**DEVALUATION, PRIMARY EXPORTS
AND WAGES IN ARGENTINA:
AN UNORTHODOX INTERPRETATION**

Daniel Kostzer
December 1990

Daniel Kostzer was a participant in the MA Programme (Agricultural and Rural Development) at the Institute of Social Studies, 1989/1990.

This paper was submitted in partial fulfilment of the requirements for the Degree of Master of Arts in Development Studies of the Institute of Social Studies.

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Introduction

The present study tries to analyze, with a *non-orthodox* approach, the role of the real exchange rate on the export performance of the agricultural sector of Argentina and the variables, endogenous and exogenous, that affect it.

This objective will be achieved through the development of a model that describes, in a simplified way, the behavior of the sector, and attempts to forecast to certain extent, reactions according to the fluctuations of each variable. The model differs from that traditionally used in the role that wages play as the deflator of the exchange rate, showing a somehow *Ricardian* conflict between the interests of the agro-export producers and the rest of the economy.

In this exercise we also try to call attention, (and this is not the first one to do so fortunately), to the negative social effects of the neo-orthodox *recipe* of IMF and World Bank supported *Structural Adjustment Programmes*, which foresee devaluation as an effective and efficient instrument to restore external and domestic balance. In the study we find that in order to increase export volumes through devaluation, large devaluations are required with very deep falls in real wages and at extraordinary social costs, as will be analyzed in this paper.

Relevance of the Study

Since the beginning of the century there has been developing a strong debate between two economic points of view, each with different perspectives on the patterns of development for Argentina. This debate goes beyond the merely academic debate, to have influence on the power structures of the country, conditioning the action of governments frequently. This debate is also present within the political parties and emerges with every economic decision of governments.

One of these groups, which have been called *ruralists*, argues, from the stand-point of *comparative advantages*, in favour of an economic

strategy which is centered around primary exports, a high exchange rate, better infrastructure (e.g. harbors, silos, railroads and roads), and elimination of export taxes as incentives to the production of exportables and generate an important flow of foreign currency.

The second group, that we will call *industrialists*, focus on the development on the secondary sector and pushes for *cheap food* for workers, subsidized imports through a low exchange rate and the promotion of exports through direct incentives.[1]

This debate reached a peak during the 50s' and early 60s' when the *Import Substitution Industrialization* (ISI) strategy was seen as a must. Later, since the debt crisis and until now, become boosted because for the need of foreign exchange in order to confront the servicing of the external debt and the need for surplus to invest in the country.

Although this debate is wide-spread in Latin America and LDC's in general, in Argentina it has a special meaning due the particular characteristic of the country. The industrial sector is mainly domestically oriented and represents, with the complementary services, an important share of the economy, while agriculture account for around 15% of the GDP, but 70% of total exports. Another feature of Argentinean exports is that grains, flour, oils and beef are also the main *wage goods* or staple food of the population.

Here there is a serious conflict between the interests of these two groups, especially with the wage earners that within this framework are on the side of the *industrialists*, since the latter orient their production to the domestic market, depending on real wages, and they want lower food prices in order to grab a higher part of wage earner's income. The *ruralist* want higher prices for their production, always above the world market price, otherwise they will prefer to export.

The model developed in this study shows the mechanism underlying this contradiction.

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[1] A typical incentive for industrial exports are refunds of percentages of their total FOB value.

Argentinean Agriculture

The Argentinean agricultural sector is divided into two very clear geographical areas that have a definitive relation with the destination of the production. One area called the *pampean* region, produces the bulk of grain and beef. It is famous for its rich soils, that permits and extensive production with very low comparative costs[2] and a small amount of working force.

The *non-pampean* region is the one dedicated to production for the domestic market, producing sugar, fruits, vegetables, yerba, tobacco, grapes and wine, etc. These activities are generally labour intensive and the mode of production is characterized by a coexistence of very large and very small farm units, i.e. the so called *latifundio* and *minifundio* complex, referring to the coexistence of very large plots with small ones that can not constitute an economic unity[3].

There are large productivity differentials between these regions. While the *pampean* region accounts for the 25% of the country's cultivated area, it produces 65% of the agricultural GDP. Around 48% of the rural economically active population works there. In 1988, 76% of the national agricultural gross value added came from the pampean region. Only 17% of the gross value added of the pampean output is constituted by wages, and 73% of the national high income farmers live in one of the 5 provinces of the region. Only 8% of the total low income farmers reside in the pampas.[4]

These facts help us to understand the big disparity between both regions that is reflected in the interests and aims of the policies. The conventional promotion of traditional exports tends to deepen these disparities, mainly due to the fact that the products that can be efficiently produced in the *pampean* region cannot be done outside it

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[2] According the World Bank [1989, pp. 186] It is '... *roughly two-thirds to one-half the production costs in the United States*'.

[3] There are several authors who studied this interaction in Latin America, but in summary we can say that the *latifundios* refers to big plots that produce with the labour provided by the *minifundios*, avoiding permanent relations with the workers, maintaining temporary basis with lower wages and no social security.

[4] Data from: Giberti [1988], Regunaga [1988], Barsky and Bocco [1988].

because of agro-ecological factors, and the chances of competing with non-temperate climate products against tropical countries is remote.

Exports, Prices and Wages

Today it is heavily argued that the *dollarization*[5] of the Argentinean economy is a fact. The domestic prices reflect the variations of the exchange rate, especially in periods of devaluation. This process is clear especially since 1975-76, when is possible to argue that the *adjustment program* began. It coincides with a *Fund Supported Programme*, a big general strike of the strong CGT[6], and the beginning of the ferocious repression against revolutionary movements and other forms of social organizations, that ended with the military government in 1976.[7]

The message of the omnipotent Minister of Economy, Jose Alfredo Martinez de Hoz[8] was that the only way of developing the country was through redesignating the productive profile of Argentina. This was attempted by trying to gain new markets with an industrial transformation towards new products, more efficiency and with no other incentives than the ones provided by the markets and by improving the traditional export activities.

The first measure was to erode the purchasing power of wages, stopping indexation during the end of 1975 and the first months of 1976[9], which implied a sharp fall in real wages. This phenomena is clear in the following graph 1 where exchange rates deflated with different indexes

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[5] *Dollarization* in this context means that local currency, due instability and fluctuations, lost its function as unit of measure, which the dollar become notead. Although transactions are still being performed in australes, goods and services are measured in dollars.

[6] This is the unique workers' central, of Peronist orientation that for first time decided to strike against the peronist government.

[7] Not to link the economic program and the political repression during the 70's could be from naive to dishonest.

[8] He is the grandson of the founder of the Sociedad Rural Argentina, the association which gather the big land-lords of Argentina, and become a parallel power in the country.

[9] From November of 1975, when the *coup de etat* was foreseen, to June of 1976 the inflation rate was 280%. The total for the 12 months of 1976 was over 300%.

are compared. The one which has a different behavior, and which dramatically changed since 1975 is that deflated by average urban wages. The other ones have the same shape among themselves.

Real Exchange Rate
With Different Deflators

Index Base: Avg 1968:1988=100

Graph 1
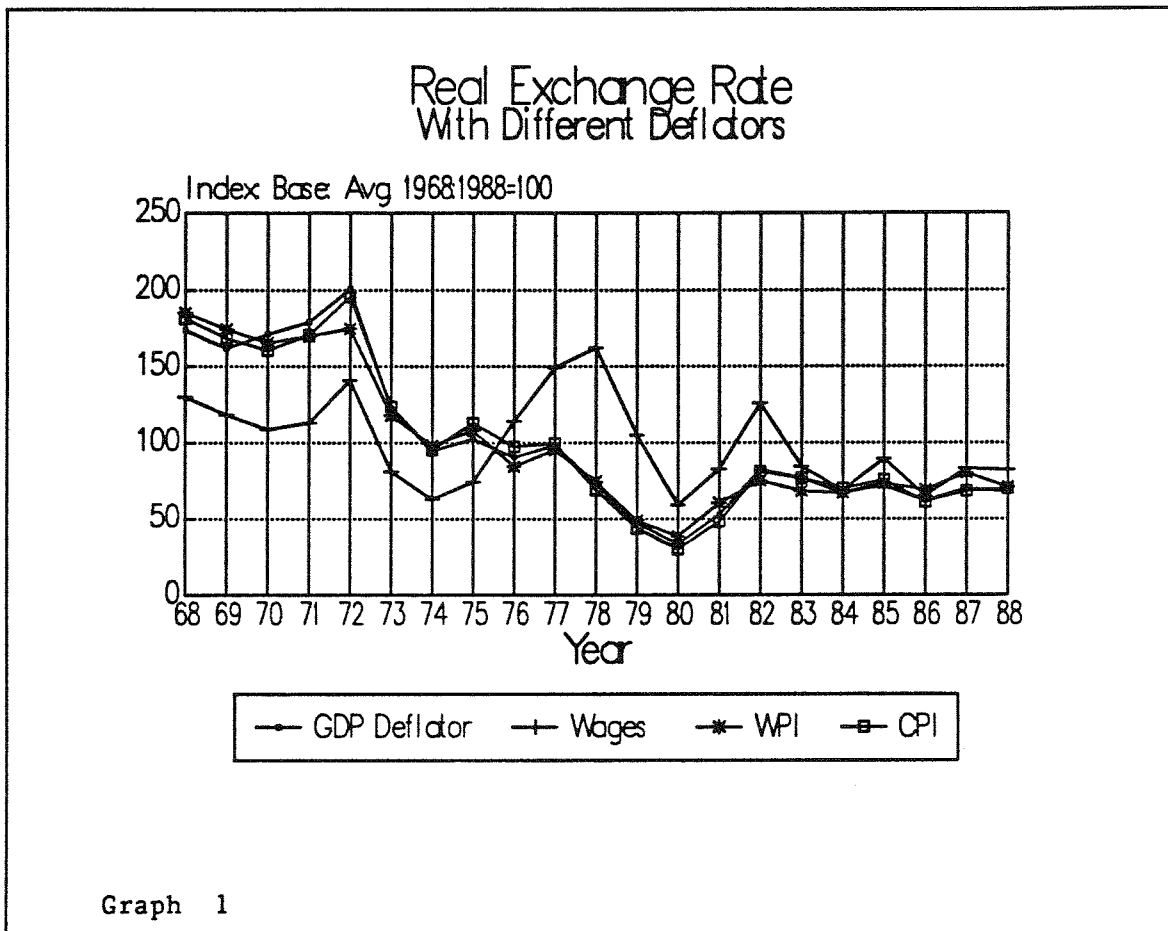
Observing primary exports' sharp increase during 1975-1977 we cannot explain it through the evolution of the real exchange rate according to conventional deflators such as the consumer price index, GDP deflator or wholesale price index. Obviously we would expect an increase of exports in the presence of appreciation, and this is not the case. The appreciation of the real exchange rate deflated with wages is that which moves together with increments of the quantity exported.

The graph also suggests the erosion of the purchasing power of wages in Argentina despite the powerful organized working movement of the

country. The explanation is that the military repression supported the new economic program[10].

