business cycle model for Argentina's case, Kydland (2006:1380) finds 'discrepancy between model predictions and data'. According to Kydland & Zarazaga (1997:26-27) the deviation from trend of GDP and consumption in 1970-1996 in Argentina "is unusually high by international standards" [… and] "the volatility of consumption is larger than that of output, although theoretically the opposite should hold" [because perfect foresight would ensure the validity of Kydland's permanent income hypothesis]. Kydland & Zarazaga (2002) also find "discrepancies" between model and data in 1980-2000 but argue that fluctuations resulted from productivity shocks and inconsistent policies. Throughout the period 1953-2004 governments have tried every recipe in the book and repeatedly pursued outrageous fiscal and monetary policies[51] that led to hyperinflations and defaults with corruption ranking high in the international charts but, if our argument is correct, there is more to it than irresponsible governments. With endogenous uncertainty Kydland's 'perfect foresight' becomes a misleading theoretical over-simplification for Argentina's erratic policies are, in part, endogenous and are inconsistent attempts to overcome the recessive phase of the cycle.[52]

Our methodology may seem to belong to a bygone era in that the model is not tested but merely illustrated with descriptive statistical data and stylised facts. However, testing aggregate models for Argentina has always yielded meagre results. This may be due to poor quality data, as suggested by Kydland (2006:1380-1381) and/or to Argentina's high structural volatility (see right hand axis in **Figure 4.3)**. The only significant aggregate econometric estimates ever obtained are for the imports' elasticities, which we use. In this situation, our behavioural structural modelling – seldom used in frontier scientific research nowadays – would not seem inappropriate for it allows highlighting Argentina's main behavioural relationships and illustrating them with the available data. Unlike Kydland (2006) and Kydland & Zarazaga (1997 and 2002), we did not observe "discrepancies"

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[51] See Della Paolera & Taylor (2003) and Chudnovsky & Lopez (2007) for a discussion of economic policies in Argentina's history.

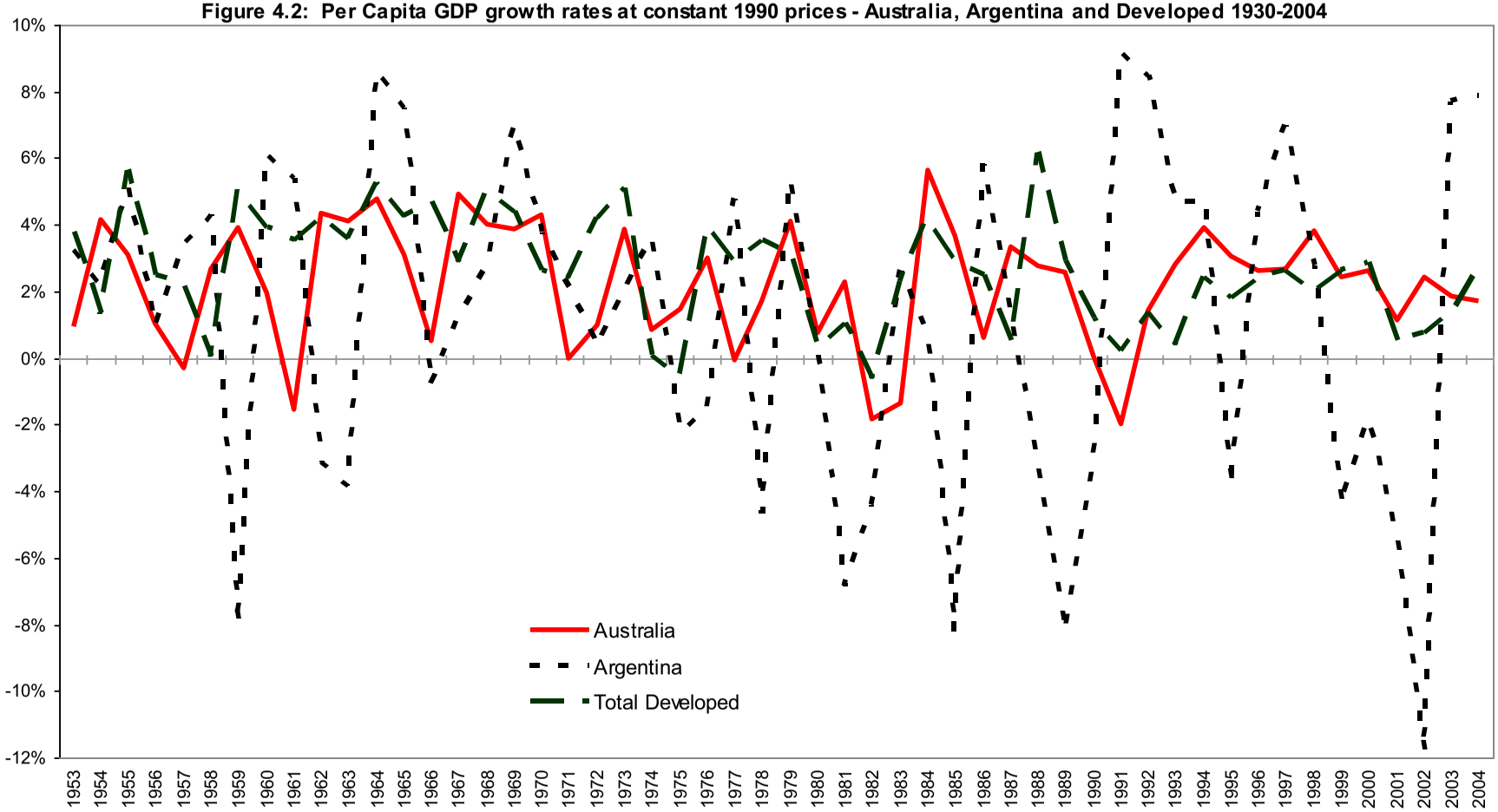
[52] The IMF short term stabilisation policy recommendations usually adopted at the start of the recessive devaluation when foreign reserves are depleted, deepen the recession. The alternative of postponing the adjustment by means of an increase in foreign debt, make the adjustment worse when it happens. Thus, policies are inevitably inconsistent unless they explicitly account for the dual equilibrium problem.

Table 4.1: GDP Growth Rates - Twenty Year Average - US Dollars at constant 1990 Geary-Khamis Prices

1905-1924		1915-1934		1925-1944		1935-1954		1945-1964		1955-1974		1965-1984		1975-1994		1985-2004	
Argentina	**4.6**	Taiwan	4.0	Canada	4.9	Germany	6.5	Taiwan	8.9	Taiwan	9.2	S. Korea	9.7	S. Korea	8.1	S. Korea	6.9
Brasil	3.7	Brasil	4.0	Turkey	4.1	Canada	5.7	Holland	8.8	Japan	8.8	Taiwan	9.4	Thailand	7.8	Thailand	6.3
Taiwan	3.6	Japan	3.8	Germany	3.9	México	5.4	France	8.4	S. Korea	8.4	Thailand	7.0	Taiwan	7.5	Ireland	6.0
Japan	3.6	**Argentina**	**3.4**	Brasil	3.7	New Zealand	4.9	Italy	6.8	Brasil	7.1	Japan	6.1	Chile	4.3	Chile	5.4
Canada	3.5	Chile	3.3	Japan	3.4	Brasil	4.9	Germany	6.8	Thailand	7.0	Brasil	6.0	Turkey	4.1	Taiwan	5.2
Chile	3.4	Finland	3.1	Finland	3.3	Turkey	4.5	Japan	6.4	Spain	6.9	México	5.6	Ireland	3.9	Turkey	4.2
Holland	3.2	S. Korea	3.0	Sweden	3.3	Austria	4.5	Turkey	6.3	Greece	6.6	Turkey	4.9	México	3.6	Australia	3.5
Australia	3.1	Norway	3.0	México	3.0	Holland	4.4	México	6.0	México	6.6	Greece	4.8	Japan	3.5	Spain	3.0
Denmark	2.9	Holland	2.7	S. Korea	2.8	Norway	4.1	Brasil	6.0	Portugal	5.9	Spain	4.8	Brasil	3.4	Portugal	2.9
New Zealand	2.9	Denmark	2.5	Chile	2.8	Sweden	3.9	Norway	5.8	Turkey	5.5	Portugal	4.5	Norway	3.4	Canada	2.9
Norway	2.8	Spain	2.3	**Argentina**	**2.8**	Taiwan	3.9	Austria	5.3	Austria	5.4	Ireland	4.1	Australia	3.1	Norway	2.8
Italy	2.7	Sweden	2.0	New Zealand	2.7	Japan	3.7	New Zealand	4.6	Italy	5.4	Norway	4.1	Portugal	2.9	Brasil	2.7
Finland	2.5	France	1.9	Australia	2.4	Australia	3.7	Finland	4.6	France	5.1	Canada	4.0	Canada	2.8	Greece	2.7
France	2.4	Germany	1.8	Denmark	2.0	Finland	3.6	Denmark	4.4	Canada	5.1	Australia	3.8	Greece	2.4	México	2.6
Spain	1.9	Australia	1.7	Norway	2.0	Chile	3.5	Spain	4.2	Germany	4.9	Finland	3.7	Austria	2.3	Finland	2.5
Sweden	1.6	Canada	1.5	Austria	1.7	Italy	3.5	Sweden	4.1	Finland	4.8	Austria	3.7	Italy	2.3	Holland	2.5
Germany	1.4	Italy	1.4	Taiwan	1.3	**Argentina**	**3.3**	Canada	4.0	Australia	4.7	Italy	3.6	Spain	2.2	New Zealand	2.3
Austria	0.9	New Zealand	1.3	Spain	1.1	Denmark	2.9	Chile	3.9	Holland	4.7	France	3.5	Holland	2.2	Austria	2.3
México		Austria	0.2	Italy	0.4	France	2.9	Australia	3.7	Norway	4.1	Holland	3.2	France	2.1	Japan	2.3
Greece		México		Holland	-1.4	S. Korea	2.7	S. Korea	3.6	**Argentina**	**4.1**	Germany	2.8	Denmark	2.1	Denmark	2.2
Ireland		Greece		France	-2.5	Spain	1.4	**Argentina**	**3.3**	New Zealand	4.0	Denmark	2.7	Finland	2.0	France	2.1
Portugal		Ireland		Greece		Greece		Greece		Denmark	3.9	**Argentina**	**2.7**	Germany	1.9	Sweden	2.0
Turkey		Portugal		Ireland		Ireland		Ireland		Sweden	3.8	New Zealand	2.7	**Argentina**	**1.6**	**Argentina**	**1.8**
S. Korea		Turkey		Portugal		Portugal		Portugal		Ireland	3.5	Sweden	2.5	Sweden	1.4	Italy	1.8
Thailand		Thailand		Thailand		Thailand		Thailand		Chile	3.3	Chile	2.5	New Zealand	1.4	Germany	1.6

Source: Source: Maddison (1997 and 2001) and IMF World Economic Outlook Database (2006). For every country Maddison calculates the 1990 GDP with Geary-Khamis prices (Geary 1958 and Khamis 1972) and forecasts backs and forth using constant domestic prices GDP grow. Blank spaces indicate that there is no data available. See Appendix A, Table A.1

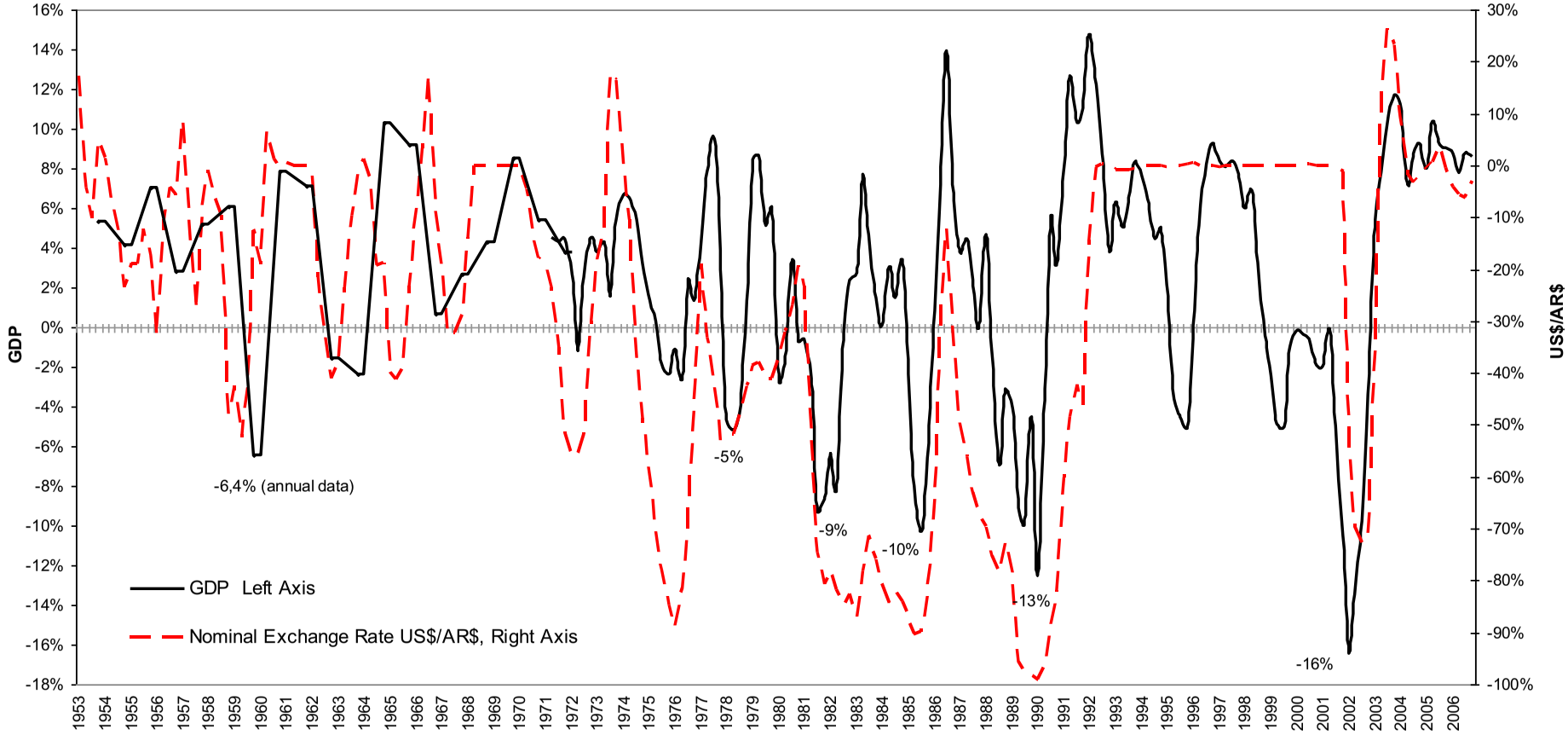
Figure 4.2: Per Capita GDP growth rates at constant 1990 prices - Australia, Argentina and Developed 1930-2004



Source: Maddison (1997 and 2001) and IMF World Economic Outlook Database. For every country Maddison calculates the 1990 GDP with Geary-Khamis prices (Geary 1958 and Khamis 1972) and forecasts backs and forth using constant domestic prices GDP growth rates. For 1999-2004 own calculations using IMF's growth rates. Developed Countries are Austria, Australia, Belgium, Canada, Denmark, Finland, France, Germany, Holland, Italy, Japan, New Zealand, Norway, Spain, Sweden, Switzerland, UK and USA. See Appendix A, Tables A.1 and A.2

Figure 4.3 : Argentina's GDP at constant 1993 prices and Nominal Exchange Rate

Rates of Change Same Quarter Previous Year (annual data prior 1970)



Source : GDP 1950-79 from Central Bank of Argentina www.bcra.gov.ar, 1980 onwards Ministry of Economy of Argentina www.mecon.gov.ar - No quarterly data available prior 1970; Free Market Exch Rate: Period 1953-97 from FIEL, www.fiel.org.ar, from 1998 onwards from Central Bank of Argentina www.bcra.gov.ar

between our theory and the data, since high consumption volatility is to be expected in a wage goods exporting economy of dual equilibrium.

None of the above contributions deal with Argentina's complete growth cycle, which is our objective. Let us begin with the simplest model and gradually built on as the argument unfolds. The mathematics is a simple skeleton which provides a basis for the discussion and enables us to understand the conditions under which the argument and the conclusions are valid.

1. The long run in 1953-2004

1.1. The Purchasing Power Parity (PPP) exchange rates

Assume that Argentina exports two bundles of goods: food and low technology manufactures, and that has no influence over world prices and/or quantities. Additionally, assume for now that a) these two bundles of goods are inputs in its own production; b) world output and the wage rate are given; and c) prices are set as a mark-up on costs as in:

(1) $p_i^j = (1+\eta)\,(\mu^j\ \alpha_i^j + p_i^j\ \xi_i^j)$

(2) $\psi_i = p_i^a / p_i^w$

(3) $\alpha_1^w = \alpha_2^w$ and $\xi_1^w = \xi_2^w$

(4) $\alpha_2^w = \alpha_2^a$ and $\xi_2^w = \xi_2^a$

(5) $\alpha_1^a\ \mu^a / \mu^{sub} < \alpha_1^w$ and $\xi_1^a < \xi_1^w$ high land fertility in Argentina

where

i : {1 (food) ; 2 (industry)}
j : {a (Argentina) ; w (rest of the world)}
p : price
α : labour time to output ratio
μ : wage per unit of labour time
μ^{sub} : subsistence wage labour ratio
ψ : purchasing power parity exchange rate
η : mark-up
ξ : input-output coefficient

From (1) and (3) → $p_1^w = p_2^w$ indicating that world prices of a unit of equivalent output are equal (say a ton of soya trades for a simple engine in the world market). Argentina's manufacturing technology (4) and labour costs μ^a are set by international competition net of transportation costs. Thus, $\mu^a=\mu^w$ and from (1), (2) and (4) → $\psi_2=1$ indicating that Argentina's manufacturing unit cost and price are equal to those of the rest of the world (at ψ_2 the above mentioned world tradeable engine trades for a similar engine in Argentina).

From (1), (2), (5) and $\mu^a = \mu^w$

$$(2') \quad \psi_1 = \frac{\alpha_1^a[1-\xi_1^w(1+\theta)]}{\alpha_1^w[(1-\xi_1^a(1+\theta)]} < \psi_2 = 1$$

this inequality, which holds even with subsistence wages,[53] indicates that Argentina has:

A) a labour demand per unit of internationally equivalent output much lower for agriculture than for manufacturing.

B) two remarkably different PPP exchange rates and a comparative advantage in agriculture.

We may assume a continuity of goods each one with its own PPP ranging from ψ_1 to ψ_2. In every economy, at any point in time, different sectoral PPP exchange rates co-exist and resources tend towards the comparatively most advantageous one, thus maximising trade, output and income (Ricardo 1821, Bhagwati 1964, Chipman 1965a 1965b and 1966 and Dornbusch et. al. 1977). In Argentina, this process does not operate as in the standard case. Under Argentinean conditions, ψ_1 and ψ_2 attract resources in opposite directions. This is discussed below.

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[53] If $\alpha_2^w < \alpha_2^a$ y $\xi_2^w < \xi_2^a$ in (4), Argentinean manufacturing costs would increase and (ψ_2–ψ_1) would rise. If $\mu^a<\mu^w$, then (ψ_2–ψ_1) would diminish but inequality (5) determines that $\psi_2>\psi_1 \; \forall \; \mu$, even if $\mu^a=\mu^{sub}$. If imported capital goods were considered, Argentina's technological gap would set the corresponding PPP exchange rate well above ψ_2, indicating strong comparative disadvantages and hence the lack of a domestic capital goods industry.

1.2. The equilibrium growth paths in 1953-2004

One hundred years ago Argentina specialized in agriculture. Since then it has been the world's leading per capita food exporter. Its industrial production, however, grew faster, and was twice as large as its agricultural production in the 1950s, and more than three times larger by 2004. Let us date Argentina's equilibrium in the 1953-2004 period when manufactured exports grew faster than agricultural exports, and consumer goods imports were less than 4% of total private consumption. Based on this evidence let us assume that inequality (5) is sufficiently strong so as to carry results A) and B) from above even though we relax the static simplifying assumptions a) to c).

An equilibrium exists when all agents maximize the intertemporal welfare that their resources would enable them to obtain without disadvantaging anyone else if perfect foresight allowed no mistakes in their decisions (Hahn 1984).[54] To the extent that agents perceive its convenience such equilibrium attracts their resources. As two sectors within Argentina have remarkably different price systems and equilibrium growth paths associated with ψ_1 and ψ_2, the economy has two attracting equilibria. To discuss this assume macroeconomic balance and that the following relationships hold. As will become clear in the solutions, when i=2 the fixed ψ_1 in (7) and (17) yields the duality that diminishes with time:

(6) $\hat{N} = f[(1-x_1), \omega_2]$ with $\delta f/\delta(1-x_1) > 0$; $\delta f/\delta\omega_2 > 0$;

$$\hat{N}^s / \hat{N}^d > 1 \text{ if } \hat{N} > 1 \text{ and } \hat{N}^s / \hat{N}^d < 1 \text{ if } \hat{N} < 0$$

(7) $\psi_i \omega_2 = 1 - \psi_i \omega_1 - \psi_i \pi - \psi_1 \lambda$

(8) $\lambda = x_1 \lambda_a(\omega_1, x_{1,0}) + (1-x_1) \lambda_b(\omega_1) \quad 0 < \lambda_b < \lambda_a$

(9) $x_1 = X_1 / X \qquad x_{1,0} \approx 0.96$

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[54] This equilibrium definition does not imply general equilibrium of the Arrow-Debreu type (GE) with perfect world wide factor mobility. From a GE stand point, in our model the lack of international capital mobility (into the Argentinean agricultural sector) determines the two different sectoral PPPs. The lack of labour mobility (immigration barriers at the industrialised countries with higher wages) induces Argentina to import structural unemployment from the rest of Latin America.

(10) $\hat{X}_2 = \hat{X}_1^d + \varepsilon_{\psi,x} \hat{\rho}$

(11) $\varepsilon_{\psi,x} = (\hat{X}_2^d - \hat{X}_1^d)\, \psi_2 / (\psi_2 - \psi_1)$

(12) $\hat{X}_1(\psi_1) = \hat{X}_1^d$

(13) $\hat{X}_1^d < \hat{X}_2^d$ with $\hat{X}_2^d \approx 2\ \hat{X}_1^d > 0$

(14) $X = X_1 + X_2$

(15) $\hat{M} = \varepsilon_{y,m} \hat{Y} + \varepsilon_{\rho,m} \hat{\rho}$ $\varepsilon_{y,m} \approx 3.4$; $\varepsilon_{\rho,m} \approx -0.46$

(16) $\hat{\rho} = \rho\,(M - X)$

(17) $x_{1,t}\, \psi_1\ \hat{X}_1 + (1-x_{1,t})\, \psi_i\ \hat{X}_2 = \psi_i\ \hat{M}$

(18) $M_0 = X_{1,0} + X_{2,0}$

(19) $Y = Q$

Endogenous variables:

M imports volume
N employment
Q potential output
X exports volume
x_1 food exports to total exports
Y national income and GDP
$\varepsilon_{\psi,x}$ exchange rate elasticity of supply of exports
λ Ricardian land rent share in national income
ρ foreign currency market exchange rate (AR$/US$)
ω_2 manufactured wage goods demand to GDP ratio

Exogenous variables:

X^d demand for exports volume
$\varepsilon_{y,m}$ income elasticity of demand for imports
$\varepsilon_{\rho,m}$ exchange rate elasticity of demand for imports
π profit share in national income
ω_1 food wage goods demand to GDP ratio

$\bar{}$ a line above a variable indicates its equilibrium value

$\hat{}$ a hat above a variable indicates its rate of change over time

^{d,s} ‘d’ and ‘s’ as superscripts indicate demand and supply respectively

Let us highlight assumptions that are not necessarily captured in the equations above. The demand for labour (6) is a direct function of the industrial production share in GDP that is captured by ω_2 and by $(1-x_1)$ X/Y. Argentina is open to immigration from countries with structural unemployment and low wages. Thus, labour supply is not a growth constraint ($\hat{N}^s / \hat{N}^d > 1$ if $\hat{N} > 1$), although it is not perfectly elastic and wages are above subsistence level. Immigration barriers in higher wage countries lock-in structural unemployment in Argentina for labour would naturally not migrate back to low wage countries. Therefore, whenever employment falls ($\hat{N} < 0$) labour supply becomes relatively inelastic. All capital goods embodying new technology are imported from and produced for the industrialised markets. This prevents the choice of labour-intensive techniques that would permanently absorb such structural unemployment (Findlay 1970 and 1979). Thus, for simplicity let us assume constant technical coefficients within the relevant production range.