Agriculture also shows a dramatic change, but not on the side of production. According to De Janvry[11] et. al. [1989] and FAO Yearbooks [several years], the food production of Argentina has been growing slowly during the period under study, while exports show a sharp increase during 1975 to 1977, and a more or less steady increase thereafter.
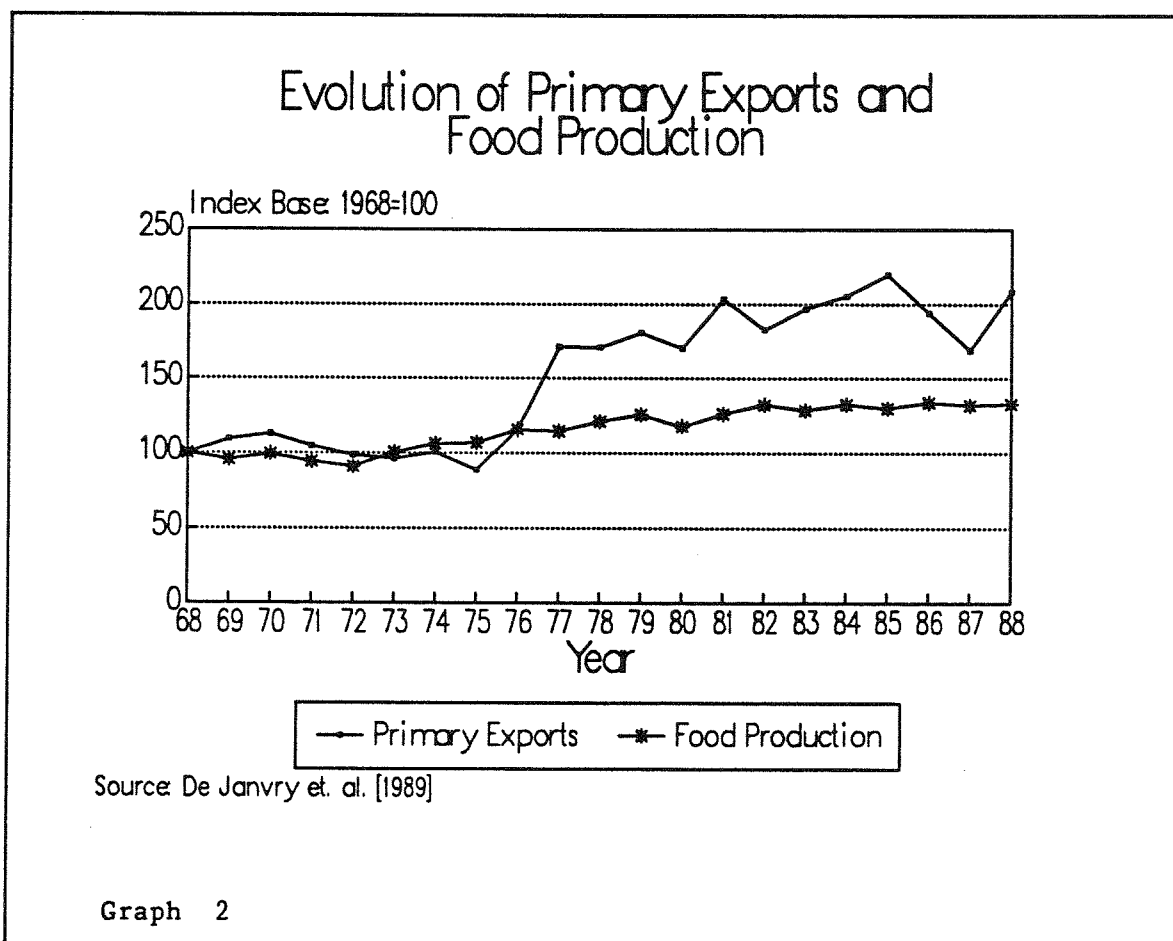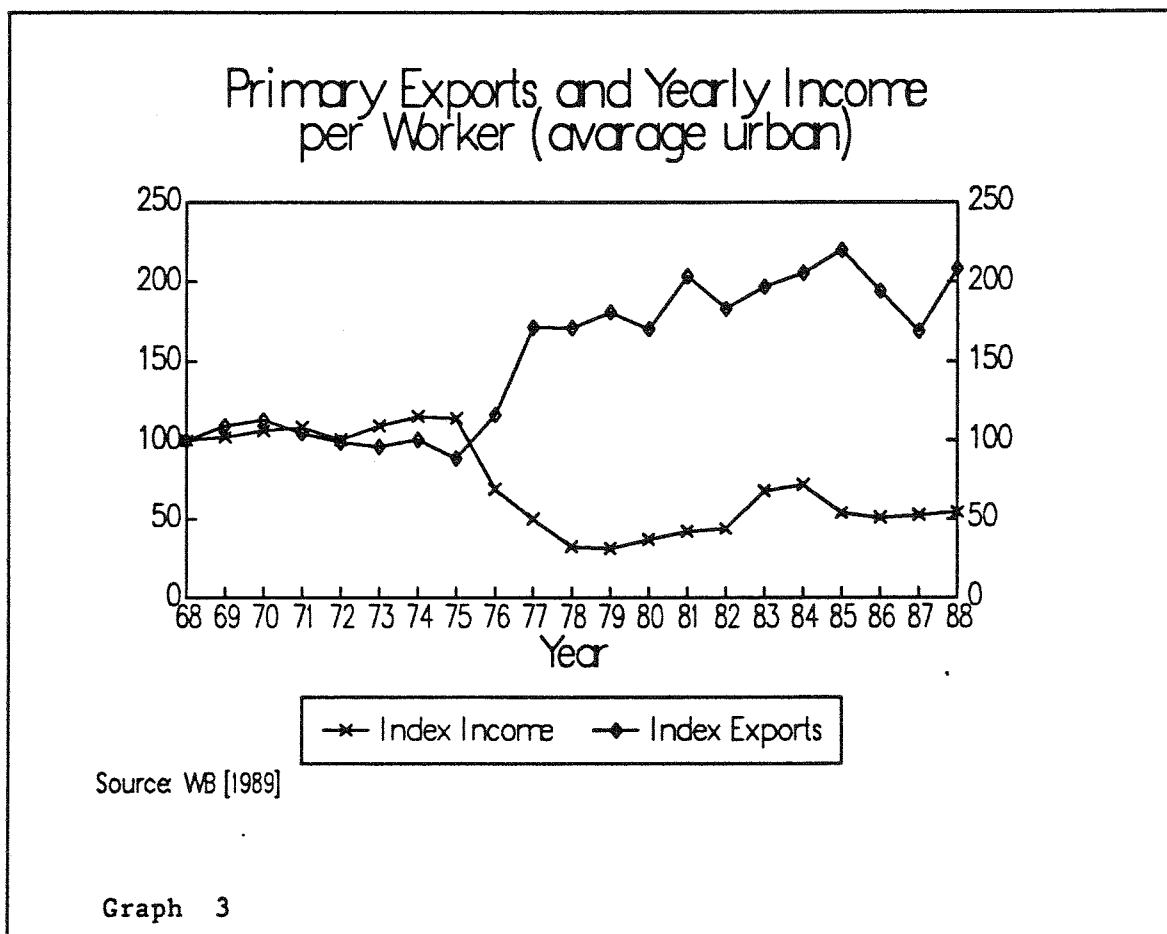

Graph 2

The graph above (2) shows these trends. It is true that the incorporation of soya as one major export helped increase the production

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[10] In several parts of this paper I state that the only way that was possible was by the terror regime installed in Argentina during the years of the military dictatorship that had their pinnacle in the forced disappearance of people that the Madres de Plaza de Mayo still claim every Thursday in their march around the square in front of the government house.

[11] De Janvry, Alain, Elisabeth Sadoulet and Carlos Benito [1989] The Debt Crisis and Latin American Agriculture: Perspectives on Rural Development. mimeo.

sold abroad, but this process implies a displacement of other crops, mainly those for domestic consumption[12]. Also of some significance is the fact that grains have been growing at a yearly rate of 4.2% and oils at a rate of 9.5% during this period. The production destined to the domestic market is the one that compensates with its slump the slight increase on food production. If production maintains a steady path and exports have a sharp increase upward, this implies, by definition, that the consumption fell.

Primary Exports and Yearly Income per Worker (avarage urban)

Source: WB [1989]

Graph 3

Graph 3 presents the divergence between the index of primary exports and the average yearly income of an urban worker[13]. It depicts

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[12] The increase in exports during 1975-1977 is not reflected in the trend of food production, that includes exportables. It is argued by several authors [e.g. Cortez, 1981; Marshall and Cortez, 1985] that the incorporation of soya and other oilseeds and the reduction of beef, in the composition of exports implies a deliking of exports and wages.

[13] According the ECLA calculations and transformed to a 1968 base to see the trend in the overall period.

the fall in yearly income since 1975 until 1978, the slight recovery of 1983 and the fall and stagnation of 1985-88.[14]
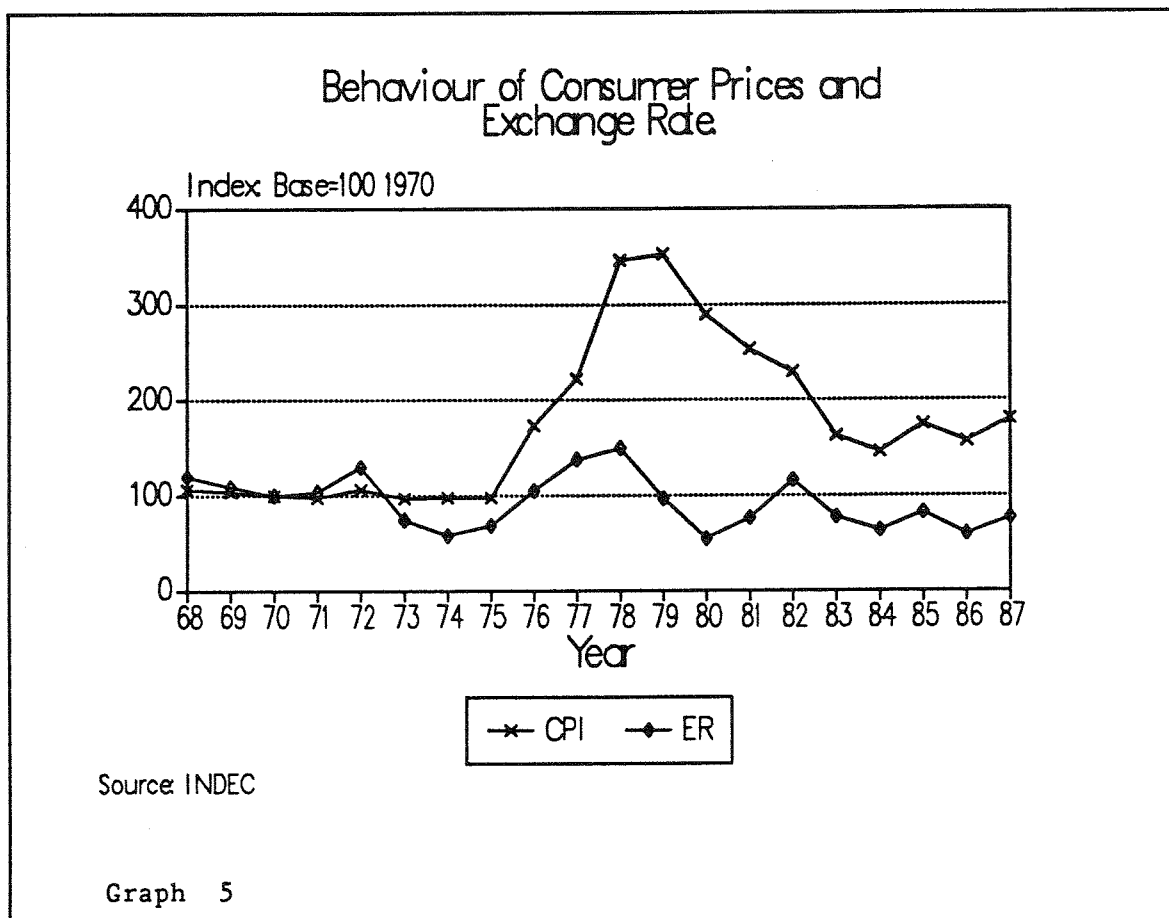
Graph 4 shows the correlation between domestic price movements and real exchange rate fluctuations. There is a similar pattern between agricultural and non-agricultural prices. When compared with the exchange rate, we find since 1981 a similarity with it. All of them are deflated by the wages mentioned above.