In (7) income is distributed among wages, profits and Ricardian land rent. Each one of these components is converted onto domestic prices at the relevant PPP exchange rate. Food wage consumption is inelastic (constant ω_1). In equilibrium, landowners value their income λ in domestic prices at ψ_1 and entrepreneurs facing international costs value their income and costs at ψ_2. A similar duality appears in the foreign trade (17) where each flow (X_1 and X_2) is converted onto domestic currency at the corresponding equilibrium rate.

At any point in time, agriculture shows diminishing returns that generate land rent λ (8). For clarity, technological change in agriculture is such that λ does not change through time as output grows, but λ changes with the share of food in total production [$\delta\lambda/\delta(\omega_1,x_1)>0$]. Following Ricardo, landowners' incentives differ from entrepreneurs' incentives in that the former need not re-invest earnings in order to stay in business.

In 1950-2004, world trade in manufactures grew approximately twice as fast as world trade in food because world demand is non-homothetic and the demand for food has a lower income elasticity than the demand for manufactures. World exports p.a. growth rates were 6.4% for food and 11.1% for manufactures in 1950-2004. **Figure 4.4** shows the

volumes[55] of world exports of manufactures, agricultural goods and world GDP (for clarity fuels and minerals are not drawn in the figure but its growth rate is quoted in the table within the figure's area). Clearly, agricultural goods' exports and GDP grew at a similar pace, whereas minerals and fuels grew faster and manufactures much faster than GDP. The p.a. growth rates of exports volumes in 1950-2004 were 3.6% for agricultural goods, 4.2% for minerals and fuels and 7.5% for manufactures. World GDP at constant prices (volume) grew at 3.7%. This evidence is in line with Hooper et. al. (2000), Krugman (1989) and Marquez (1999) and indicates a lower income elasticity of demand for staple goods than that for manufactures (roughly ≈1 and ≈2 respectively in our simple calculation), which is also in Prebisch (1950), Myrdal (1957) and Hirschman (1958) and in recent international trade models (i.e. Flam & Helpman 1987, Matsuyama 2000, Stokey 1991, Taylor 1994 and Young 1991). Note that the ratio between manufactures and agricultural goods growth rates is approximately two (≈2) regardless of whether values or volumes are accounted for, indicating that the terms of trade effect is unimportant. Let us thus approximate the relative magnitude of $\hat{X}_2^d$ as twice that of $\hat{X}_1^d$ in (13). Argentina is a "price taker" and has no influence over the prices of its imports or exports.

Figure 4.5 shows world exports of manufactures, minerals and fuels and agricultural goods in current US$ dollars. Clearly, agricultural exports grow slower than the rest. Therefore, in specializing in minerals and fuels exports a natural resource abundant economy, such as Australia, improves its long term export income relatively to Argentina.

Argentina's Industrial development is depicted in the share of manufactured exports of industrial origin in total exports ($1–x_1$) that reduces land rent share in national income λ (8) which, in turn, increases the demand for manufactured wage goods ω_2 (7). This ($1-x_1$) share rose from 4% average in 1950-1960 to 30% in 1995-2004. The p.a. growth rates in 1953-2004, were 11.0% for manufactured and 5.8% for agricultural exports in current US$. The equivalent rates were 8.6% and 3.4% in constant US$ prices - see **Table 4.2** below.

[55] 'Volumes' are values deflated by the corresponding price index; therefore the terms of trade effect is excluded

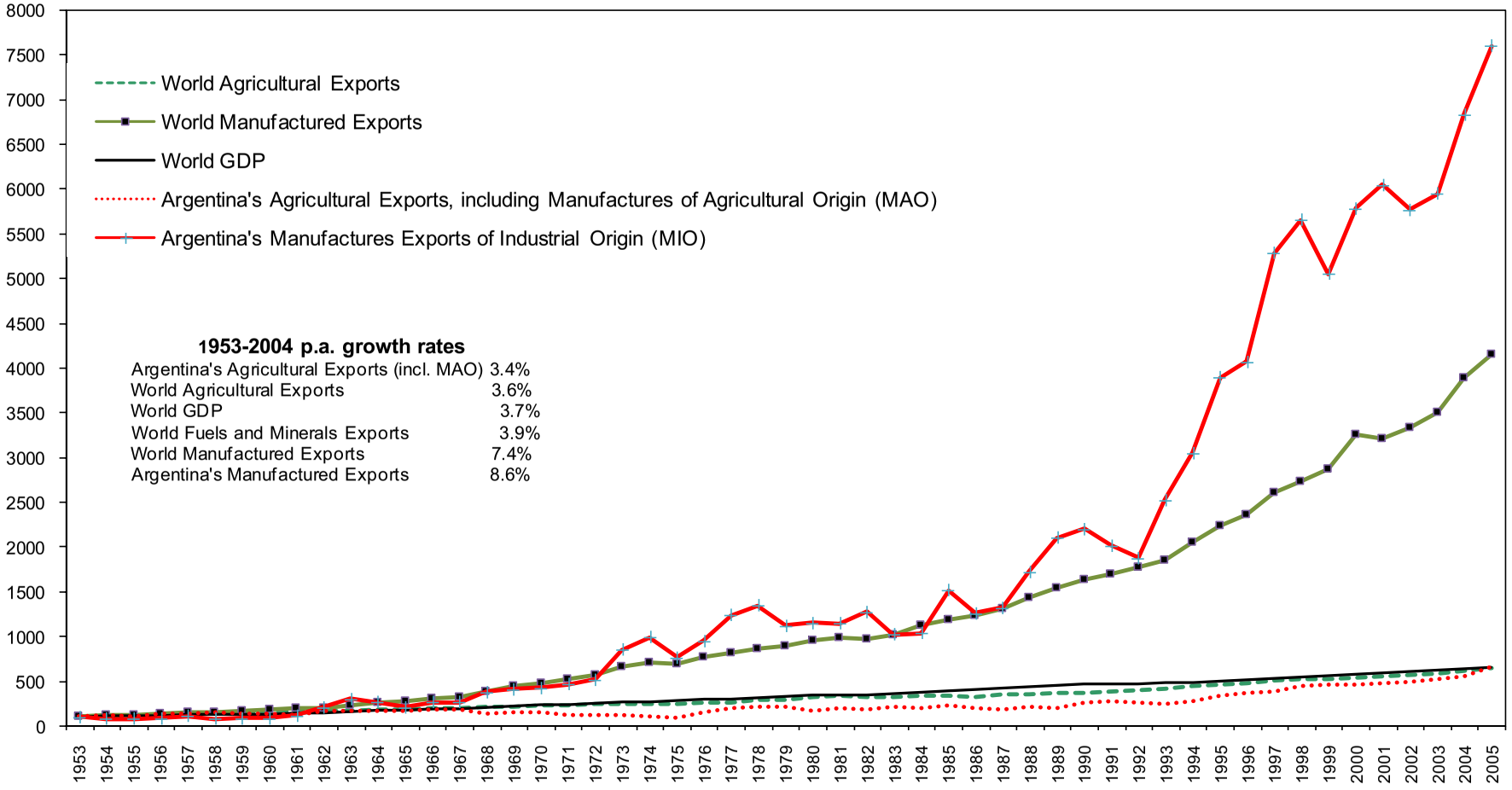
Table 4.2: Exports growth rates in 1953-2004			
		World	Argentina
Value	Manufactured	10.9%	11.0%
	Agricultural	6.6%	5.8%
	Ratio Manuf/Agr	1.65	1.90
Volume	Manufactured	7.4%	8.6%
	Agricultural	3.6%	3.4%
	Ratio Manuf/Agr	**2.06**	2.53
Source: World Trade Organization, Economic Commission for Latin America and Instituto Nacional de Estadística y Censos of Argentina			

Imports are mostly capital and intermediate goods demanded by industry. Long-term import demand elasticities in (18) are simple averages of the cointegration and error correction estimates obtained in Chapter 3 for 1970:Q1–2004:Q4. These estimates are $\varepsilon_{y,m}$=3.52 and $\varepsilon_{\rho,m}$=–0.36 applying Engle & Granger' OLS, and $\varepsilon_{y,m}$=3.29 and $\varepsilon_{\rho,m}$=–0.56 applying Johansen & Juselius' Maximum Likelihood. Cline (1989:155) estimated $\varepsilon_{y,m}$=2.42 and $\varepsilon_{\rho,m}$=–0.32 for 1973:Q1-1987:Q4. With annual data for 1947-1965, Diaz Alejandro (1970) obtained $\varepsilon_{y,m}$=2.60 and no significant estimates for $\varepsilon_{\rho,m}$. **Figure 4.6** illustrates the correlation between imports and GDP (note the 9 to 1 scale difference between the two vertical axes). A high $\varepsilon_{y,m}$ occurs because new manufactures have an income elasticity higher than unity (non-homothetic preferences) and an import coefficient larger than the economy's average in their input production chain[56] (Vernon 1966 and Bruton 1998).

With the balance of payments permanently in balance, the market exchange rate ρ in (16) adjusts instantaneously to changes in X and M.

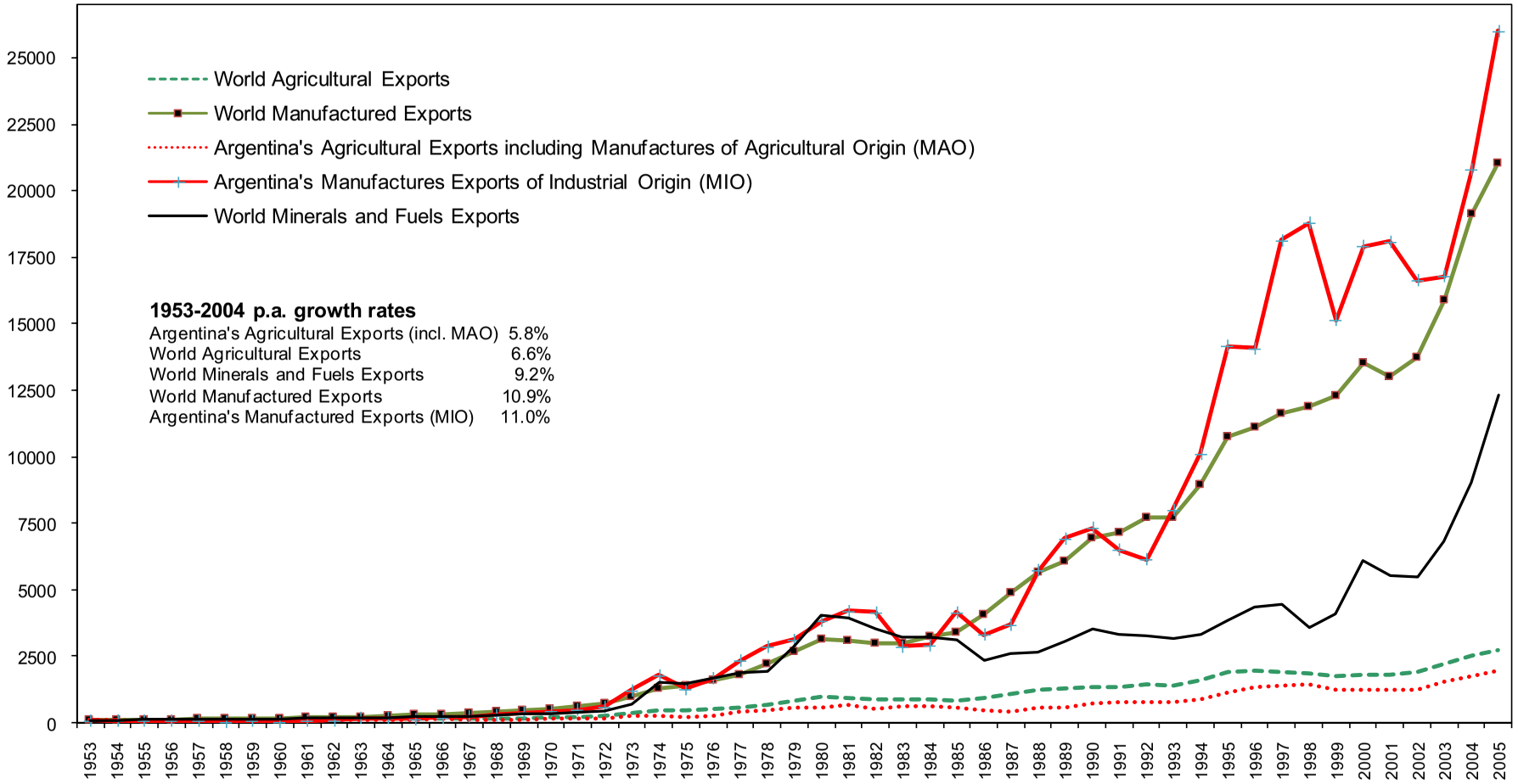
[56] This has the additional effect that during industrialisation new manufactures generate more imports than those they substitute, which only reinforces the argument of the external constraint to growth.

Figure 4.4: World and Argentina's GDP and Exports, volumes, index numbers 1953=100



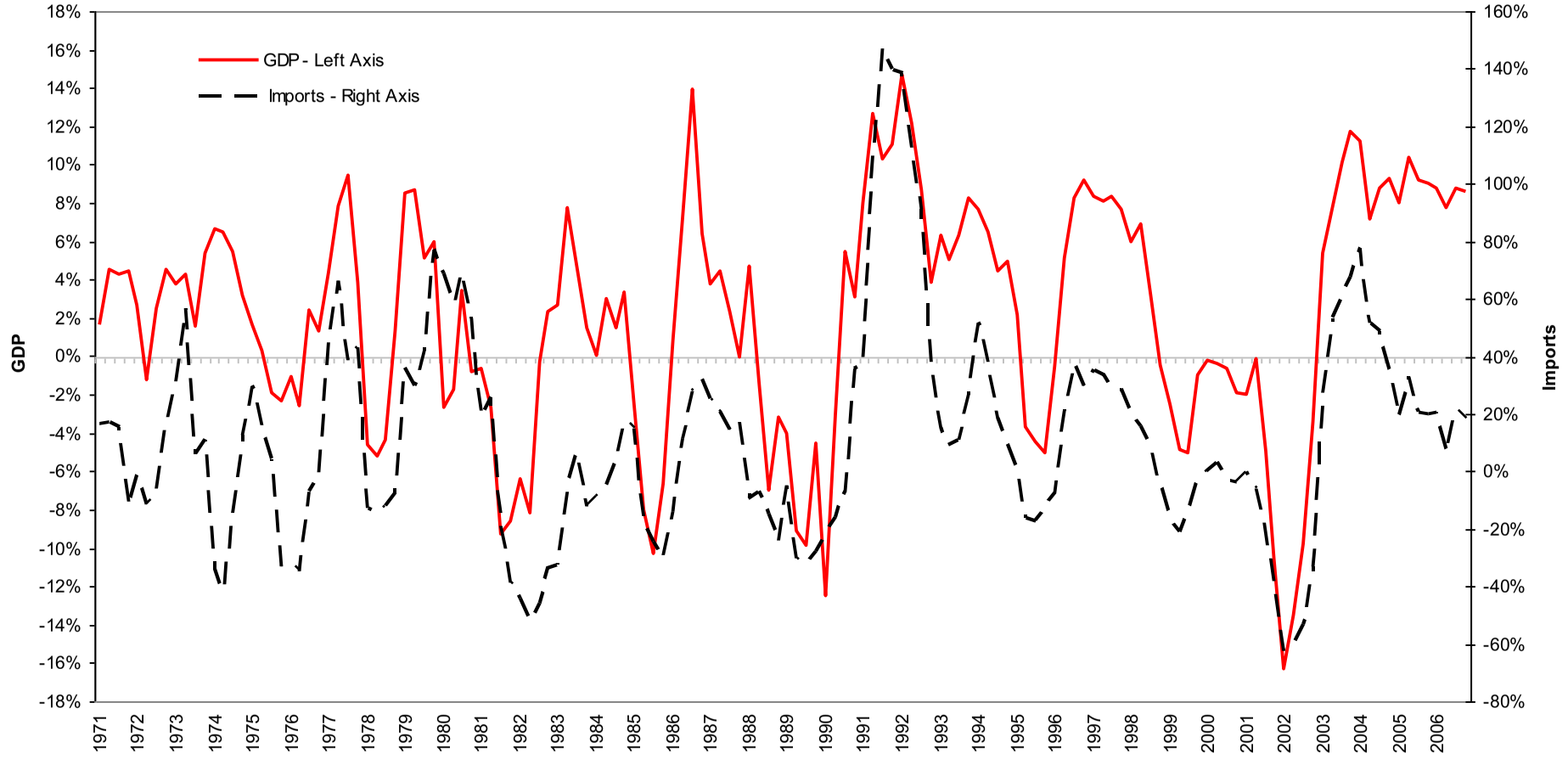
Source: *World data from International Trade Statistics,Table II.1 "World merchandise exports, production and gross domestic product", World Trade Organization, www.wto.org; Argentina data from INDEC www.indec.gov.ar and ECLA www.eclac.org. See Appendix Tables A.5 and A.7*

Figure 4.5: World and Argentina's Exports, Current US$ Prices, Index Numbers 1953=100



Source: World data from International Trade Statistics, Table II.1 "World merchandise exports, production and gross domestic product", World Trade Organization, www.wto.org; Argentina data from INDEC www.indec.gov.ar and ECLA www.eclac.org. See Appendix I Tables A.5 and A.7

Figure 4.6: GDP and Imports at Constant 1993 Prices - Growth Rates Same Quarter Year Before



Source: Instituto Nacional de Estadística y Censos of Argentina (INDEC) at the Ministry of Economy www.mecon.gov.ar and Economic Commission for Latin America and the Caribbean (ECLA) www.cepal.gov.ar

With a relatively elastic labour supply and abundant natural resources, growth is set by the possibility of importing capital goods and technology (Prebisch 1950, Chenery & Bruno 1962 and McKinnon 1964). Thus, from (9) (10) (11) (12) (14) (15) (16) (17) (18) (19) and assuming $\hat{\rho} = \hat{\psi}$, potential equilibrium output grows at

$$(23) \qquad \hat{\bar{Q}}_t = \frac{x_{1,t}\ \hat{X}_1^d\ \frac{\psi_1}{\psi_i} + (1 - x_{1,t})\ [\hat{X}_1^d + \bar{\varepsilon}_{\psi,x}\ \frac{(\psi_i - \psi_1)}{\psi_i}] - \varepsilon_{\rho,m}\ \frac{(\psi_i - \psi_1)}{\psi_i}}{\varepsilon_{y,m}}$$

where food exports x1 grow with external demand $\hat{X}_1^d$ weighted by the exchange rate ratio ψ_1/ψ_i that equalises domestic and international relative prices to comply with the 'law of one price' as in $\frac{p_1^a}{p_2^a} = \frac{\psi_1}{\psi_2}\frac{p_1^w}{p_2^w}$. With i=2, the exchange rate elasticity $\varepsilon_{\psi,x}$ (11) enables a higher growth rate $\hat{X}_2^d$ for manufactured exports $(1–x_1)$ and hence for Q (20). Foreign debt service θD, capital outflow H and international reserves accumulation dR, for simplicity here assumed to be nil, all reduce net imports and hamper $\hat{\bar{Q}}_t$.

With i=1, $\rho=\psi 1$ in (20) and exports grow at the world demand for food rate $\hat{X}_1^d$; industry would supply mostly the domestic market and manufactured exports would remain a constant fraction $(1–x_1)$ of total exports[57]. Food would account for a large fraction of wages – high ω_1/ω_2 in (7). As a function of the relatively high x_1, land rent share λ_t would be large and constant (8) and labour demand would grow sluggishly (6). The relatively elastic labour supply would keep unemployment high and real wages $(\omega_1+\omega_2)$ low – a low wage labour ratio μ^a in (1). The abundant supply of foreign exchange would validate the relatively low exchange $\rho=\psi_1$. At i=1 agriculture is in equilibrium for agents in this sector have no incentive to change their relative position. Industry, however, is not. With high unemployment low real wages and reduced prices of imported capital goods those firms with a competitive edge (their own ψ relatively close to ψ_1 because of a high import coefficient) find resources readily available to meet a fast growing external demand for

[57] For simplicity we rule de-industrialisation out although it occurs relative to the rest of the world where manufacturing grows faster than agriculture.

manufactures. Capital goods imports, faster GDP growth and the large $\varepsilon_{y,m}$ would raise ρ towards ψ_2 drawing additional firms into the export market. Thus, i=1 is not stable[58].

For completion, consider $t\rightarrow\infty$. In i=1 as the marginal land fertility equals that of the rest of the world, domestic and international relative prices meet at the single exchange rate; Argentina would then restart its industrialisation. In i=2, $x_{1,t}\rightarrow 0$, with full industrialisation $\hat{\overline{Q}}_t$ would reach a maximum.[59] Here food is mostly consumed internally, thus $\lambda_t\rightarrow$minimum $\lambda_b(\omega_1)$ in (8). Wage demand mostly includes manufactures (low ω_1/ω_2).

Now the 1953-2004 dual equilibrium case that we focus on. In i=2 with no particularly high values of "t", (20) yields

$$(20.1)\qquad \hat{\overline{Q}}_t = \frac{x_{1,t}\frac{\psi_1}{\psi_2}\hat{X}_1^d + (1-x_{1,t})\hat{X}_2^d - \varepsilon_{\rho,m}\frac{(\psi_2-\psi_1)}{\psi_2}}{\varepsilon_{y,m}}$$

that gradually rises as $x_{1,t}$ declines with industrialisation[60]. Two equilibrium exchange rates co-exist and the market validates just one or none. If $\rho=\psi_1$ industry's imports would raise ρ towards ψ_2 as discussed above. If $\rho=\psi_2$, two disequilibrating effects occur. First, the manufactured wage goods share is lower by

$$(7.1)\qquad d\omega_2 = -\lambda(x_{1,t})\ (\psi_2-\psi_1)/\psi_2$$

which implies lower manufacturing employment growth (6) for a given x_1 at any point in time. Second, with $\rho=\psi_2$ (20.1) yields a higher growth rate

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[58] If real wages were high at i=1, non-homothetic demand would imply fast growing demand both for imported manufactures and for those produced domestically with a high import coefficient. Thus, whatever the real wage at i=1, imports would rise faster than exports putting pressure on the exchange because $\varepsilon_{y,m}$ is large and manufacturing demand grows faster than food exports.

[59] At $t\rightarrow\infty$ a Pareto Optimal General Equilibrium would be possible if the rest of the world was in full employment equilibrium with perfect capital and labour mobility, evenly distributed technology and uniform per-capita income. Whether the world tends to such a state is not part of our discussion. For a discussion of the restrictive assumptions for the existence and stability of a General Equilibrium of the Arrow & Debreu (1954) and Arrow & Hurwicz (1958) type see Scarf (1960) Gale (1963), Leijonhufvud (1968) and Arrow & Hahn (1971).

[60] Constant returns in agriculture through time – constant λ_t for any given x_1 and ω_1 in (8) – along with $\hat{X}_1^d < \hat{X}_2^d$, imply increasing returns in world manufacturing. With a loss of clarity, the same result is obtained with declining returns in agriculture through time and constant returns in manufacturing.

(20.2) $\hat{Q}_t = \hat{\overline{Q}}_t + \varphi_t$ with $\varphi_t = \frac{x_{1,t}}{\varepsilon_{y,m}} \frac{\hat{X}_1^d}{\psi_2} \frac{(\psi_2 - \psi_1)}{\psi_2}$

where φ captures the agricultural sector's excess foreign exchange. In equilibrium[61], entrepreneurs have no incentive to borrow φ. There is an oversupply of foreign exchange and $\rho \rightarrow \psi_1$. Even if a permanent fiscal surplus (disequilibrium) is assumed and the government purchases φ, the oversized reserve stock would eventually strengthen the local currency (depress ρ). Therefore, the equilibrium i=2 is not stable either. The market exchange ρ oscillates attracted by ψ_1 and ψ_2 over-supplying and undersupplying foreign exchange respectively. Thus we postulate

(21) $\overline{\sigma}(\rho) = \sigma[x_1,(\psi_2-\psi_1)]$ with $\sigma' > 0$ $\overline{\sigma}(\rho)$ = equilibrium Standard Deviation of ρ

Because Argentina exports wage goods, ρ affects most variables in the economy. Thus, in direct relation to the size of $(\psi_2-\psi_1)$ there are variations in quantities and in prices, which cannot be modelled or anticipated in any realistic way. Therefore, we assume endogenous uncertainty about the equilibrium position as a direct function of the relative importance of the agricultural sector captured in x_1, $\lambda(x_{1,t})$ and $(\psi_2-\psi_1)$.