Behaviour of Domestic Prices and Exchange Rate

Index Base=100 1970

Source: INDEC

Graph 4
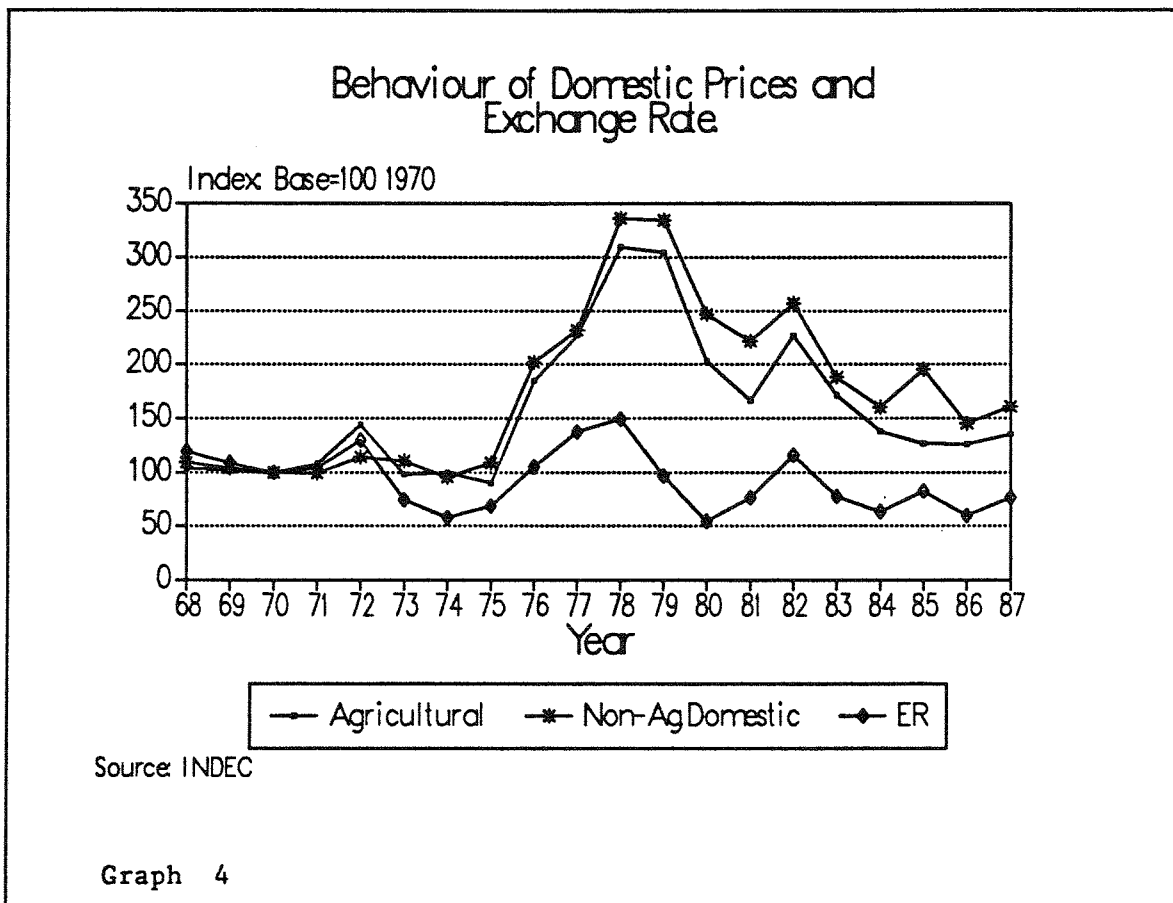
The interest thing in this is that dollarization clearly works when there is devaluations (e.g. 1975-1978, 1982, 1985 or 1987), but in the cases of revaluation (1979-1980), it does not work with the same intensity. This highlights something that should be analyzed in some detail in other studies concerning the rationality of firms in Argentina, that *index* their prices to input cost, (due oligopolistic

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[14] The year 1984 is when the new democratic government took office with the advise of Raul Presbich, which promoted economic recovery through the development of the potential domestic market via wage increases. This idea lasted little more than one and a half years when, in June 1985 the *Austral Plan* was implemented to combat inflation.

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conditions of the economy), with the highest index e.g. dollar, interest rate, etc.[15]

Behaviour of Consumer Prices and Exchange Rate

Index Base=100 1970

Source: INDEC

Graph 5

Graph 5, above, shows that the relation between the consumer price index and exchange rate is similar to that pointed out before. Between 1975 and 1982 there is an erratic correlation; since them until now, there is a direct relationship between both indicators. This helps to understand further considerations concerning wealth effects and the social costs of devaluation.

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[15] The markup is maintained fixed as long as inputs cost varies e.g. devaluation, wage increase, etc., passing on those increments to the price. In the case of interest rate variations, those fluctuations operate in a dual way: as a *financial cost* and as *an opportunity cost being a floor* to the markup, increasing it according to the monopoly power of the firm in the market.

Agricultural Exports

As was mentioned earlier, primary exports constitute 70% of the total exports of Argentina. Grains are the main part, accounting for 50% of total exports [Regunaga, 1988][16].

According to the International Wheat Council, in their *Market Report* of 1987, Argentina has a share of between 5 and 9% of the world market of wheat and flour; around the same in oils, and somewhat more in coarse grains. Beef has been loosing importance due to the lowering of the purchasing power of some of the traditional LDC buyers and the restrictions to sell to the EC due to protective policies and subsidies.

The commercialization of Argentinean primary exports is through a dozen big brokers, three of them cooperatives, the rest multinational firms, some of Argentinean origin. *'Six large transnational companies exported 57% of the wheat, while three cooperatives accounted for 23% and the remaining 20% was divided up among 21 firms'*. [Giberti, 1988: pp. 78].

Argentinean exports change hands several times before reaching their final destination. Some of these operations are within branches of the same corporations that export, to increase profits. Sometimes, when there is an important discrepancy between official and parallel exchange rates, operations for under-invoicing or under-reporting are performed, declaring less exports than really occurred in term of tons or declaring a lower price than that really paid.

The government pre-finances exports by giving credit as off 270 days before the harvest. This is supposed to avoid financial dependency by the producers, but in reality the pre-financing goes to inscribed exporters, independent of the fact whithin they are producers or not. This gives some extra power to those big corporations that manage the bulk of the export market. At the same time some of these firms are related to the domestic market, producing flour, oils and other by

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[16] Regunaga, Marcelo [1988] *The Competitiveness of Argentine Grain Production in the World Market*. in The Argentine Agricultural Economy. Asociacion Argentina de Economia Agraria. Buenos Aires.

products or by selling seeds, fertilizer and inputs to producers or providing services (e.g. insurance, transport or credit).

Argentinean producers have had easy access to the world market, even during unfavorable periods. Regunaga [1988: pp. 202] argues that this is due to: ' *a) competitiveness because of comparative advantages; b) the lack of rigid internal policies of price support or reserve stocks; c) adjustments in the net exchange rate for exports'*.

Explaining further the factors outlined above, we can say that point (b) is very important in terms of the *exportable surplus* because governments never conditioned the sale abroad under any circumpstance[17]. The other important factor (c) is that governments adjusted the net exchange rate, via export taxes in order to maintain a certain level of profits. This was more related to the domestic side of the economy rather than to variations in the world market. This point highlights the relevance of the international price in our model.

This background will permit us to understand the relevance of the findings of this study and the considerations, economic and political, that it highlights.

The Study

The study consists of two main parts, this first is theoretical discussion concerning exchange rates, exchange rate fluctuations and more specifically devaluations with an analysis of the two most representative economic schools (neo-orthodox and structuralist) in this discussion for the Argentinean case, that will provide the foundations for the analysis.

The second part contains the focus on the relationship between wages, exports and devaluation in Argentina, trying to describe the micro and macro rationality for the allocation of production of tradables in Argentina. Latter in this section a the model is developed

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[17] The only period was during the early 50s' when the Peronist government nationalized the external market creating an *ad-hoc* institute (IAPI), a sort of marketing board.

with an explanation of the use of each of the variables and the respective statistical analysis.

The final part of the study is the conclusion with some final remarks and policy considerations.

CHAPTER II

THEORETICAL APPROACHES TO THE EFFECTS OF EXCHANGE RATE DEVALUATION

INTRODUCTION

DEFINITION OF EXCHANGE RATE

CONCEPT OF DEVALUATION

COMPARISONS BETWEEN SCHOOLS

THE NEO-ORTHODOX POINT OF VIEW

THE STRUCTURALIST VIEW ON DEVALUATION

SUMMARY COMPARISIONS

Theoretical Approaches to the Effects of Exchange Rate Devaluations.

Introduction

In this chapter a review will be given of the literature on the effects of exchange rate fluctuations, from the points of view of the neo-orthodox and the structuralist schools. This review will serve as a theoretical background with which to analyze the model used in this study and elaborated in chapter 3.

Exchange Rate

The exchange rate is defined in terms of a relationship between the domestic and a foreign currency. The exchange rate can be defined as '...the price of a foreign currency unit in terms of domestic currency...' [Helmers, 1988][1].

Due the different way in which domestic and foreign currencies vary, there are two different types of exchange rate fluctuations: nominal and real fluctuations. The nominal exchange rate does not take into account inflation, while the real exchange rate does. The way of differentiating between the two depends on the way in which the exchange rate is deflated to give the real relation in unit terms.

A fluctuation of the exchange rate analyzed only in nominal terms, hides a big portion of reality [Wood, 1981]. There are several ways of deflating the nominal exchange rate (ER) in order to achieve the real exchange rate (RER).

One is the GDP deflator, broadly used, with the problem that it does not show clearly when consumer prices fluctuated more than the overall income or value added of the economy. This is the one used by Wood in his work on RER.

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[1] Helmers F.L.C.H. [1988] *Real Exchange Rate Indexes*, in Dornbusch, R. and L. Helmers (eds.) The Open Economy. EDI Series Oxford University Press.

$$RER = E_n / GDP_{deflator\ index}[2]$$

The Wholesales Price Index (WPI) is also very broadly used. Dornbusch [1980, 1981, 1986]; De Janvry [1987,1988,1989]; Diaz-Alejandro [1965, 1973]; and Krugman and Taylor [1979] among others use this index in several ways. One is deflating the WPI for domestic goods (WPI_d) on the WPI for imported goods (WPI_m) [Dornbusch and De Pablo, 1986] achieving the terms of trade or the relative price of domestic goods over imported or foreign goods.[3]

$$RER = (E_n / WPI_d) / (1 / WPI_m)$$

where:

$RER < E_n$ implies depreciation[4]

$RER > E_n$ implies appreciation

De Janvry uses the same index, but also deflates it by the WPI of the countries currency that manages the bulk of the trade with the one analyzed one [1987,1989]. For the Latin American countries that he deals with, the dollar area is the one used (WPI_{USA}).

$$RER = E_n \cdot (WPI_{USA} / WPI_d)$$

Helmers [1988] uses the domestic CPI and the WPI_{USA} for deflating the exchange rate:

$$RER = (E_d / CPI_d) / (1 / WPI_{USA})$$

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[2] RER is the real exchange rate, E_n is the nominal exchange rate and GDP is gross domestic product.

[3] Actually in Dornbusch and De Pablo, they use the direct relation between the WPI_d / WPI_f (Domestic/Foreign), which implies that when the RER>1 there is revaluation or RER<1 devaluation.-

[4] The difference between devaluation (revaluation) and depreciation (appreciation), is that while devaluation is any negative change of the local currency in relation to the foreign one, a depreciation is the same change but taking into account a theoretical equilibrium point.

Dornbusch [1980] also uses another RER that is the one that will be the attention of the paper, this is deflating the RER by the wages of the country (W_d) and the price index of the foreign country in which we are interested.

$$RER = W_d/(E_n*WPI_{USA})$$

This definition of RER shows the purchasing power of domestic wages in terms of a foreign currency. We will work it *upside down*: the wages are going to be the deflator of the nominal exchange rate $(RER = E_n/W_d)$.

Concept of Devaluation

Devaluation is a downward change in the value of a country's currency in relation with foreign ones (especially its trade partners). It is usually assumed that a devaluation will *'...affect the country's foreign trade and domestic economy through relative price and resource allocation effects'*. [Romero Bautista, 1980][5], and that this increases the amount of local currency needed for each unit of a foreign one.

The devaluation can be nominal or real, like any exchange rate fluctuation. The nominal one is when the increase in the quantity of local currency to acquire a unit of foreign exchange comes together with and increase in all the variables of the economy (e.g. domestic prices, wages, money in the economy, etc.). On the other hand a *real* devaluation is when there is an alteration in the relative prices of *tradable* vis-a-vis non-tradable goods. The concepts of real and nominal are key to understanding the different positions around this discussion.

## Comparisons Between Neo-Orthodox and Structuralists Approaches

Here we will compare two streams of the economic thinking that analyze the behavior of the economy under devaluation.

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[5] Bautista Romero [1980]. *Exchange Rate Adjustment Under Generalized Currency Floating: Comparative Analysis Among Developing Countries.* Staff Working Paper No. 436, October 1980. World Bank, Washington.-

For the Neo-Orthodox, exchange rate fluctuations, are a very important part of the adjustment processes of an economy. Since devaluations are supposedly needed to get *prices right*, to restore external and internal balances, for this stream of economic thinking, it is a central measure in the *Structural Adjustment Programmes* designed by the IMF and the World Bank now a days.

From the starting point of trade deficit, that reflect an excess demand for foreign produced tradables and imports, a devaluation is expected to affect the supply side of the economy, stimulating the production of tradables goods (exports and import substitutes), and on the demand side will lead to a shift in the patterns of consumption from tradables to non-tradables, or at least from imports to domestic goods.