2. The short-medium run

With high uncertainty about the equilibrium path (20.1) aggregate demand easily diverges from it. Thus equilibrium conditions are removed and equilibrium output is kept as an exogenous analytical benchmark in the medium run. From the previous section we keep the import function (15) only. Let us assume a fixed λ and re-write (7) (14) (16) (19) and (21), and add new equations for consumption, investment, savings and the balance of payments. Moreover, regard as constant the international rate of interest, the single export demand growth rate, the terms of trade[62] and domestic vis-à-vis foreign productivity differentials. This should allow us to focus on variables that depend mostly on local

[61] In equilibrium, firms maintain a stable debt-assets ratio to prevent lenders interference (Modigliani & Miller 1958, Tirole 2006 and Wood 1975). Borrowing φ would alter this.

[62] These three factors played favourably in the buoyant 2003-2007 recovery. A long-term fall in the terms of trade resulting from the low income elasticity of world demand for food (Prebisch 1950) would only reinforce the argument. The same goes for direct foreign investment that tends to be pro-cyclical (Gopinath 2004).

private agents' decisions. The cycle generates endogenous inflation and hence additional uncertainty that feeds back into the cycle.[63] We take uncertainty as a fact and assume all variables are in real terms (deflated by their relevant price index). "Currency depreciation" and "exchange rate appreciation" are synonymous (AR$*UScpi/US$*ARcpi).[64]

(7') $\omega_2 = 1 - \rho\,\omega_1 - \rho\,\pi - \rho\,\lambda$

(14') $\hat{X} = \hat{X}^d + \varepsilon_{\rho,x}\,\hat{\rho}$ with $\varepsilon_{\rho,x} \approx 0$

(16') $\rho = \rho\,(BP)$

(19') $S \equiv I_d + I_x + \rho\,X - \rho\,M$

(21') $\overline{\sigma(\rho)} \approx \sigma(\rho) = 45.2\ \%$ in the 1953:1-2004:4 period[65]

(22) $Y \equiv S + c\,Y$

(23) $c = \rho\,\omega_1 + \omega_2 + c_\pi\,\rho\,\pi + c_\lambda\,\rho\,\lambda$; $c_\lambda, c_\pi \in [0,1]$

(24) $I_d = I_d(Y,\theta D/X,q)$

(25) $I_x = I_x(X^d,\rho^e*,\theta D/X,q)$

(26) $\rho^e* = \rho^{a*} \pm \sigma(\rho)$ and $\delta\rho^e*/\delta\rho \approx 0$

(27) $q = q(\sigma(\rho))$ $q' < 0$

(28) $BP \equiv X - M - \theta D + dD - H - dR \equiv 0$

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[63] Accounting for inflation would reinforce the argument. With downward nominal price rigidity the change in relative prices during devaluation generates inflation (Olivera 1964) that generates uncertainty contributing to recession which contributes to generate the trade surplus that moves the real exchange rate in the opposite direction that moves relative prices which induces further inflation. Persistent inflationary expectations weaken the growth path. Apart from the obvious (responsible monetary policy, etc.), the solution to chronic inflation would have to account for Argentina's dual equilibrium and the cycle.

[64] Domestic prices of tradeables adjust instantaneously to the exchange because Argentina trades goods of low substitutability. Non-tradeable prices adjust slowly. Therefore, large variations in the real exchange imply variations in the prices of tradeables relative to non-tradeables (Burstein et. al. 2005). Argentina's CPI includes mostly non-tradeables and we use its ratio to the US's CPI to calculate the real exchange rate.

[65] In the period 1969:Q3-2005:Q4 the real exchange rate standard deviation $\sigma(\rho)$ was 52.2 % for Argentina but just 16.7 % for Australia (Reserve Bank of Australia www.rba.gov.au)

New endogenous variables	New exogenous variables
BP balance of payments c propensity to consume I_d : investment in domestic production dR Central Bank reserves variation I_x : investment in exportable goods S : private savings q institutional quality Notation ^{e} expected value * long term value ^{a} historical average	c_λ land owners propensity to consume c_π entrepreneurs propensity to consume D foreign public debt H private capital outflow R Central Bank reserves $\varepsilon_{\rho,x}$ exchange rate elasticity of supply of exports λ land rent share in national income θ discount rate = international interest rate + country's risk $\sigma(\rho)$ SD of the exchange rate (after dividing by mean and multiplying by 100)

Food is tradeable and has a low price elasticity and a low income elasticity of demand, consequently domestic food prices adjust instantaneously to the exchange ρ. Thus, for simplicity, domestic wage food demand ω_1 and land rent λ are priced in dollars in (7'). With international capital mobility firms' profits are also in dollars.

Manufactured goods demanded by wage earners ω_2 are produced domestically with a lower import coefficient than those demanded by non-wage earners. These goods (ω_2) represent a large fraction of total domestic manufactured output and are only marginally tradeable depending on the exchange rate. Thus their domestic prices adjust slowly to the exchange rate. Consequently, ω_2 in (7') is valued in pesos. Relative to food, these goods (ω_2) have a high domestic price elasticity and a high income elasticity of demand.

The real exchange rate historical standard deviation σ(ρ) is relatively large (45.2%) and we use it to approximate the equilibrium standard deviation $\overline{\sigma}(\rho)$ (21'). The expected long term exchange rate ρ^{e*} in (26) is formed with the historical average $\rho^{a}*$ and a margin error of ± σ(ρ).

Let us assume that government deficits are financed only with foreign debt and that all foreign debt is public and continuously refinanced. This enables us to exclude the government accounts from the mathematics and work with the balance of payments (28) only. The interest earned on private capital stored abroad, through private capital outflow H, remains abroad.

2.1. Domestic investment and the Multiplier-Accelerator

In Argentina imported consumer goods are relatively unimportant as a share of total private consumption. Assume that investment in the production of importable consumer goods and of non-tradeables have the same neutral foreign exchange balance effect for a given GDP[66], This enables us to aggregate both types of investment as "domestic investment" I_d.

The individual agent does not share information with competitors. With high uncertainty about future prices and quantities resulting from the dual equilibrium, domestic investment I_d in (24) easily diverges from the equilibrium and current demand becomes the main source of information about whether or not past decisions were correct. Thus, if the economy grows above (below) its equilibrium, individual agents perceive that their investment was insufficient (excessive). In correcting their individual "mistakes" agents drive aggregate demand further away from the equilibrium[67] as in the Keynesian multiplier-accelerator.

2.2. Export investment and the exchange rate

Given foreign prices and demand, export investment I_x in (25) is function of the expected long term exchange rate ρ^{e*}. A high $\sigma(\rho)$ leads to $\delta\rho^{e}*/\delta\rho \approx 0$ and makes investment unresponsive [68] to short-medium term exchange rate variations[69] (Darby 1999). Thus $\varepsilon_{\rho,x} \approx 0$ in (14') and exports grow solely at the export demand rate X^{d}. Argentina's foreign trade research has repeatedly yielded not significant estimates for $\varepsilon_{\rho,x}$ (i.e. Diaz Alejandro 1970 and Cline 1989). **Figure 4.7** illustrates the lack of correlation between the exchange rate

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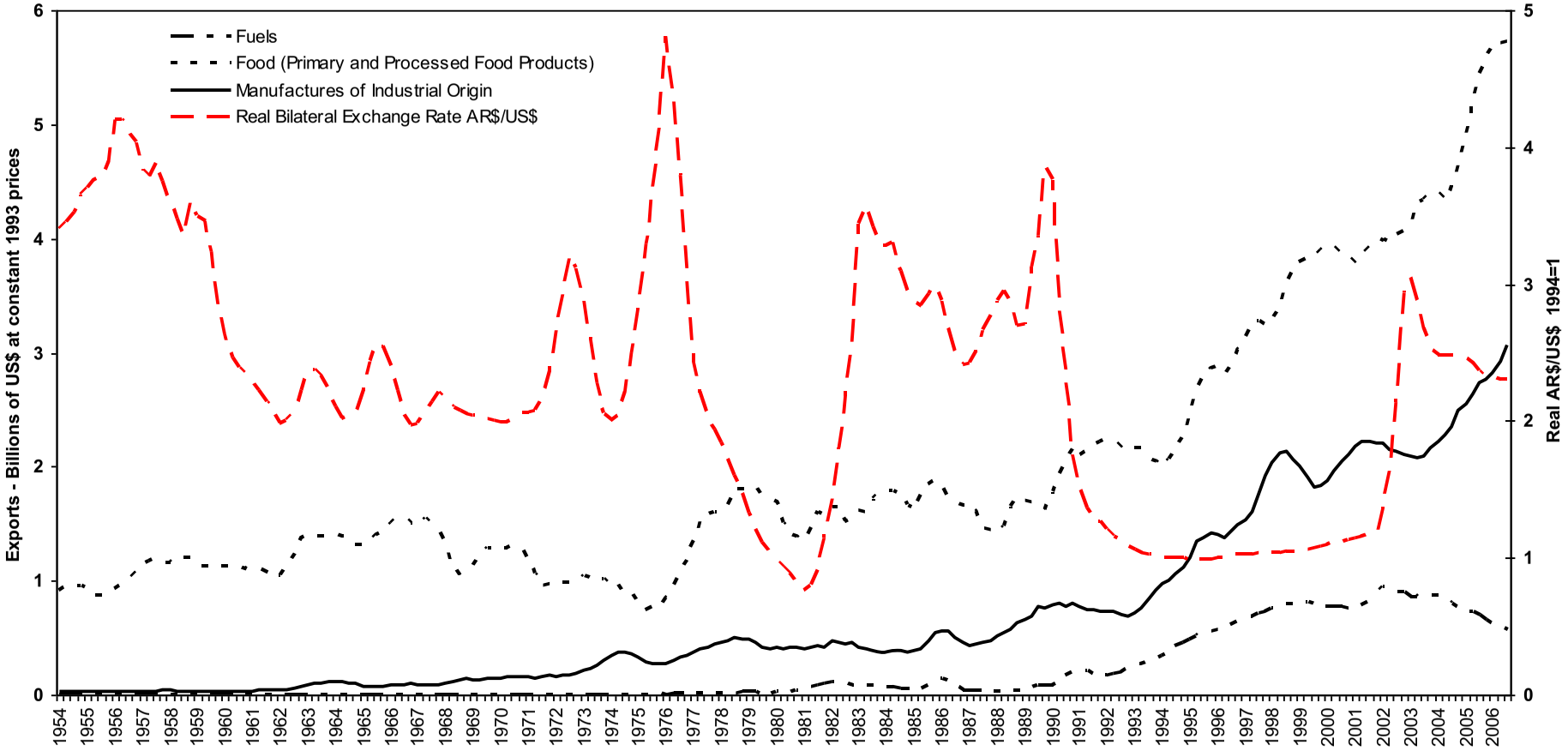
[66] Accepting that "import substitution" raises income elasticity of imports (Bruton 1998) would reinforce the argument.

[67] This self-fed instability generated by the lack of coordination among competing agents who seeking their individual benefit collectively harm their own interests is in Marx' *Das Kapital* when referring to "the anarchy of production" and was used by Kalecki (1935), Coase (1937), Harrod (1939) and Tintner (1942) among many others, and it was later prolifically developed by game theory and applied, for example, to currency attacks as in Morris & Shin (1998) and Bachetta et. al. (2006).

[68] Bloom et. al. (2007) find that uncertainty increases real option values making firms more cautious when investing or disinvesting

[69] If the high volatility of international food prices was considered, the cautious export investment in food exports would reinforce the low export supply elasticity argument (Alexander 1952).