Initial Effects of Devaluation

Local Currency

Dx' Sm'

Dx Sm

Dm

Sx

Quantity
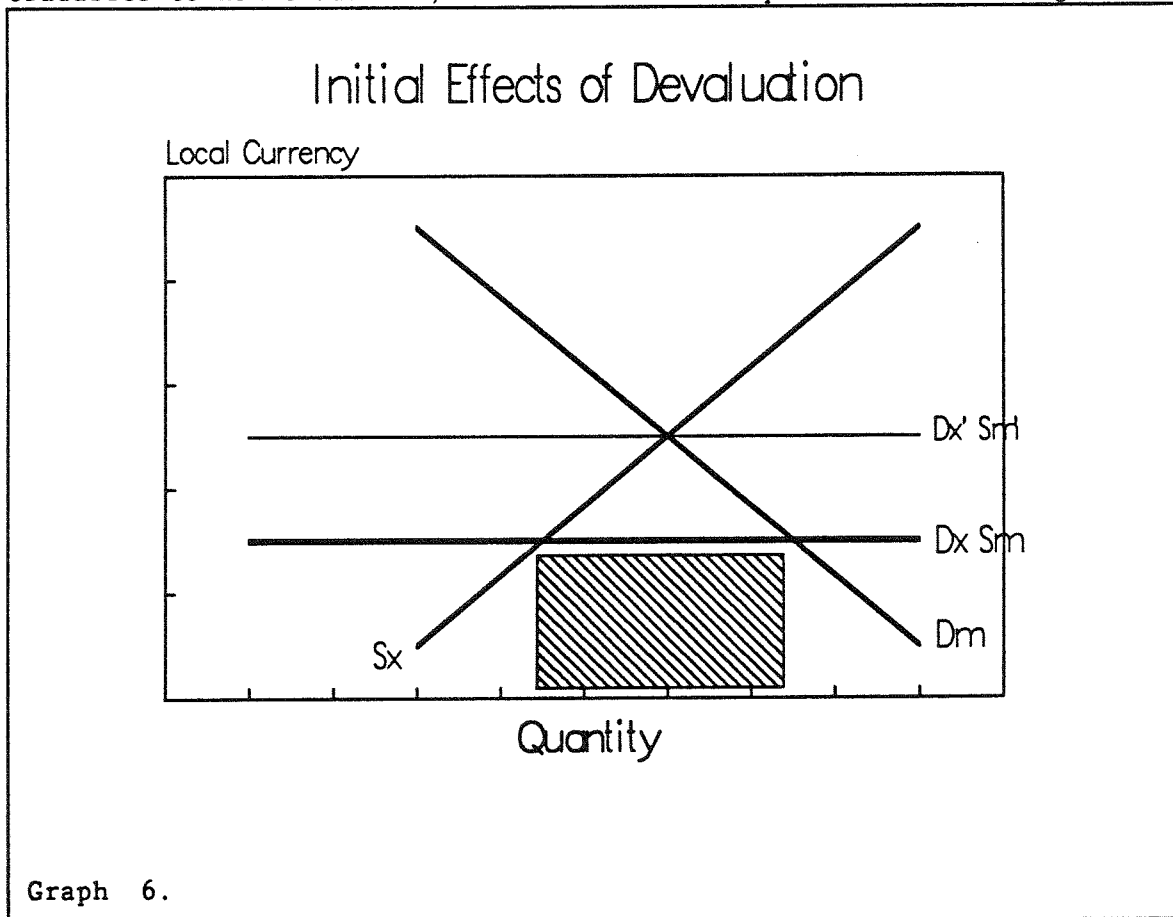
Graph 6.

Graph 6, used by Diaz-Alejandro in his Ph.D. thesis[6] shows that at the initial level of the ER, the difference between the supply of exports and demand for imports results in a deficit equal to the grey area. A devaluation will shift the Dx and Sm curve to the new point, achieving the equilibrium point, balancing the trade.

In the graph is clear that depending of the elasticity of the supply of exports (Sx) and demand for imports (Dm), the effect of a devaluation will be greater or smaller. This scheme assumes perfectly elastic supply of imports and demand of exports, one of the pre-requisites of a *small-country*, which can not modify with its production the price of exports or with its demand the price of imports.

The devaluation is also called upon to alter the relative prices of traded goods *vis-a-vis* non-traded goods. Initially this appears as a *sectorial* instrument, impacting only on the relation between the tradables and non tradables, at the initial moment.

From this point of view, devaluations are always introduced in the framework of reducing current account deficit '... *aimed at restoring a sustainable net capital inflow.'* [IMF, 1987][7] This approach, *the absorption approach*, is the one used by the IMF in the Fund-supported adjustment programs. The *absorption approach* tries to reduce domestic expenditures, either public or private, but also increase the production of tradable goods in order to maintain the potential output of the country. The second part is the *elasticity approach,* that plays with the substitution effects.

The devaluation plays a crucial role in the SAP (Structural Adjustment Programmes) because it permits the reduction of expenditures on *exportables* and diverts it to domestic goods. This effect is placed also on non-residents, whom reduce consumption of domestic goods and consume more of those that are imported from the country that applies SAP. This process is called *expenditure switching* and depend on the

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[6] Diaz-Alejandro, Carlos [1965] *Exchange Rate Devaluation in a Semi-Industrialized County: The Experience of Argentina 1955-1961*. The M.I.T. Press. Boston

[7] IMF [1987] *Theoretical Aspects of the Design of Fund Supported Adjustment Programs*. Occasional Paper 55. Washington D.C.

elasticity of the supply and demand functions. The former *expenditure reduction* what implies a reduction in the domestic absorption.

According to the IMF (*op. cit.*) '... *a devaluation of the exchange rate entails a rise in the incentives to produce goods for export or competing with imports and a fall in incentives to produce goods that are not currently or potentially traded across borders'*. The dynamic of this process operates through the alteration of incentives to local producers, who are going to shift from the long term supply function for tradables, inelastic given the capital labour and inputs, to a new one, in the short run more elastic, increasing the output of exports and import substitutes with the consequent rise in the export level and decrease of imports. This effect will continue until the rest of the economic variables -wages, raw materials and other input costs, as well as the prices of non-traded goods- return to the *initial point of equilibrium*.

For the neo-orthodox, the equilibrium is one, and the *stimulating* effects of a devaluation will last longer if the adjustment of the other variables is slower.

At this point there is a crucial fact on which lies most of the SAP: the elasticities of supply and demand, both of tradables and non tradables. The neo-orthodox literature discusses in depth the elasticities, the factor that can define feasible or not a devaluation. The classic *Marshall-Lerner condition* points out that a devaluation would reduce the trade deficit if the sum of the elasticities of demand for imports and exports is greater than one. If the elasticity supply of the schedule for exports of a devaluating country is zero, devaluation can not worsen the trade balance, but it will not improve unless there is an almost infinite elastic demand for imports.

Other Neo-Orthodox Considerations

There are several conditions and constraints to devaluations ᵒin order to achieve the results that these authors expect. The first one was already pointed out and is the case of the elasticities.

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Edwards [1982][8] considers the first thing to look at before implementing a devaluation and what could give a clue to the future effect of it is whether relative prices are out of line or not. Beginning with the concept of the real exchange rate as a '... *measure of the degree of competitiveness of domestically produced tradables'*, and a stagnated economy (like many LDC's countries during the 1980s with no technological change) Edwards [1988, 1989][9] also points to a possible trade-off between wage indexation and devaluation, claiming that the recovery of the purchasing power in terms of tradables, will offset the effects of the devaluation. *'Wage indexation has a negative effect in that devaluation and would partially offset by an increase in price of non-tradables through the wage indexation clause. ... wage indexation should be abolished'*. He points to the supply side of tradables, on the costs of production, and the demand, due to the purchasing power of domestic wages, which assuming that an increase in the exchange rate, will lead to an increase of overall prices. If there is the chance of indexation, this will return things to the starting conditions.

The latter statement is widely supported by the neo-orthodox. For more references see Dornbusch [1980, 1981, 1985, 1988]; Blejer [1982], Dagnino Pastore [1982], and Corbo [1982, 1983, 1985, 1987].

The Structuralist View of Devaluations

From the Structuralist perspective, the first critique of the Neoclassical approach to devaluation refers to the rigidities that the LDC's economies have, due to institutional characteristics, resisting the dynamic stated before. It has been argued that '...markets may show rigidities and perverse responses to price signals for reasons of different institutional behavior, market power, imperfect information and class interests; (...) ...developing country exports are highly vulnerable to technological or institutional changes in the economies of the industrialized nations, while imports are linked by technical

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[8] Edwards, S. [1982] in Barletta, Blejer and Landau (eds.) *Economic Liberalization and Stabilization Policies in Argentina, Chile and Uruguay.* A World Bank Symposium, Washington D.C.

[9] Edwards, Sebastian [1988] *Real Exchange Rates, Devaluation and Adjustment: Exchange Rate Policy in Developing Countries.* M.I.T. Press, Cambridge, Massachusetts.

coefficient to domestic production and accumulation'. [FitzGerald and Vos, 1989][10]

Structuralists and Devaluation

As said, there has been a long history of structuralist critique to the orthodox approach to devaluations. Since CEPAL over many years the economists of this school have been criticizing the *elasticity approach* being called *elasticity pessimists*. Several economists started since early 1949 [Hirschman] to write about the regressive income effects of devaluation, i.e. implying an income transfer to the rest of the world.

Diaz-Alejandro [1965] showed that in the case of Argentina, during the early 60's, devaluations lead to a reduction of real income of workers with a fixed nominal wage, while that of capitalist or non-wage earners, increased, since the latter was assumed to have a higher propensity to save. A devaluation will consequently depress consumption and lower the domestic absorption if not all the trade-surplus is invested.

In the same line, but addressing different factors, Krugman and Taylor [1978], Taylor [1983], Solimano [1986], Arida and Bacha [1984], Van Wijnbergen [1986], Buffie [1983], Easterly [1984] Bardone [1984], Arida [1986] pointed at possible recessionary effects of devaluations.

For Krugman and Taylor, an important factor is the *ad-valorem* taxes, which redistributes income from the private sector to the government, generating an expenditure reduction in the short run. A devaluation will have inflationary effects through the intermediate import costs effects. Deflationary policies come with a cut in the level of activity making that such gains on the inflation front, do not offset the negative effects on the GNP side.[11]

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[10] FitzGerald, E. V. K. and Rob Vos. [1989] *The Foundations of Development Finance: Economic Structure, Accumulation Balances and Income Distribution.* in FitzGerald and Vos (Eds.) Financing Economic Development: A structural Approach to Monetary Policy. Gower Publishing Company, England.

[11] This is in the framework of a *cost-push* inflation, that assumes a fixed mark-up rate.

Barbone [1984] analyses the case in which exports are in hands of foreign owned corporations (*enclave export sector*), and assumes that the only part of the value added generated by those firms that remains in the country, is wages. Under these conditions, as long as a devaluation is in real terms, which means that the relation between tradables and non-tradables improves, the proportion of wages in the total value added of the activity is lower, reducing domestic consumption. The other consideration is that the foreign corporation measures its profits in terms of foreign currency, rather than as a percentage of the depreciated assets that it holds in the country. This implies a relative increase in remittances to fixed assets in foreign currency terms, also reducing domestic expenditures.

Barbone suggests a tax on profit remittances in order to compensate the fall in real wages, implying a fall in aggregated demand, caused by the devaluation.

Assuming a combination of devaluation and restrictive monetary policies, in order to fight inflation, Frenkel, Fanelli and Winograd [1987], argue that in the case of Argentina, in addition to some of the effects discussed before, the restraint of government monetary expansion, will generate a fall in the real money balances, and hence a fall in aggregate demand.

Van Wijnbergen [1986][12] outlined three different path for the contractionary effects of devaluations, not on the demand side, but on the supply side. They are: (i) an increase in the costs of intermediate inputs, (ii) wage indexation in the presence of imported food (or exported) and (iii) the link between the real volume of bank credit and aggregate commodity supply via the financing of working capital requirements.

Singh [1986][13], analyzing the case of Tanzania, specifies the logic of an effective devaluation as one which cuts real wages, '... *making*

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[12] Van Wijnbergen, Sweder. [1986]. *Exchange Rate Management and Stabilization Policies in Developing Countries*. Journal of Development Economics No. 23. North-Holland.-

[13] Singh, Ajit. [1986] *Tanzania and the IMF: The Analytics of Alternative Adjustment Programmes*. Development and Change, Vol. 17

all imported goods (and their substitutes) more expensive in relation to workers' income'. He concludes that the IMF tends to see the problem of inflation as a simple monetary phenomenon and quotes Kaldor who has argued that further devaluations will result in compensating wage demands which will accelerate inflation with the falling of real wages, if wage adjustment falls short of prices increases.

Islam [1984][14] agrees with the neo-orthodox approach that the success of devaluation on the trade balance of a country depends on the level of wage indexation of the economy, but due to monetary contraction that is generated to achieve the balance-of-payments goal, it is highly probable that there will be social and economic costs in terms of increasing unemployment and *'... lower or negative output growth may be quite high'*.

The *income effects* are also present due the changeover of the domestic patterns of consumption due to the *windfall gains* of the foreign assets holder.

Summary Comparison

Comparing both streams of economic thinking, the conclusions concerning devaluation are the following:

The Neo-Orthodox Approach defends devaluations as a feasible instrument for the correction of external imbalances, due to the substitution and income effects -- expenditure switching and expenditure reduction. (IMF/Blejer/Dornbusch).

Based on the traditional *elasticities approach*, devaluation would increase exports and decrease imports, improving the balance of trade.

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[14] Islam, Shafiqui. [1984] *Devaluation, Stabilization and the Developing Countries*. Journal of Development Economics No. 14.

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After setting prices *'right'*, the medium term output in the tradables sector should expand as a result of the new incentives for producers.

Consumers will prefer less expensive domestic goods rather than imported ones.

If there is wage indexation, the impact of devaluation will be jeopardized.

Structuralists doubt the effectiveness of devaluation in LDC's as a mean to correct external imbalance and see three main possible effects (negative) of it: (i) consumption effects (Krugman and Taylor/Diaz-Alejandro/Singh); (ii) supply effects (Van Wijnbergen/Bruno/Frenkel, Winogrand and Fanelli), and (iii) income effects (FitzGerald).

Institutional characteristics, class structure etc. do not permit markets to function in the *smooth* way that the Neo-Orthodox sustain.

Inflation, as a result of the pressure of imported intermediate inputs and capital goods on the costs of production, is also a possible effect. In many LDC's, where the firms can influence the domestic market, the mark-up rate is maintained, transferring the increase in costs to the final price.

Recessionary effects are likely to be found in LDC's applying devaluation as a main adjustment instrument.

Devaluation generates windfalls gains to foreign asset-holders, changing the structural income distribution of the country.

In this study we will use the theoretical approach of the structuralist school because it adjusts to fit the Argentinean reality. The rigidities of markets, that do not react to price signals in the expected way, due to oligopolistic structures, are a reality. Cost-push

inflation and consumption reductions because of devaluation are also present in the Argentinean case with the consequent income effects.

The difference with the structuralist framework in this case is that the real exchange rate is a relevant indicator only if wages are used as the deflator. Also the supply of exports is affected by wages, not from the side of the costs of production, but from the demand side, increasing or decreasing supply according the appreciation or depreciation of the exchange rate according to wages.

This chapter described two of the most widespread approaches to the *theory* of devaluations, with some particular focus. This helps to comprehend some of the characteristics of the model, and the main objectives of this paper.

CHAPTER III

THE MODEL

BASIC CONCEPTUAL CONCERN

EXCHANGE RATE FLUCTUATIONS, WAGES, AND EXPORTS

DEVALUATION AND PURCHASING POWER OF WAGES

CHARACTERISTICS OF THE MODEL

ASSUMPTIONS AND STYLIZED FACTS

THE MICRO-ECONOMIC RATIONALITY FOR THE ALLOCATION OF PRODUCTION

THE MACRO-ECONOMIC SCOPE

THE EQUATIONS

SUPPLY OF FOOD

SUPPLY OF EXPORTS

INTERPRETATION OF THE RESULTS

CONCLUSIONS

THE MODEL

Basic Conceptual Concern

This part of the study contains the model developed and a discussion around the role that each one of the variables used play in it. This discussion also covers part of the rationality of food producers.

Exchange Rate Fluctuations. Wages and Exports.

The exchange rate developed and applied in this model differs from that traditionally used in the role given to wages which are used as the deflator. The discussion concerning profits and competitiveness found in the literature is relegated to a secondary place. The model tests whether devaluation will have an impact on the purchasing power of the population firstly, leading to different conclusions and considerations that seem to reflect the Argentinean reality.

In the literature, wages are commonly used as a way of assessing the competitiveness of the productive sector of a country in relation to foreign markets. [Dornbusch, 1980, 1981, 1988; Krueger, 1978]. This is an extension of the comparison between home and foreign goods in order to evaluate the purchasing power of the local currency.

Edwards [1989] points out that there is a direct relation between the RER and real wages movements, and that RER movements (appreciation - depreciation) will imply fluctuations (increasing - decreasing) in real wages in terms of tradables under the assumption of a non-growing economy with a constant productivity. According to him, this process depends on the elasticity of supply of non tradables in relation to the product wage. If there are no productivity gains, '... *real depreciations necessarily will be related to declines in the real product wage rate for tradables'*.

For Dornbusch real wages in foreign currency are defined as $RER = W_d / (E_n \, WPI_{USA})$, where W_d = real domestic wages; E_n = nominal

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exchange rate or units of local currency for each unit of foreign currency and WPI_{USA} is the wholesales price index of the USA or the relative country or countries. Helmers [1988, pp. 392] adapted it to: $RER_W=(E_n.WPI_{USA})/W_d$, , but in this study we will use $RER_W=E_n/w$, where w are the nominal wages, for the reasons explained bellow.

Originally Dornbusch explained the relation as: $RER_W=W_d/(E_n WPI_{USA})$, this is because Wages are a component of the cost structure of the productive activities of the country, and the rise in this RER means a higher purchasing power of wages in terms of tradable goods (either imports or exportables).

There is a positive relation between the RER and the import spending -the imports are more expensive in terms of wage goods- while there is a negative one between the RER and exports earning. This is due to the fact that imports are cheaper for wage earners, meanwhile, substitutable home goods are more expensive, if the markup rate is maintained, improving the terms of trade for local goods. On the other hand, a lower RER means lower profits for exporters. This could provide an incentive for the reallocation of resources in other activities towards non-tradable (non-export) goods.

For the structuralists, the quantity exported could be a function of *unit profit* on exports, for that reason a viable equation for profits according to FitzGerald - assuming an export sector which has wages and credit costs as its main inputs - is $eP_i-(wl+ki)$, where eP_i is the unit price of exports in local currency, w is the nominal wage, l is the proportion of work in each unity of exports, ki (capital and interest rate) is the costs of inputs. Thus $wl+ki$ constitutes the variable costs of each unity of exports, therefore the difference between both terms is the unit profit on exports. In that sense, e is the endogenous variable that can vary profits, according its fluctuation. This is the reason why the discussion of firms, among themselves, and with the state concerning exchange rate is so important.

Rather than competitiveness or profitability, in our study we will hypothesize that the ER in terms of wages is relevant because of its effects on demand.

Devaluation and Purchasing Power of Wages

The interaction of wages and exchange rate movements and their effect on exports through demand becomes crucial if the following conditions apply to the export sector: a. a low proportion of wages in the cost of agricultural exports and b. agricultural exports are at the same time the principal wage goods.

a. Low Share of Wages in Production Costs of Agricultural Exports: Labour can be related to the production process directly and indirectly. The first is as part of the costs of production and the second is when it is embodied in the costs of inputs and related services.

In the case of the agricultural exports of Argentina, wages are not an important component of the cost structure. One of the main characteristics of Argentinean agriculture is its land extensiveness. Labour is a minor part of the productive process. There are no estimates of the employment generated by the *'Pampean'* agriculture[1], the agricultural economically active population (EAP) accounts for the 16% of the total EAP, while most of the labour intensive activities are separate from the exportable sector, mainly vegetables, sugar-cane, tobacco, fruits, grapes but not grain or cattle. A farm of 100 hectares can be run by 4 or 5 full time workers with a 100 H.P. tractor, hiring a mechanic harvester during 3 or 4 days[2]. Argentinean agricultural exports do not lose competitiveness due to increases in real wages. The comparative advantages of a rich soil, mild weather is remarkable high enough to compete even against highly protected exports from other countries. It is argued; '... *The rent of the soil ...was, and still is, defined fundamentally by the international differences in costs*

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[1] The 1980 population census shows that the 5.6% of the total EAP of the country is related to the agricultural export sector. The data of the 1989 Agrarian Census is not published at this date.

[2] This is according to Giberti, [1988] *Evolution of the Argentine Agricultural Sector and Its Prospects.* In a presentation to the XX International Conference of Agricultural Economist held in Buenos Aires, he said that in 1937 '... a total of 5.4 persons worked a farm ... now there are only 2.5' This is according the Provincial Census of 1981. Also he pointed out that in 1937, 130 for every 100 permanent employees were temporary. In 1980 this figure dropped to 25. He also gives the figure that wages constitute the 17% of the total farm output value in the *pampean* region.-

originated in the quality of our soils and weather. They can not be imputed to the overexploitaion of labour.' [Flichman, 1977][3]

Labour could have an indirect relation with the production of exportables via inputs or services, but also this case is not very clear in the Argentinean case. If we look to the most important inputs, that account for 85% of the costs of production, we find that fuels, machinery, seeds and chemicals embody a very low relative amount of labour. The same happens with transport, while only storage could have an impact in a stronger way, but its participation in total costs is negligible.

<u>b. Main Exports as main Wage-goods</u>: Another important factor for the use of wages as the deflator of the RER is that agricultural exports are also the wage-goods of Argentina. This influence comes from, not to the supply side like above, but from the demand side. The higher are the wages in foreign currency terms, the higher will be the demand for exportables, pushing some producers to sell to the internal market rather than internationally.

FitzGerald [1989: pp. 83][4] proposes the following equation for the primary sector market balance:

$$ep_1 \ Q_1 = aW + ep_1 \ E \qquad \text{(a)}$$

where e = nominal exchange rate; p_1 = world market price for agricultural products; a = propensity to consume food; W = total wage bill (resulting from multiplying wages -w- by labor force -L-); E = exports, and Q_1 = total agricultural production. Prices and exchange rate are exogenous.

Doing elemental algebra on FitzGerald's equation:

$$Q_1 = (aW + ep_1E) \ / \ ep_1 \qquad \text{(b)}$$

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[3] Flichman, Guillermo [1977] *'La Renta del Suelo y el Desarrollo Agrario Argentino'.* Editorial Siglo XXI, Mexico.-

[4] The model is a basic one of a semi-industrialized economy and assumes that only agricultural exports. The non-agricultural sector (industry) produces non-tradables.

Here we assume that in equilibrium, the quantity produced of primary products, in physical units, is influenced by the wages multiplied by the propensity to consume food $(0 < a < 1)$ and exports. The price is always the international price multiplied by the nominal exchange rate.

Returning to the original, we also can obtain a rearrangement of the terms and dividing by ep_1:

$$E = Q_1 - awL/ep_1 \qquad (c)$$

The quantity produced of primary products less the quantity demanded by the wage sector of the economy equals the quantity of exports.[5] This gives an inverse relation between E and aW/ep_1.

To put the equation in FitzGerald's terms, real wages are the ratio of the nominal wages (w) and the consumers price index (p'). The price index p' is the weighted average between the prices of food and non-food (or tradable and non-tradables), according to their respective propensities.[6] This brings us back to equation (c) where the exports are the difference between the supply (quantity produced) and local consumption.

From this standpoint, in the Argentinean case, with 70% of exports of agricultural origin and a strong industry as the result of *import substitution strategies*[7], it is a sustainable argument that the decreasing real wage would imply an increase in the exportable surplus of the country. At least in the short run, when the fields are planted, the only productive decision can be if the harvesting is faced with more or less care in order to achieve higher yields.

From the demand side of exportables, Diaz-Alejandro [1965] estimated the following function: $C_e = [P_e, W, T]$, where C_e is the consumption per capita of exportable goods, P_e is the price of exportables, W is the

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[5] It is assumed that wage earners are the only food consumers in the economy.-

[6] In FitzGerald [pp. 89] $w' = w/(ap_1e-(1-a)p_2)$, where the denominator is p' or the price index and p_2 is the domestic price of non-tradables.-

[7] This implies low prices for food in order to *subsidize* industry paying lower wages.

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real average wage, and T is non-wage income. Where $C_e'{}_{Pe} < 0$; $C_e'{}_W > 0$; $C_e'{}_T > 0$. The results that he found are:

$$C_e = -5.19 \ P_e + 0.25 \ W + 0.05 \ T$$

In this scenario, all the coefficients were significant, and is clear that the coefficient for wage earners is higher than the one for T.[8]

Diaz-Alejandro also calculated the marginal propensities to consume exportables, obtaining 0.36 for wage earners and 0.16 for non-wage earners. The quoted study also points out that the simple correlation coefficient between C_e and W is 0.74, while with T it is only 0.10 [pp. 92]. Based on the demand for exportables function, the price elasticity is -0.35, considerably less than one.