Figure 4.7: Exports and Real Exchange Rate (AR$/US$) at Constant 1993 Prices, 4 Quarters Moving Average

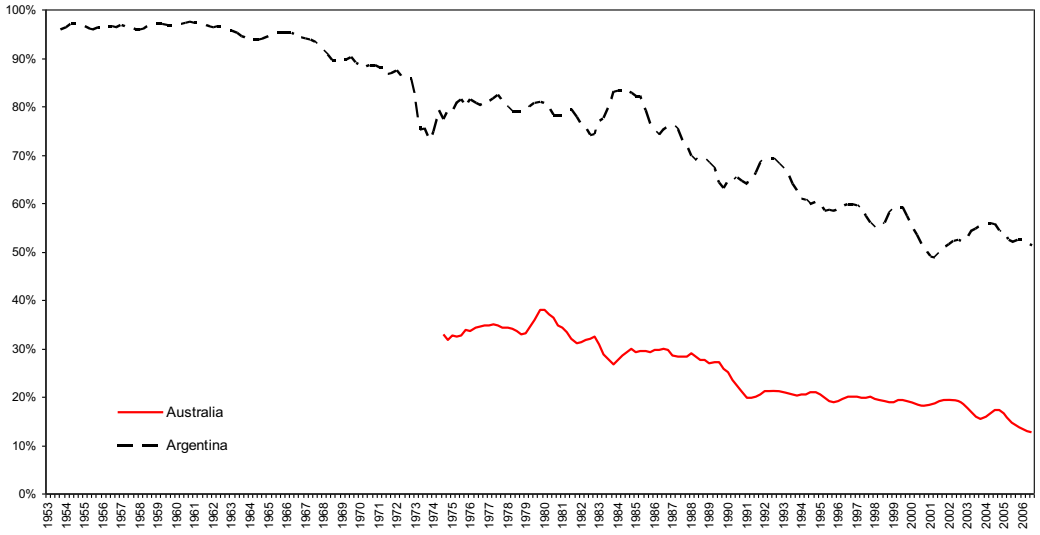


Source: Free Market Exchange Rate: 1953-97 FIEL, www.fiel.org.ar; 1998- onwards Central Bank of Argentina. Exports and prices: Instituto Nacional de Estadística y Censos of Argentina (INDEC) www.indec.gov.ar and Economic Commission for Latin America (ECLA) www.ecla.org; USA prices Bureau of Labour Statistics www.bls.gov/cpi

and exports[70]. Note, for example, that the fastest food export growth was during the prolonged 1991-2001 period of a remarkably low exchange rate ρ, indicating that ψ_1 might be near this value. Manufactures also grew fast from 1993 but decelerated after 1998. In this short-medium term model, however, we make no distinction between food and manufactured exports (14').

For illustrative purposes only, **Figure 4.8** shows the share of agricultural exports on total exports, in the cases of Australia and Argentina. Its relatively higher share of agricultural exports makes Argentina's aggregate demand particularly sensitive to severe exchange rate variations, as we shall argue in brief.

Figure 4.8: Agricultural Exports to Total Exports Ratio, Current US$, 4Q Mov. Aver.



Source: Australian Bureau of Statistics www.abs.gov.au (no data prior 1974). Argentina: 1953-1990 CEPAL, 1991 onwards INDEC.
Note: Agricultural Exports includes Processed Agricultural Goods (Manufactures of Agricultural Origin MAO)

Both domestic and export investments are[71]: a) negatively related to the exposure to changes in the international financial markets captured by θD/X (Corden 1988 & Helpman 1989), and b) positively related to institutional quality q that allows risks to be contractually hedged (Barro 1991 and Levine & Renelt 1992). Institutional quality q in (27) is, in turn, function of σ(ρ) that produces conflict over the distribution of income

[70] Quarterly data of exports, disaggregated by product and exchange rate variations net of terms of trade changes do not show significant correlations either.

[71] To include the effect of a large σ(ρ) in the country's risk and in the investment discount rate θ would only re-enforce the argument.

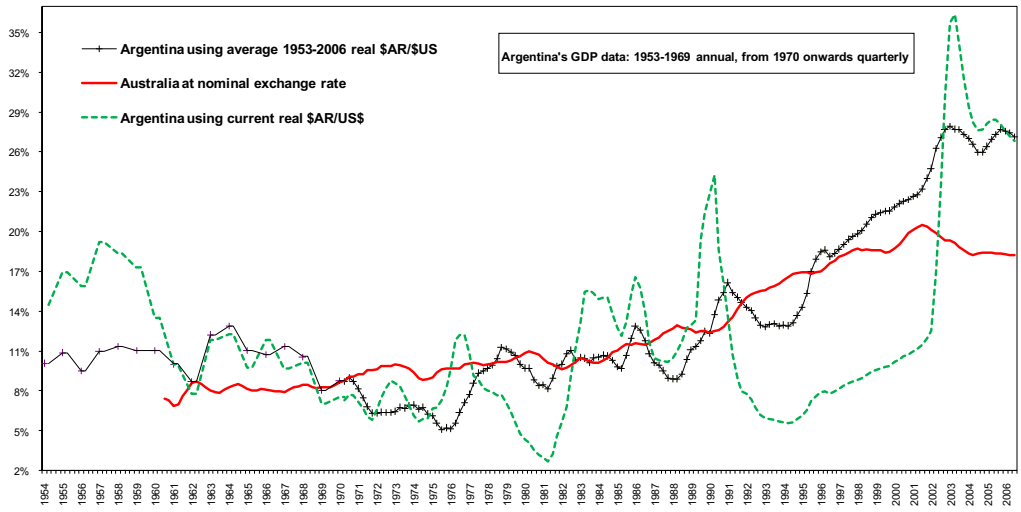
affecting the rule of law, government effectiveness and political stability (Persson & Tabellini 1994, Tornell & Velasco 1992 and Venieris & Gupta 1986).

3. The cycle

With the use of the above short-medium term model, let us discuss the cycle around an exogenous potential equilibrium growth path given by (20.1). The cycle is not parametrically modelled.

In Argentina, the exports to GDP ratio X/Y is low by international standards although it has increased from 10% average in 1953-1993 to 20% in 1994-2004 as the dotted line in **Figure 4.9** indicates. To calculate this ratio exports at constant US$ prices for 1993 were converted to AR$ with the average real exchange rate for the whole 1953-2006 period, thus eliminating the exchange volatility. For illustration only, **Figure 4.9** also shows Australia's X/Y ratio that was calculated using current (nominal) prices and the current (nominal) exchange rate. Note Argentina's higher variance in spite of the exchange rate correction. Let us focus on the case of Argentina. For lack of data, let us assume $I_x/I \approx X/Y$ and that the rise in this ratio in 1953-2004 was associated to the observed fall in x_1.[72]

Figure 4.9: Exports (including fuels) to GDP Ratio in Agentina and Australia, Constant Prices, 4 Quarters Moving Average



Sources: for **Argentina** free market exchange rate, 1998 onwards from Argentina's Central Bank (BCRA) and for 1953-1997 from FIEL. Exports and prices in 1953-1990 from ECLA and from 1991 onwards from INDEC. US CPI from Bureau of Labour Statistics. GDP from Central Bank and Ministry of Economy. For **Australia:** Australian Bureau of Statistics www.abs.gov.au

[72] A rise in X/Y with a constant x_1 would not lead to a proportional rise in I_x/I to the extent that high world price volatility induces cautious export investment in food exports (Alexander 1952).

3.1. The upswing

The initial conditions are in the fifties with t=0, i=2 and $\rho=\psi 1$ in the potential equilibrium (20.1), and $I_{x,0}/I_{d,0} \approx X_0/Y_0 \approx 0.11$ in the demand model above. Assume that GDP starts growing above its equilibrium. Through the multiplier-accelerator, GDP further diverges from its equilibrium. Through the high income elasticity of demand for imports $\varepsilon_{y,m}$ such disequilibrium is amplified in a trade account disequilibrium. Whenever dR=0 and dD=0, such trade deficit is corrected by

(29) $BP_0 + dBP = 0$

Assume, for simplicity, $H_0=0$, $X_0=M_0$ and $\rho_0=1$. From (14'), (15), (28) and (29) the currency depreciation that stabilises the balance of payments (the "*stability depreciation")* is

$$(29') \qquad d\rho^s = \frac{-\hat{X}^d + \varepsilon_{y,m}\hat{Y} + (\theta D + dH)/X}{\varepsilon_{\rho,x} - \varepsilon_{\rho,m} - \theta D/X} > 0$$

Here the low $\varepsilon_{\rho,x}$ and $\varepsilon_{\rho,m}$ imply a ***severe***[73] stability depreciation[74]. This depreciation is positively related with GDP growth $\hat{Y}$, with the foreign debt to export ratio $\theta D/X$ and with the capital outflow to export ratio dH/X.

The stability depreciation $d\rho^s$ raises the supply of savings for a given Y by

(22') $\delta S / \delta \rho = [(1-c_\pi)\,\pi + (1-c_\lambda)\,\lambda\,]\,Y$ from (7') (22) and (23)

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[73] The point elasticities in (31') can be extended to the case of arc elasticities without loss of generality (Olivera 1966).

[74] With export demand and import supply both perfectly elastic and exports denominated in dollars, depreciation can only have a positive effect in the trade balance. With $X_0=M_0$, the depreciation would have a positive effect on BP if $\hat{X}^d - \varepsilon_{y,m}\hat{Y} - dH/X < \theta D/X < \varepsilon_{\rho,x} - \varepsilon_{\rho,m}$. If the RHS inequality is not fulfilled, the trade surplus resulting from depreciation is insufficient to compensate for the foreign debt service. If the LHS inequality does not hold, a depreciation is not required. The recessive case $\hat{X}^d - \varepsilon_{y,m}\hat{Y} - dH/X > \theta D/X > \varepsilon_{\rho,x} - \varepsilon_{\rho,m}$ is ruled out as a price adjustment.

The depreciation raises the consumption of non-wage earners by $(c_\pi\pi+c_\lambda\lambda)d\rho$ in (23), which is spent mostly on goods with a higher than average import coefficient. The fall in the propensity to consume (23) that matches such increase in savings (22') comes through the fall in wages (7′). Given the price inelastic domestic demand for food relative to manufacturing – constant ω_1 in (7') – it is mostly the quantity of domestic manufactured demand that decreases by

(7'') $\qquad \delta\omega_2 / \delta\rho = -(\omega_1+\pi+\lambda)$

This induces a decline in domestic investment by $\frac{\delta I_d}{\delta\omega_2}\frac{\delta\omega_2}{\delta\rho}d\rho < 0$ for a given Y. If a government budget constraint was considered, feasible government expenditure would decline by $\theta D d\rho$ (the rise in the public foreign debt servicing).

3.2. The ceiling and the recession

Export investment demand I_x does not increase because $\rho^{e*}/\delta\rho^s \approx 0$ *(26)* and $\varepsilon_{\rho,x} \approx 0$ (14'). Thus, export entrepreneurs do not demand the additional savings (22').

The condition for $\delta Y/\delta\rho = 0$ is[75] (assume momentarily dH=0):

(30) $\quad [\pi(1-c_\pi)+\lambda(1-c_\lambda)]\, d\rho - Y^{-1}\frac{\delta I_d}{\delta\omega_2}\frac{\delta\omega_2}{\delta\rho}d\rho = [\hat{X}^d + (\varepsilon_{\rho,x} - \varepsilon_{\rho,m})\, d\rho]\, X/Y$

the foreign trade balance positive effect on the RHS is too weak compared to the decline in the domestic demand due to the rise in savings (wage cut) and the drop in I_d. Condition (30) cannot be fulfilled and the recession is inevitable: $\delta Y/\delta\rho < 0$.

The recession deepens due to the low income elasticity of domestic demand for food relative to manufactures. Entrepreneurs perceive having invested in excess and accelerate the decline. The GDP crosses its equilibrium from above.[76] The large $\varepsilon_{y,m}$ amplifies such recessive disequilibrium producing a large surplus in the trade account and, with dH=0, the Central Bank accumulates sufficient reserves and the depreciation stops.