Although Diaz-Alejandro's thesis uses old data, he continued observing the behavior of the Argentinean economy, until his last days, and did not ever change his mind concerning this point.[9]

A huge discussion has been taking place in Argentina around this subject, where some authors started to show that the problem is not *only* the proportion of workers consuming exportables, but also non-workers, that consume as much as workers of these goods, presenting similar propensities and income elasticities [Cortez, 1981; Marshal and Cortez 1985]. Many of those authors were mainly concerned with the political pressure of some entrepreneurial organizations trying to stop real wages' recovery after the return of democracy to Argentina.

Dornbusch [1989][10] points out that real wages are a defined function of the nominal wages divided by the CPI, *Consumers Price Index*, and CPI is a function of domestic non-agricultural prices (PD), agricultural

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[8] The R of the regression was .90 and DW=1.63 according to Diaz-Alejandro calculations.-.

[9] Diaz-Alejandro, Carlos F. [1982] *'No Less Than One Hundred Years of Argentine Economic History, Plus Some Comparisons'*. Center Discussion Paper No. 392, Economic Growth Center, Yale University.-

[10] Dornbusch, Rudiger [1989] *'Argentina After Martinez de Hoz'* in Di Tella G. and R. Dornbusch (eds.) *'The Political Economy of Argentina, 1946-1983'*. Mac Millan Press.-

prices (PA), imports prices (PM) and government goods and services prices (PS). All the variables contribute positively to increase the CPI, therefore maintaining nominal wages constant, implies a reduction of the real wage. For Dornbusch PA and PM are the tradables, while PS and PD non-tradables. PD = aW(1+r), where 1/a is the labour productivity (a=unit of labour requirements) and r is the real financial cost.

The resulting behavioral equation after combining the 3 precedents is:

$$w = w[PA/PM, PM/PD, PS/PD, a(1+r)]$$

This shows that a rise in the numerators leads to a reduction in real wages, thus a improvement in the external terms of trade PA/PM. A devaluation PM/PD, an increase in the cost of goods and services provided by the state, a fall in labor productivity (rise in unit labour requirements), or a rise in the real interest rate, will lead to a reduction of the real wage. In our case we are interested in the effect of an increase in exchange rate. In the absence of commercial policies, a devaluation, will maintain the relation of PA/PM while raising the PM/PD ratio. If PS/PD maintain its coefficient, this implies an increase in PS, otherwise a state subsidy on services and goods in the case of a reduction, or the absence of the subsidy in the case of an augmentation.

'The discussion on real wages already shows that income distribution between workers and producers of agricultural goods is tied up in the question...Gaining real wages growth consistent with no deterioration of the real exchange rate clearly means either a deterioration in the world real price of agricultural goods or else commercial policy that redistributes income away from Agriculture.' [Dornbusch, 1989 pp. 134]. This will clearly reduce the quantity of exports in the short run, worsening the external balance.

This helps us to understand why wages are an important indicator of the behavior of Argentinean Exports, especially since 1975 when there was a change in the trend of relative prices [11].

Characteristics of the Model

The model is a partial equilibrium one. It analyses the determinants of the behavior of the agricultural output and its allocation. It attempts to show that a devaluation only will be successful, in the neoclassical terms of improving the exports, if it has a negative impact on real wages; In other words, when the change in the nominal exchange rate is higher than the rate of change in nominal wages, rather than the relative prices of tradables *vis-a-vis* non tradables, as is pointed in the theory.

The model tries to show that agricultural exports (QX_A) do not depend on supply effects due to relative prices incentives, but on the demand side of the economy, in relation to the purchasing power of the average wages.

Assumptions and Stylized Facts of the Model

The basic assumptions of the model are:

(i) a small country, whose production can not influence international price or demand, that produces food, part of which is consumed internally and part exported. There is no difference between the food consumed domestically and that exported, but part of the food produced is not exported. The country does not import, under any circumstances, food.

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[11] In June of 1975 is when the collapsing democratic government suffered the first pressures of the *liberal* wing of the army and was pushed to perform an orthodox adjustment raising the price of public services, the exchange rate and releasing price controls. The pressure of the unions, plus the political instability finished; started the repression and concluded in the *coup de etat* of March, 1976. The genocide of the police state resulted in the *missing* of more than 10.000 people, breaking down any resistance to the economic plan. This explains the sharp decrease in real wages during 76-79.-

(ii) Technology is assumed to be homogeneous technology, accessible to every producer, and it does not change substantially during the period of study.

(iii) Every producer can sell to the domestic or the external market with no limitations, and maximize benefits.

(iv) The producers that export are paid by the Central Bank in local currency. The model assumes a yearly average ER.

Stylized Facts

The model tests the impact on the demand side in the face of a devaluation. The basic dynamic of the model can be described from the micro and macro points of view.

The Micro-economic Rationality for the Allocation of Production

Producers of tradables face two different markets, but they can choose freely to which of the two they sell their products

As is expressed in the model, the price on which the production is decided is the international one. This plays the role of *reference price*, acting as a *floor price* in the domestic market, bellow which the quantity produced, or at least harvested would not be the same, but there also taken into consideration is the domestic demand, and its behavior.

The dynamic of the domestic market shows that the internal demand can be satisfied as long as the domestic price is higher than the international price less export taxes and costs of freight and insurance. Bellow this point, all the production goes to foreign markets.

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Tentative Graphic Representation
Of Output Allocation Of Exportables
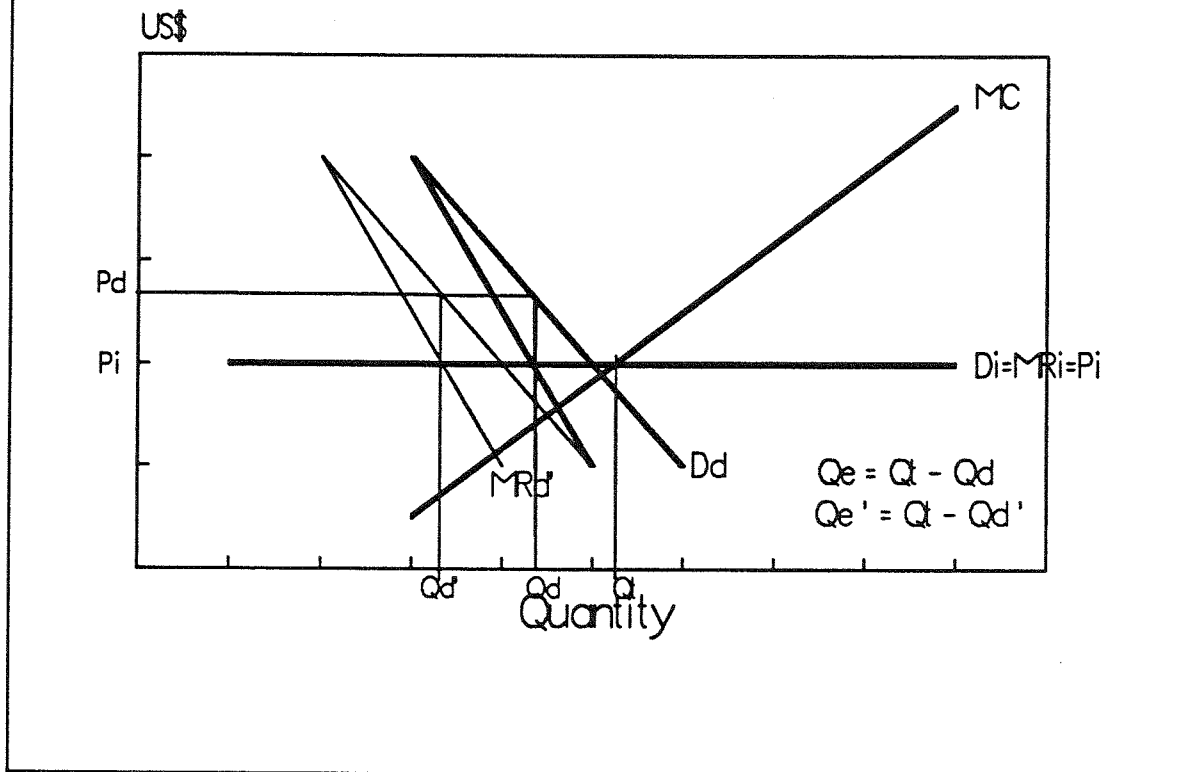
Orthodox microeconomics text books would indicate that the producer maximizes revenues in the case of the graph, when MRd=MRi=MC (marginal costs equals marginal revenue international and equals marginal revenue domestic). This means that the production is sold in the domestic market until the marginal revenues of both markets are equal. This implies that the domestic consumer pays an *overprice* for the product. From that point, the production is sold abroad until the marginal costs equal the marginal revenues of the foreign market.

In the graph we find that D_i is the internationally defined demand, which is perfectly elastic. D_d is the domestic demand for exportables, which presents a downwards slope. MC_g are the marginal costs facing the producer. MR_d is the marginal revenue in the domestic market and MR_i the marginal revenue in the international market.

Because the country is a price taker in the world market, and the domestic market is sensitive to the prices offered by domestic producers, $MR_d < P_d$; $MR_i = P_i$. This assumption could lead to the idea that

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the international demand has no importance in the export market, but the fact is that at the international price Argentina, with the actual production, can sell all its output. This situation can not be maintained forever, (increasing the production infinitely), because it will end in the role of price maker, starting to influence in world production, but the assumption stated before is crucial for the model.

The domestic market is supplied as long as the MR_i is less than MR_d. The quantity supplied to the domestic market is Q_d at the price P_d, and the difference between Q_t and Q_d is Q_e, the quantity that goes to the export market.

A devaluation in terms of wages, will lead to a downward shift of the curve D_d to D_d', and due the oligopolistic characteristics of the domestic market, the price in terms of currency, remains the same, then $Q_d' < Q_d$ and $Q_i' > Q_i$.

A rise in the international price will shift D_i upwards and will have the same effect as a devaluation in the short run. This means that an improvement in the international terms of trade of the sector, *ceteris paribus*, has negative effects on the food consumers of the country.

If the *ad-valorem* export taxes are lifted, the marginal revenue of the external market will shift upwards the same proportion as the amount which the tax used to be, lowering the quantity consumed in the domestic market and increasing domestic prices of exportables according the elasticity of the internal demand.

This argument returns us again to what is expressed by Dornbusch [1989] concerning the discussion around income distribution between workers and agricultural producers.

The Macroeconomic Scope

From the Macroeconomic point of view (graph below), the domestic demand (D_d)is satisfied until the point P_i, the international price. Beyond that point the supply goes to the international market.

Supply and Demand for Exportables

US$

Dd'   Dd   S

....Pi

Qe = Qt - Qd
Qe' = Qt - Qd'

Qd'   Qd   Qt
Quantity
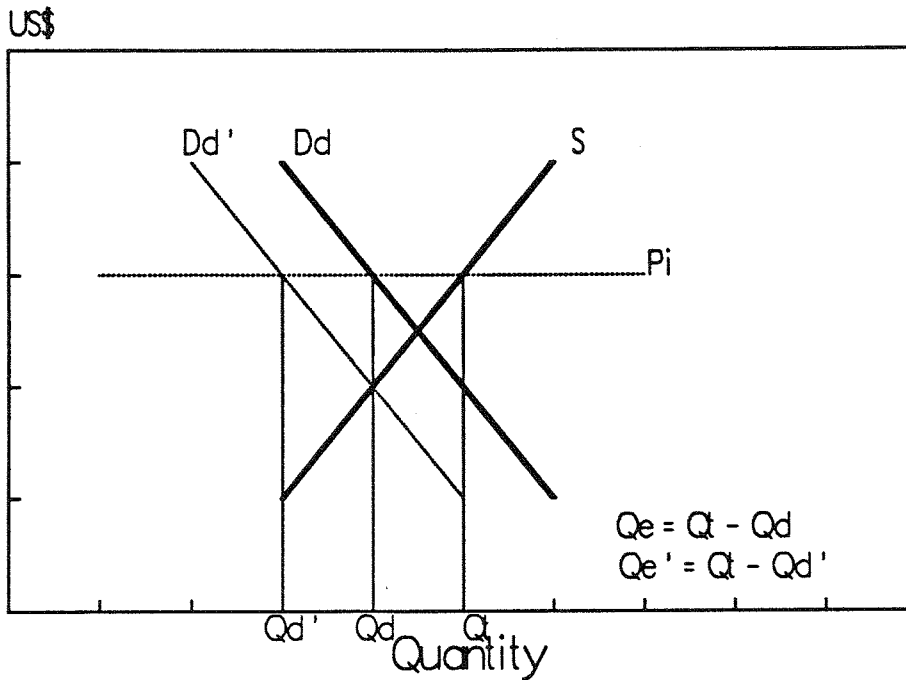
A devaluation has an impact on the demand side, shifting the curve downwards, to D_d'. This is so because D_d is the domestic demand at a given exchange rate according to wages. If the relation with the exchange rate increases, this will mean a lower purchasing power in terms of tradables, generating the effect expressed above. At a given price, domestic consumers will want a lower quantity of exportables after the devaluation.

This has also the assumption that the supply curve remains in the same place, which, according to the observed behavior of the producers in Argentina, characterized by the *dollarization* of the economy and the absence of technological change, seems to be reasonable. The supply reacts to the international price, being the exchange rate faced as *premium* if it is appreciated or depreciated.

Here in the graph we distinguish, according to the shape of the demand curve, that the effects on the quantity will be different. The structuralist defend that in LDC's the elasticity is very low, which

implies that changes in the exchange rate would have to be very important in order to be reflected reasonably in the quantity destined to exports.

The following graph shows the effect of an increase in the terms of trade or a lifting of export taxes. The international price will be relatively higher, and moving along the demand, the new point until which the production will go to the domestic market will be Pi', increasing the price paid domestically and reducing the quantity to be sold locally.

Supply and Demand for Exportables

US$

Dd   S

Pi'
Pi

Qe = Qt - Qd
Qe = Qt' - Qd'

Qd" Qd   Qt Qt'
Quantity
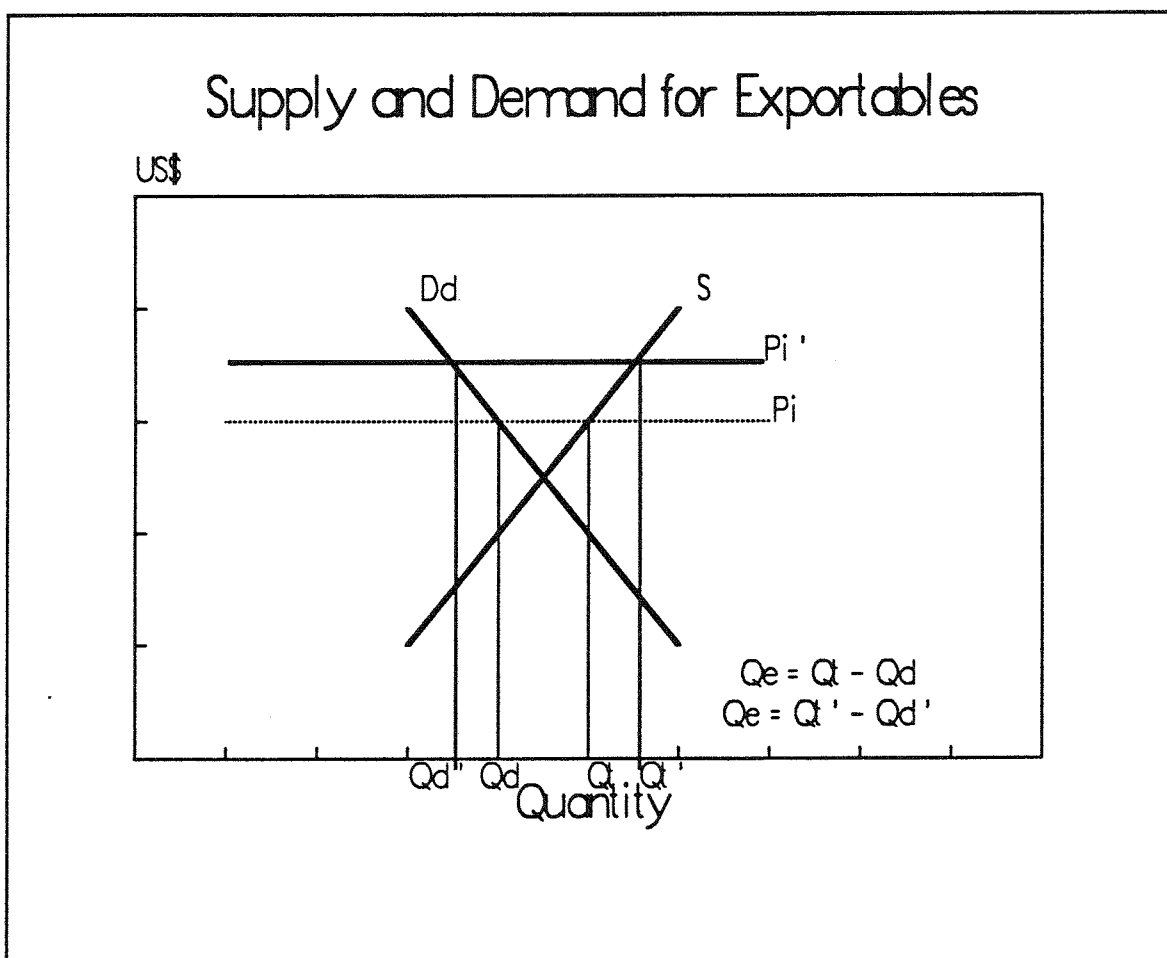
As we can see from these two angles, the strategy of increasing what are called *traditional*[12] exports, necessarily implies in the short run the deterioration of the purchasing power of the population. Since the exports are not luxurious consumption in the country or goods marginally

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[12] These include primary products, especially grains.

consumed, the erosion of the purchasing power, in order to increase exports, has to be very deep, to firstly reduce savings, secondly durable goods, later luxurious consumption and finally food.

The Equations

The model has three main equations, the *supply of food* function (QF_T) *agricultural exports* (QX_A) and the *domestic supply of food* (SF_d). It has three exogenous variables: the area planted in hectares (A_H), the international price of agricultural exports (P_i) and the ratio of the nominal exchange rate and nominal average wages (RER_W), and three endogenous variables: QF_T, QX_A and SF_d.

The equations that constitutes the model are:

$$QF_T = f \underset{(+)}{(H_P}, \underset{(+)}{P_i)} \qquad (1)$$

$$SF_d = f \underset{(-)}{(RER_W)} \qquad (2)$$

$$QX_A = QF_T - SF_d \qquad (3)$$

In a reduced form, substituting 2 on 3:

$$QF_T = f (H_P, P_i) \qquad (1')$$

$$QX_A = f \underset{(+)}{(QF_T}, \underset{(+)}{RER_W)} \qquad (3')$$

Supply of Food

The supply function for food, has as a dependent variable the total quantity of food produced in the country (QF_T), and also includes other crops that are not exported, like tropical fruits, vegetables, etc. and excludes industrial crops like sugarcane, tobacco, forestry, etc. The function is as follows:

$$QF_T = f (H_P, P_i) \qquad (a)$$

QF_T being the total quantity of food produced in the country, H the area planted in hectares and P_i the international price of agricultural exports.

The International Price

In the model the relevant price that the producers take into account is the international one. As was said in the previous chapter, the participation of exports in the total production of food is a majority. In the case of wheat or corn, the domestic consumption reaches almost 45% while in the case of oilseeds it is less than 25%. Oils and flours are evenly distributed.

Notwithstanding government controls on prices in the internal market, especially for bread and meat[13], the price for the tradables is the international price[14]. This is as long as the demand elasticity for Argentinean QX_A is infinite at the given international price, or said in other words, Argentinean production cannot influence the world price of those goods, and there are no quotas for those exports. The price fixed in Chicago or London is the relevant one for those products. Only when there is a severe revaluation, we can see that the growth of internal prices of agricultural products is somehow higher than the international ones. (e.g. 1979 1980 1986), while during the rest of the period under study, the international price is the reference for the internal market.

This reference price operates as a floor price. Producers take the exchange rate fluctuations as *a premium* for the basic price set by the international market. During the last years, the behavior of the majority of domestic prices *vis-a-vis* the foreign ones have been very stable. (graph 1 in chapter one). The premium is not ever big enough to put under risk the profits of the producers, in the case of a lag in the exchange rate, but it can be big enough to generate windfall gains in the short run.

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[13] As in many countries bread had a maximum price during several stages of the Argentinean economy. The meat also had a so-called *political price*, but the other products like corn, soya, linseeds, fruits, etc. were not subjected to controls in the internal market.

[14] This can be related to the largely discussed *Law of One Price*, but, I don't think that international price is the *equilibrium price*. It is just the price determined by the political power of producers and governments for those goods at the international level.-

The Use of Area Planted in the Function

In the neoclassical tradition a normal production function for agricultural products is:

$$Q = f (K , N , L)$$

where Q is the total output, K is the capital invested, N is the labour and L is the land. The relation of Q with the three is direct.

In the model, we assume a given and homogeneous technology and a given ammount of labour; for this reason the relation between K and N is constant, but according to price variations, producers can vary the output.

The price plays a double role in this relation: the area planted over the total area is a function of the price at the moment of planting:

$$H_p/H_t = f(P_i)$$

where H_p is area planted and H_t is the total arable land. Because H_t is constant, the variation of H_p is function of P_i.

There is a second relation between area harvested and area planted, that is a function of the price during the period of cultivation and harvest. A producer can harvest his plot until the marginal revenues equal the marginal cost of harvesting, leaving part of the production in the field, unharvested on letting the cattle eat it. This latter relation is also function of the price.

For our purposes we can assume that due to the comparative advantages already mentioned of the *pampean* agriculture, there is no difference between H_t and H_p, while there it is between H_p and H_h (area harvested) due to the emphasis or care that a producer can have during cultivation and harvesting.

The points stated before make us agree with Taylor. Taylor [1983][15] assumes that the agricultural sector is *resource-limited*, and supply does not respond to prices or other incentives in the short run. The base of production still being *land* which '...*can be assimilated with capital so that sustained food output increases can only come from investment activities such as land-clearing, mechanization and works for irrigation.*' [pp. 38]. '*In formal terms, agricultural output is determined by available capital stock*'. [pp. 39].

For this reason, and understanding an absence of response to price, the equation for agricultural output is defined by Taylor as: $X_a = aK_a$; where X_a is the food output[16], a is the capital-output ratio, and K_a is the capital investment in the sector.

We used the double log equation in order to achieve the elasticity coefficients. In order to test the significance of export taxes (*ad-valorem* deducted from the *letter of credit*), we regressed them as part of the equation, and the significance was extremely low (t = 0.799) for the period. Wages were also regressed showing a t coefficient of 0.892, while the other two variables, area planted and international price showed significance.

The equation arrived at is:

$$\text{Log}(QF_T) = -0.927 + 0.429 \, \log[H_p(-1)] + 0.683 \, \log(P_I)$$
$$(2.846) \qquad\qquad (4.521)$$

QF_T is the total quantity of food, H_p is the area planted in hectares and P_I is the international price of agricultural products.

Due some doubts about auto-correlation (the DW coefficient was in the inconclusive area), we decided to correct with the Cochran-Orcutt test, improving the DW from 1.388 to 1.820, and maintaining significant the independent variables.

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[15] Taylor, Lance [1983] *'Structuralist Macroeconomics'*. Basic Books Inc. New York.-

[16] For Taylor agriculture only produces food.-

The t coefficients were: H_p = 2.846 and P_I = 4.521. Adjusted R^2 = 0.867 and F-statistic = 38.17 [17]. The correlation analysis does not show multicollinearity between H_p and P_i.

The variable H_p is lagged one year due the characteristics of a big portion of the food production. Theorizing the equation we could say that the total quantity of food is the result of the area planted the year before and the results of the cultivation and harvest of this year as a result of the international price.

In order to see the effects of the internal agricultural prices we added to the equation the agricultural terms of trade index (agricultural/non-agricultural) and the domestic agricultural/international agricultural prices, but they did not have any degree of significance in the equations. With this detail it is concluded that the unique price for the food production is the international one.

To test stability of each independent variable, we tried to regress each one of them, and they show similar coefficients as the multiple regression, which implies that the variables are equally significant.

The Supply Function of Exports

This equation is the one that explains the quantity of exports according to the production of food and the ER deflated with wages. The resulting equation is

$$\log(QX_A) = a + b \underset{(+)}{\log(QF_T)} + c \underset{(+)}{\log(RER_W)}$$

. where QX_A is the Quantity of Exports, and RER_W is the real exchange rate defined. It is important to mention that the same equation was used with other deflators, discussed in chapter 2: GDP, WPI and CPI. All of them showed a negative coefficient for both the official and parallel exchange rate in the equation.

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[17] Pr(t>2.846)=0.005; Pr(t>4.52)=0.001.-

The different exchange rate were also adjusted by the *ad-valorem* export taxes, obtaining negative results. These factors plus the ones pointed to at the beginning of this chapter lead us to confirm the use of wages as the deflator.