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[75] From (14') (15) (19') (22') (23) and (28)

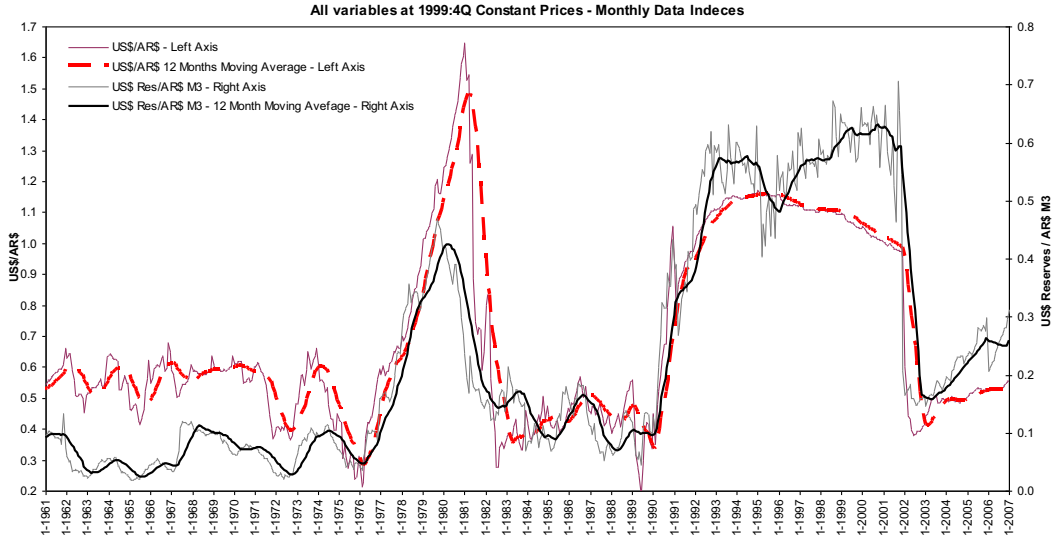
[76] The endogenous uncertainty makes the equilibrium path unobservable but we use it as a benchmark in the analysis

During a severe recessive depreciation bankruptcies increase (Goldstein 2005) and this affects the export sector that is connected with the rest of the economy through contractors and banks (Frankel 2005) which re-enforces $\varepsilon_{\rho,x} \approx 0$.

3.3. The capital account accelerator

Let us now allow for $dH(\rho) \neq 0$. A high $\sigma(\rho)$ unables the use of the historical average exchange rate ρ^{a}* as a proxy to its average equilibrium value and agents cannot calculate it. In search of a benchmark (Friedman 1953), agents look to α: the US$-Foreign-Reserves to AR$-M3 at constant prices ratio. **Figure 4.10** below shows that, after decades of inflation and permanent nominal exchange rate depreciation[77] (see right axis in **Figure 4.3**), from 1970 onwards the real exchange held a somewhat stable correlation with the

Figure 4.10: Argentina US$ Foreign Reserves to AR$ M3 Ratio and the Exchange Rate
All variables at 1999:4Q Constant Prices - Monthly Data Indeces



SOURCE : M3 (private deposits only) from 1990 onw ards from Argentina's Central Bank w w w .bcra.gov.ar, before 1990 from FIEL w w w .fiel.org.ar; Reserves from IMF-IFS. Free Market Nominal Exchange Rate: 1953-97 from FIEL and 1998-2004 from BCRA. Real values obtained by deflating by the US-CPI w w w .bls.gov and Argentina's CPI w w w .indec.gov.ar

[77] Such chronic nominal depreciation also led to the collapse of long term private lending, saving and borrowing in domestic currency. Thus, domestic credit has been a small fraction of GDP (around 20%) and concentrated in short term consumer credit either denominated in foreign currency or with high (indexed) real interest rates This weakens the effectiveness of monetary policies.

one year moving average of α. This correlation is much less evident when using monthly data and it disappears with daily data; thus, α is not a good substitute for the equilibrium exchange rate but it is the best available option. Consider now an expected rate of return on domestic expenditure β used by residents (mostly non-wage earners) to decide upon domestic consumption (expected rate of satisfaction) and domestic investment (expected rate of profit) and add equations (31) and (32) below, which are en extension of Olivera (1970), Dornbusch (1976), Krugman (1979) and Krugman (1996).

(31) $\rho_j^e = f(\alpha_j^e, \alpha_j^*)$ *with* $\alpha = R/M3$

(32) $H = \sum_j h_j(\hat{\rho}_j^e + \theta - \beta_j)\ DY_j / \rho$

h dollar preference	j agent
M3 money	β expected return on domestic expenditure, in pesos
DY : disposable income	α* : threshold below (above) which the Central Bank is unable (able) to defend the exchange rate

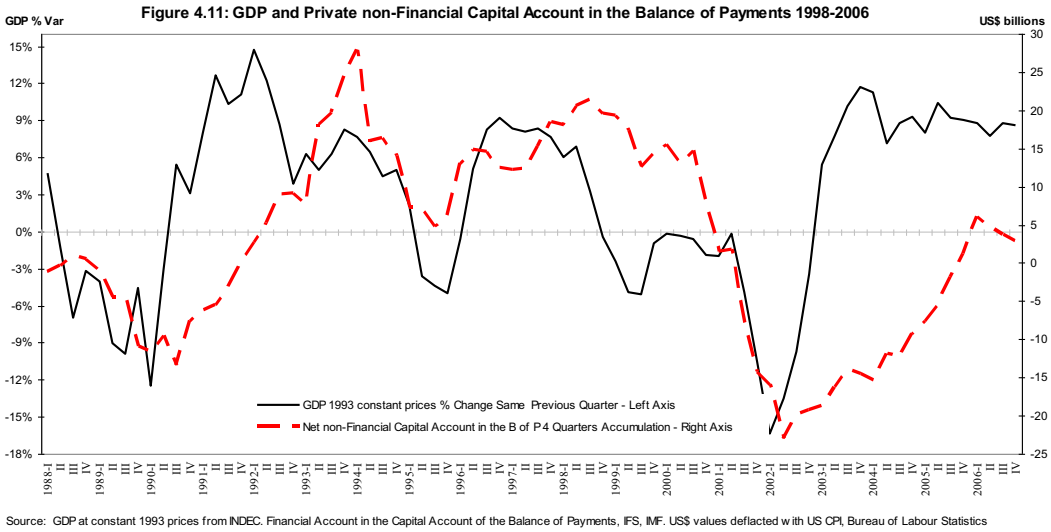
In (31) and (32) agents in the foreign exchange market do not coordinate decisions for they compete for the premium in anticipating the start (end) of the devaluation and they know a) that σ(ρ) is large; b) the sign but not the timing of the next large variation in ρ; c) that the Central Bank tries to reduce σ(ρ); and d) that the exchange rate holds an approximately stable long-term relationship with α=R/M3[78] – as discussed above with **Figure 4.10.** Thus each agent "j" sets a personal[79] threshold α_j* (31) above (below) which they expect that the Central Bank will (will not) be able to defend the currency. When agent j expects α_j^e to be below (above) their private threshold α_j^*, they expect currency depreciation (appreciation) and if this exceeds (fails) the net return of their domestic expenditure (β_j-θ) in (32), they arbitrage demanding (selling) dollars. Since each agent

[78] Engel & West (2005) find that the exchange rate and the "fundamentals" are correlated according to the Asset Pricing Approach [*Scandinavian Journal of Economics* 1976].

[79] Bacchetta & Wincoop (2006) show that heterogeneous private information explains short-medium-term exchange high volatility in relation to the long-term fundamental value.

keeps their α_j^* and α_j^e to themselves, the *current* exchange is the main source of information about whether past decisions were correct (Bacchetta & Wincoop 2006), just as *current* demand is the main source of information about the appropriateness of past decisions in the accelerator-multiplier process.). When a "critical mass" of agents expects $\hat{\rho}_j^e > \theta - \beta_j$ the run on the currency begins (Botman & Jager 2002, Flood & Garber 1984 and Obstfeld 1996). This run triggers severe depreciation if the Central Bank is unable to defend the currency. Those who stayed in pesos perceive it as a mistake and purchase dollars, accelerating the depreciation. But the Central Bank may be able to defend the currency as occasionally happens (e.g. in 1995 with the "Tequila Crisis"). Therefore, a currency attack may or may not anticipate the timing of the stability depreciation (Boinet et. al. 2005). Nonetheless, growth above its equilibrium rate depletes international reserves and eventually the threshold α^* is crossed, the severe depreciation starts and it inevitably accelerates with the currency run. Consequently, current private expenditure (including tax payments) is postponed in order to hoard foreign exchange. Thus, the recessive devaluation discussed above accelerates due to a twofold effect. First because of the premium $\hat{\rho}_j^e > \theta - \beta_j$ for postponing current expenditure and hoarding foreign exchange that enhances capital outflow H. Second, because H implies an additional demand for foreign exchange that raises ρ even further, re-enforcing demand for dollars. This process of currency depreciation and capital flight feeding each other stops when $\hat{\rho}_j^e < \theta - \beta_j$.

To illustrate this assume that capital flight behaves in sympathy with private-non-banking capital flows that are recorded in the balance of payments since 1988, and observe in **Figure 4.11** its correlation with GDP. In the 1988:2Q-1990:2Q recession, the capital outflow accompanied the depreciation (**Figure 4.3**). In the 1995 ('Tequila') and the 1999 ('Russia') recessions, the Central Bank managed to sustain the currency's value although a correlation between the fast deceleration of capital inflow and the drop in GDP began to take form. Finally, the severe devaluation of 2002:1Q was fully anticipated and a massive capital outflow produced a recession in 2001 that deepened with such devaluation.



With experience, agents increase the speed of response/adjustment to large exchange rate variations. Thus the time lag between the accelerations in the exchange rate variations and those in GDP shortened through time (**Figure 4.3**) to disappear in 2001-2002 when the depreciation was anticipated.

3.4. The floor and the recovery

In Kalecki's (1935) closed economy the recession's floor is set when agents with liquidity face sufficiently attractive asset prices (high expected profitability). In our case, the recession produces enough dollars for both residents and the Central Bank that accumulates sufficient reserves above α* to defend the currency. The end of the depreciation sets the cycle's floor when $\hat{\rho}_j^e < \theta - \beta_j$ (32) because low domestic prices induce the resumption of the expenditure postponed during the depreciation[80]. The corresponding dishoarding of dollars (H<0) feeds further reserve accumulation and currency appreciation and the expansion begins with idle capacity mostly in the domestic sector. Such capital inflow accelerates (H''<0) as agents perceive that the appreciation reduces their net earnings and this accelerates both the appreciation and the recovery (**Figures 4.3 and 4.11**). The high income elasticity of domestic demand for manufactures

[80] If high uncertainty generates self-fulfilling expectations that raise the central bank's threshold α* and/or in the country's risk embodied in θ, the recession would be deeper than otherwise.

and residential construction relative to food boosts domestic manufacturing demand[81] and employment. With the drop in inventories and the fall in idle capacity, domestic investment picks up. The GDP grows pulled by domestic absorption and crosses its equilibrium until the balance of payments is once again in deficit and a new depreciation occurs.

4. The cycle and the trend

The connections between the cycle, the trend and the potential equilibrium path are always complex; let us here discuss a few of them.

4.1 Debt, volatility, capital flight and trend

Consider the following facts. The foreign debt to GDP ratio rose from a 12% average in 1953-1974 to above 100% in 2004 (see **Figure 4.12**) just before an unilateral debt reduction of almost 30% in 2005. Argentina defaulted in 1982 and in 2002. Throughout 1953-2004, except in periods of default, there was no fiscal surplus net of debt servicing. In 1999 according to the Ministry of Economy the stock of private flight capital was equivalent to the foreign public debt.

The recessions can be postponed with a rise in government expenditure matched with foreign indebtedness to prevent devaluation[82], but the stability depreciation is deeper when it occurs[83] (29'). The corresponding debt service reduces long-term net imports depressing the actual trend below its potential equilibrium path (20.1). In addition, the tax pressure to

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[81] De Gregorio et al. (2004) estimate a rapid increase in manufactures consumption at the end of each strong depreciation in Argentina and several other peripheral economies with chronic exchange instability. In Argentina, with the recovery starting in 2002:III residential construction peaked at 76.1% of total gross fixed capital formation in that quarter. During 1993-2005 it represented 29.7% on average. according to Instituto Nacional de Estadísticas y Censos (INDEC) of Argentina

[82] The alternative of letting the devaluation occur and of attempting to avoid the recession with public deficits increased the strong inflationary pressure of the devaluation (Olivera 1964) and produced recession nevertheless (Heymann & Sanguinetti 1994).