The resulting equation is:

$$\log(QX_A) = 3.453 + 0.804 \underset{(8.159)}{\log(QF_T)} + 0.115 \underset{(2.681)}{\log} (RER_{W(T-1)})$$

Adjusted R-Squared = 0.772; DW = 1.8379 and F = 33.308.

The reason for lagging RER_W one year is because exports have *pre-financing* from the government, that can sometimes be until 270 days before the harvest; the bulk is sold to brokers, either external or domestically, a couple of months before the harvest.

Interpretation of the Results

The Supply of Food Function

The equation shows, first of all, that both variables used are statistically significant. The coefficients show low responsiveness of the supply of food to changes in the international price (P_I). The elasticity coefficient is 0.683. This implies that a change of 100% in the international price will increase by 68.3% the production of food. The sign of the coefficient is the expected one.

It is important to remark that the elasticity coefficient is higher than the one expected in agricultural production. Further research disaggregating agricultural tradables and non-tradables is a must, because is hard to belive that some prices of non-traded goods have such a response to international prices, although it is possible that producers of exportables shift backward and forward according to international prices.

The coefficient for the planted area (H_P) is also lower than unity (0.429). This is because the land with the comparative advantages is

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already fully employed, and increasing new land is limited and always has lower productivity than the best ones, as was pointed out by the Ricardian land rent theory.

The Supply Agricultural Exports of Exports

The analysis shows that, as expected, the growth of the quantity of agricultural exports is closely related to the growth of total food production. The elasticity coefficient is 0.804, showing that agricultural exports increase almost equally with food production.

On the other hand, it is clear that the exchange rate deflated by wages, being significant, presents a very low elasticity (0.115). This confirms our first point concerning the notion that real wages have to be substantially eroded in order to increase exports.

With the data available we calculated the marginal propensity to consume food:

$$FC_{PC} = a + b \ W_{PC}$$

We obtained a coefficient of 0.165, taking an index of the average urban real wages, deflated by CPI, regressed to an index of food Consumption per capita. The t statistic is 1.90, adjusted $R^2 = 0.746$ and DW corrected with the Cochran-Orcutt = 1.41.

The coefficient for food consumption is very low, and this is why we support the relevance of the model. In this sense we agree with Fitzgerald's [1989][18] statement that '... *a low food consumption coefficient will also increase external vulnerability, as real wages have to be cut disproportionately in order to provide surplus products for export.*' ... '*In sum, stabilization may well be much easier (in terms of the required variations in real wages and employment) in either non-industrialized or fully-industrialized economies, than in semi-industrialized ones.*'

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[18] FitzGerald and Vos [*op.cit.*]

As a way of complementing this analysis, we regressed in a double logarithmic way, QX_A to real average urban wages (W), deflated according to the CPI.

$$\log (QX_A) = a + b \log (W_{PC})$$

The result of this operation shows a negative relation, with a coefficient of -0.150 for wages t-stat=-2.571 adjusted R^2 = 0.662 and corrected DW = 1.901.

This leads us to conclude that a decrease of 1% in wages implies a rise of 0.15% in the quantity of exports. This underlines the social cost that a strategy of increasing primary exports has in the economy. The latter analysis tends to test in a more reliable way our conclusions. Wages are negatively related to exports in a very significant way.

The situation described above is highly relevant. As long as the exports are not manufactured goods, and the surplus is not appropriated by sectors that re-invest in industries outwardly oriented, the conflict between agricultural producers and the rest of the population will still be present.

Conclusions

Within the framework of this study, there is some evidence that the only way of increasing exports by the amount needed to face the external burden of Argentina (i.e. servicing of the foreign debt), is by a large devaluation. This has a strong social cost, and is mainly paid for by those who have less, not by those that toke the credit later *socialized* by the state.

The characteristics of Argentinean economy, a large middle-class and an industry devoted to the domestic market, plus the factors already cited relating to the agriculture and exports market, reinforces FitzGerald's statement that the cut in wages has to be disproportionate in order to raise the availability of products for the world markets.

This chapter, the central one of the study, shows the behavior of Argentinean exports and the extent to which are related to domestic demand, rather than to supply factors, highlighting the limitations of devaluations as a efficient instrument of policy-making.

Appendix I

Food Supply Function with Non-Homogeneous Technology

In our model we assumed homogeneous technology. We will now lift this assumption using the possibility of a non-homogeneous technology, following the ideas developed in chapter 3.

The mechanism underlying these is as follows: producers decide how much land to plant(H_p) depending on the world market price (P_i) in the year t-1. Higher prices will tend to increase the area planted.

The yield (Y), defined as the ratio of total output to area planted, is a function of the international price in the year t. If the price during the cropping is good, producers will improve their techniques of cultivation and harvest in order to make more efficient use of the resources already committed when planting. This can be achieved by using additional pesticides, more hours of machinery and labour for cultivation, or a slower, more careful and more expensive mechanical harvesting. Also some techniques of storage can be improved if the price is good.

The total quantity of food produced (QF_T) is then a direct function of the area planted the previous year and of yields.

This equation applies to the aggregate of food production. We think that the results could be more accurate if the production of food could be divided in *campaigns*[1] (as they are called in Argentina) in order to make precise the behavior of each one of the crops.

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[1] Campaigns are called each one of the big group of crops e.g. coarse grains, vegetables, potatoes, sugar-cane, etc.

<u>The Equations:</u>

$$H_p = f\ (P_{i\ (t-1)}) \qquad (1)$$

$$Y = f\ (P_i) \qquad (2)$$

$$QF_T = f\ (\ H_{p(t-1)}\ ,\ Y\ ) \qquad (3)$$

The statistical results of the double log regression were:

(1) $\qquad\qquad \log H_p = 8.887 + 0.488 \log\ (P_{i\ (t-1)})$
$$(2.0744)$$

Adjusted R-squared: 0.669. DW: 1.908. N: 19. F: 19.19

(2) $\qquad\qquad\qquad \log Y = 3.904 + 0.379 \log\ (P_i)$
$$(1.929)$$

Adjusted R-squared: 0.408. DW: 1.881. N: 19. F: 5.52

(3) $\qquad \log QF_T = -7.207 + 0.845 \log\ (H_{p\ (t-1)}) + 0.756 \log(Y)$
$$(6.334) \qquad\qquad (4.532)$$

Adjusted R-squared: 0.782. DW: 1.675. N: 19. F: 33.42

We find that the coefficients are significant in all the cases. Only equation (2) shows a rather low value for R^2, which limits its forecasting power. This problem could be solved with a more careful analysis, as was stated before. In any case, the overall results are consistent.

<u>The Supply of Exports and Multiple Exchange Rate</u>

In a large portion of the period under study, a system of multiple exchange rates prevailed. The government set a parity rate for commercial transactions, another rate for financial operations and sometimes even a so called *tourist dollar.* Eventually these modalities were combined with the existence of a parallel market, that although it

was *illegal*, its parity was announced by the media as part of the daily economic information.

This justifies an attempt to study how export performance has been affected by a multiple exchange rate system, and especially the parallel market. It is reasonably argued that when the premium between the parallel market and the official one is wide, pressures for devaluation arise. This opens the possibilities for producers to try to preserve the value of their capital through a mixture of *under-invoicing* and *under-reporting* of exports. This allows them to obtain *windfall gains* in order to face the next season or to get hold of foreign assets to be changed for domestic in better circumstances, generating some of the *income effects* of devaluations stated in chapter 2.

The following equation tests the hypothesis of *under-reporting*, because we use the quantity of exports assuming that exporters would under-report their exports when the gap between the official and parallel exchange rate is significant, expecting either a devaluation or the possibility to change foreign currency at parallel rates. It is clear, however, that a linear relationship between the premium and exports cannot be expected to hold: there are limits, not only to the premium, but to the length of the period that an exporter can hold his earnings in dollars.

It was then decided to work out this relationship using a dummy variable with a value of 1 when the gap between the official and parallel exchange rate was higher than 15% for the average of the whole year, and zero when the gap was less than 15%

The function is:

$$QX_A = f (QF_T , RER_W , Dummy)$$
$$ (+) (+) (-)$$

Using the double log regression we obtained:

$$\log QX_A = 3.536 + 0.813 \log(QF_T) + 0.094 \log(RER_{W(t-1)}) - 0.08 \ dummy$$
$$ (8.653) (2.20) \phantom{\log(RER_{W(t-1)}) } (-1.659)$$

Adjusted R-squared: 0.794. DW: 1.640. N: 20. F: 25.41.

The results are satisfactory, although the coefficient for the dummy variable is only significant at 10%. We think that a future study should work with smaller periods of time, perhaps four month periods, in order to reflect short term variations, that reflect the severe variations in the gap during certain periods, that reached peaks of more than 150%.

CHAPTER IV

FINAL REMARKS AND CONCLUSIONS

Final Remarks

In this study we tried to show the strong negative relationship that there is between exports and wages in the Argentinean economy.

In the framework of *Structural Adjustment Programmes*, the IMF, World Bank and the different voices of the powerful economic groups are trying to convince the population that the only way of return *to the grandiose road* that Argentina had at the beginning of the century would be with a similar strategy: *taking advantage of comparative advantages*.

People that remember the 40's and 50's, when the domestic market developed very fast, have some mixed feelings around the possibilities of an outward growth via *low wages*. The *differential rent* obtained thanks to the rich soils of the *pampas* was the engine of the economy. What those supporting the *SAP's* tend to hide is that the state appropriated an important percentage of that rent and *redistributed* it within the society in the form of social expenditures and investment, generating employment and enhancing the domestic market.

Today the urgencies of the state have to do with the payment of the *socialized*[1] foreign debt and to support, in a *social welfare state fashion*, the over-crowded public enterprises, otherwise the number of unemployed would be much higher than the 9% of the EAP that Argentina shows now.

The traditional *medicine* is to increase exports, stabilize the economy fighting inflation, reduce the fiscal deficit and privatize. The gains on the external front come hand in hand with recession, unemployment and poverty.

To increase exports governments devalue the local currency sky rocketing the inflation due the *'dollarization'* of the economy[2]. To

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[1] Because the private debt was transferred to the state and the total population first with the state warranties when the boom of the external borrowing; second with the so called *change insurances* where the state assumed part of the debt due high exchange rate fluctuations, and lastly by the assumption of the debt as a global package and assuming the *auditing* of the IMF.

[2] According Taylor [1988] 80% of the imports of Argentina are intermediate goods.

succeed in devaluation wages cannot increase at the same path , loosing purchasing power. The reduction of export taxes plays a multiple role in the economy: at the same time that it improves the gains of exporters, pushes up domestic prices of exportables, as was expressed in the model, and reduces the collecting capacity of the state, increasing the fiscal deficit. Furthermore, the availability of more dollars in the market, and the need to face the external debt, push the state to maintain or increase the emission of local currency in order to buy the dollars that are in the market, increasing inflation. To reduce competition in the currency market, the government, increases interest rates, fueling it further.

The *inflationary tax* is paid by wage earners. The state maintains its *seigniorage* and indexes taxes, defending itself from inflation. Firms adjust prices with the same aim.

If the state decides not to buy from exporters, who are therefore forced to sell at lower prices, and with fewer importers deciding to buy due to the recession, revaluation is more than a possibility.

If there are no serious controls, capital flight, a form of waiting for better times to buy inputs and assets, is the next step. This leads to a process of *bi-monetization* of the economy, bringing back dollars according to needs or when a devaluation takes place, producing income effects of magnitude, and using the local currency just as a short lived *means of payment*, but not a measure of value, because that is the role of the dollar. This is clear in the model where the international price is the reference point and that nominal exchange rate plays no role in the supply function of food.

Meanwhile, wages is the variable that adjusts in the economy. The government and the international advisors continue insisting that a new devaluation has to take place. And the cycle starts again.

As the model points out, the devaluation has to be so deep that it must erode the purchasing power of the people in such a way that it will reduce the level of domestic activity. Exports are only the 10% of the total Argentinean GDP. The gains on the external front, cannot compensate the dramatic effects on the domestic one.

It is in this sense that analyzing the performance of the Argentinean economy from the viewpoint of wages it is so important. It is rather fanciful to play around with some sort of *macroeconomic* variables that do not take into account the social effects and costs of some policy instrument.

This exercise started with a quote of a new from *The Financial Times* and will finish with another quote from the Argentinean newspaper of highest circulation *'Clarin'* [6 of October 1990] that stated that due to the high exports during the first 8 months of 1990 there is the possibility that Argentina will have to import flour. Surely the economic *gurus* of the establishment will argue that this is the effect of the *lag* in the exchange rate, rather than the extremely low consumption of the first period of the year.

The Hague, October 1990.-

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