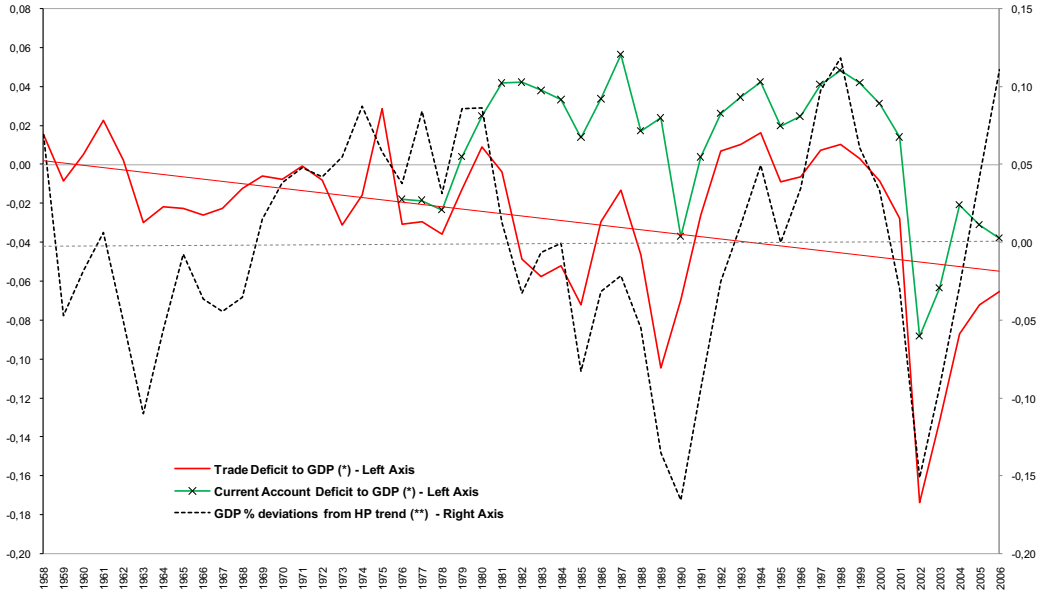
[83] Wijnbergen (1991) discusses how fiscal imbalances translate into balance of payments crises and inflation. Cumby & Wijnbergen (1989) discuss the devaluationary consequences of inconsistent monetary policies in Argentina in 1978-81.

service the debt feeds capital flight (Calvo 2003 and Tornell & Velasco 1992) and the actual trend further declines.

Figure 4.12 : Argentina's Public Foreign Debt to GDP Ratio and Unemployment Rate

The correlation between the cycle and the trade account is illustrated in **Figure 4.13** where GDP has been de-trended with a Hodrick-Prescott filter. The trend to larger trade surpluses indicates debt accumulation.

Figure 4.13: Argentina's Cycle and the Trade and Current Account Deficits to GDP Ratios - Annual Data



Sources : GDP and Trade Balance for 1958-79 from Central Bank of Argentina, for 1980-2004 from Ministry of Economy of Argentina; Free Market Exchange Rate: 1958-97 from Boletin Informativo Techint; period 1998-2004 from Central Bank of Argentina. Curent Account balance from the International Financial Statistics IMF (no data prior 1976).
(*) Trade and Current Account data in US$, as a denominator in the corresponding ratios nominal GDP in AR$ was converted to US$ at the nominal free market exchange rate.
(**) GDP in constant 1993 AR$ was de-trended with a Hodrick-Prescott Filter (lambda 1600)

If the foreign debt θD exceeds the threshold $(\varepsilon_{\rho,x}-\varepsilon_{\rho,m})X$ during the stability depreciation in (29') the price adjustment is insufficient and the recessive adjustment must fulfil $\hat{Y} < [\hat{X}^{d} - (\theta D+dH)/X] / \varepsilon_{y,m}$. If such stability depreciation-recession is too deep the economy may get trapped in a vicious circle of over-adjustment that disrupts its repayment capacity. The result would be an adjustment in the value of stocks (default) including a reduction in θD that, in combination with the recessive currency depreciation, enable foreign reserves to reach its threshold α^{*}. Consequently, the currency depreciation stops and the recovery starts as described above. The debt reduction feeds the recovery but its long-term net effect on the growth trend would depend on the extent to which the default of legal contracts throughout the economy affects institutional quality.

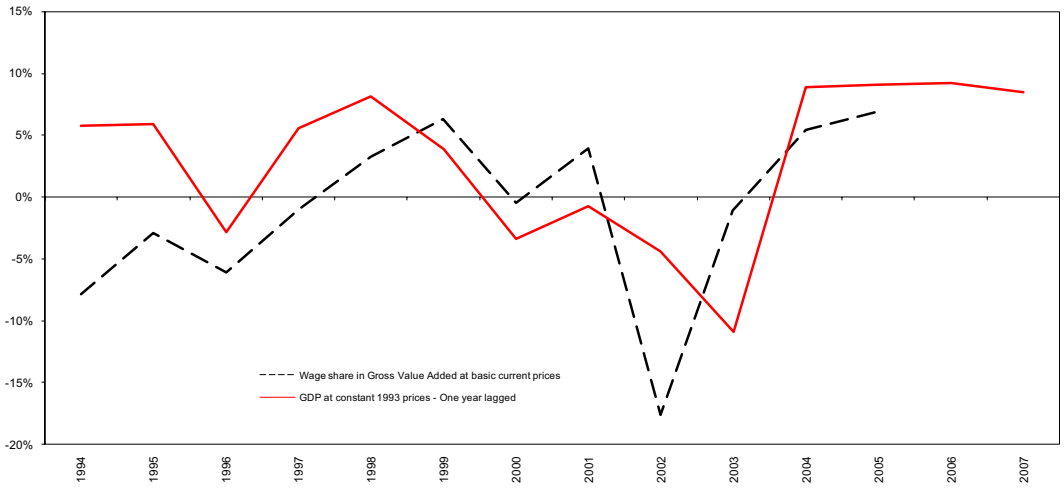
The large exchange rate volatility σ(ρ) would, on its own, increase the investment discount rate θ inducing additional capital flight and a decline in growth trend below its equilibrium path.

4.2 Income distribution, institutional quality and trend

With the recessive depreciation, domestic food prices increase and real wages ω_2 fall (7''). As structural unemployment increases with the cycle's fluctuations and further aggravates with foreign indebtedness and the slowdown in the growth path[84] (see **Figure 4.12**), real wages may not entirely recover by the start of the following currency depreciation and the wage share in national income ($\omega_1+\omega_2$) would decline. **Figure 4.14** shows the correlation between variations in GDP and variations in the wage share in national income with a one year lag for 1994-2005 (there is no data prior to 1994).

[84] Unemployment at the cycle's peaks rose from 4% between 1963 and 1989 to 12% between 1990 and 2006.

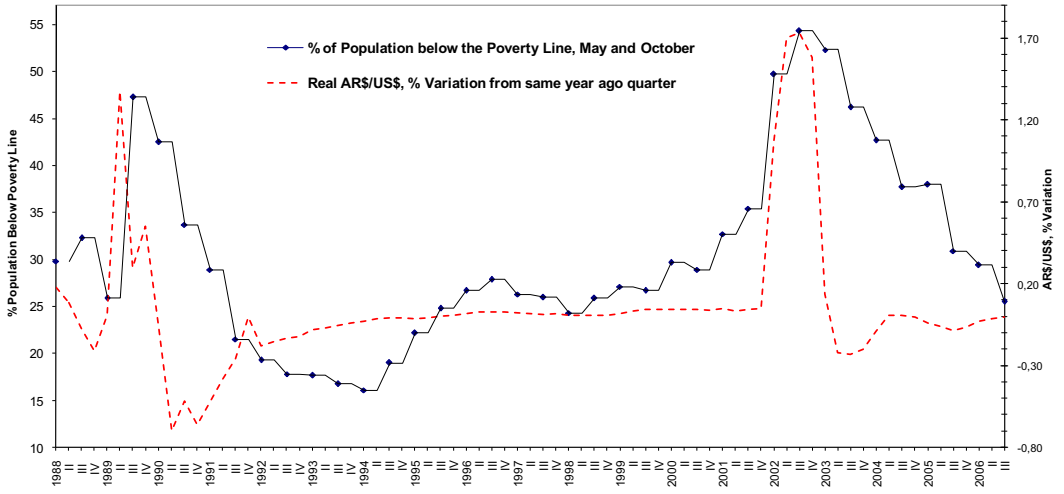
Figure 4.14: Argentina's Wage Share in GDP and One Year Lagged GDP - Rates of Change 1994-2004



Source : Wage share data from Ministry of Economy, Dirección Nacional de Cuentas Nacionales http://www.mecon.gov.ar/secpro/dir_cn/ingreso.htm Chart 1. Gross Value Added at basic current prices is equal to GDP at current prices less value added tax and taxes on imports and exports. GDP data from Ministry of Economy, Instituto Nacional de Estadística y Censos (INDEC)

Poverty data captures both the rise in unemployment and the fall in wages. **Figure 4.15** shows the remarkable correlation between poverty and the severe currency depreciation[85] of 1988 and of 2002 (there is no data prior to 1988).

Figure 4.15 : Exchange Rate and Population in Poverty, 1988-2006



Source: People living below the poverty line in Buenos Aires and Great Buenos Aires, "Encuesta Permanente de Hogares" www.indec.gov.ar, see Appendix I, Table A.14

[85] No data prior 1988

The distributive conflict resulting from such regressive distribution of income feeds relative prices' variability[86] producing further uncertainty, which affects institutional quality for it reduces the agents' possibilities of both hedging risks with legal contracts and of carrying out the surveillance of public expenditure (Ades & Di Tella 1999 and Braun & Di Tella 2004).

Such distributive conflict emerges because a very different set of relative prices and economic policies corresponds to each of the two equilibrium exchange rates ψ_2 y ψ_1. Agents align accordingly. Thus, whatever the exchange rate market value is, conflict is likely to emerge. The great variety of policies in 1953-2004 suggests that no permanent consensus was reached. This policy instability led to a further deterioration of institutional quality and growth trend below its potential equilibrium path (20.1) fuelling structural unemployment

4.3 Industrialisation, exports and trend stability

The rise in $X/Y \approx I_x/I_d$ through 1953-2004 (see **Figure 4.9**) may have had a stabilising effect since I_x does not accelerate the fluctuations in Y as I_d does. Moreover, the rise in the share of manufacturing exports of industrial origin[87] $(1\text{-}x_1)$ illustrated in **Figure 4.7** should have reduced the exchange rate duality captured in $x_1(\psi_2 - \psi_1)$ (24) and also in $\lambda(x_1)$ $(\psi_2 - \psi_1)$ (7.1) and the uncertainty associated with such duality.

5. Policy implications

Assuming that no adverse changes in world demand, prices or interest rates occur, a policy to stabilise the long-term expected exchange rate at a 'social value' in which manufactured exports grow at the high world demand rate would require:

a) fiscal surpluses sterilising current account surpluses enabling the Central Bank to accumulate sufficient reserves to prevent currency depreciation;

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[86] Given the downward rigidity in nominal prices, relative prices' variability generates inflation (Olivera 1964)

[87] A rise in X/Y with a constant x_1, would have to differentiate between export investment in food and in manufacturing as a function of their respective world price volatilities.

b) rising fiscal surpluses to sterilise rising capital inflows attracted by increasingly large reserve stocks, to prevent currency appreciation to its high (measured in dollars) agricultural equilibrium value;

c) agents expecting the above to be permanent

Fierce political resistance in the past to low and high targeted exchange rates, highlights the difficulties facing such policy.

6. Conclusions to Chapter 4

Argentina's manufacturing exports demand grows faster than food exports demand, and the land rent share in national income tends to decline while investment in the production of manufactured exports tends to increase. This tends to reduce the destabilising effect of the dual equilibrium exchange rates. Therefore, pulled by external demand the economy's equilibrium growth rate would tend gradually to rise and stabilise. The evidence indicates that this is a remarkably slow process subject to cyclical setbacks because export investment does not respond to the currency depreciation occurring at the cycle's peak and the rise in undemanded savings triggers the recession. Such sluggishness in export investment occurs because entrepreneurs discount that the depreciated currency will rise to an uncertain value as agriculture oversupplies foreign exchange. The recovery is led not by exports but by domestic absorption as domestic assets become attractive with the expected appreciation at the end of the depreciation. Domestic investment accelerates GDP fluctuations pulled by the high price elasticity and the high income elasticity of demand for domestic manufactures relative to the corresponding elasticities of domestic demand for tradeable wage goods. The resulting cyclical instability incites conflict over the distribution of income, harms institutional quality and depresses growth below its equilibrium possibilities. A policy of stabilising the exchange rate would facilitate growth, but the erratic policies of floating and fixed (low and high) exchange rate regimes in 1953-2004 highlight the difficulties in economic policy making. If our analysis is correct, in addition to the usual consistency recommendations a sensible policy would have to take the particulars of Argentina's dual equilibrium also into account.