

GROWING WITH DEBT: STRATEGIES FOR ARGENTINA.

Juan C. Rego
CEMA-CONICET
Virrey del Pino 3210
(1426) Buenos Aires
ARGENTINE

ABSTRACT

Argentina's economic growth is seriously threatened by the service of the external debt, when this is compared with Argentina's payment capacity. The difficulties in the accomplishment of the mentioned payments has caused the decrease of the value of the Argentine debt's bonds in the secondary markets. This has carried on to the formulation of repurchase strategies of the debt, proposed by Fernandez(1987) and Rodriguez (1988, 1990), which are examined here. For this purpose a simple growth model type Harrod-Domar is coupled to the debt, which grows in function of the unpaid service. Meanwhile, the market price of the debt is governed by a behaviour equation, formulated by Rodriguez (1990). A resulting System Dynamics model, which continues a previous work (Rego 1988), permits to simulate alternative scenarios for the economic growth and debt management.

1. Introduction.

The acceleration of the Argentine indebtedness process is observed towards the end of the decade of the seventies, situation which reaches crisis point in 1982, and lasts up until now. The Argentine tragedy lies in the evident imbalance that exists between the rate at which the debt grows, let us say, a 6 percent annual, taking into account the accomplished payments, and the growth rate of the country, practically void in the last decade. Its immediate consequence is the depletion of the investment process. The imperative need of not to continue with diverting resources allocated for the investment, on to interest payment, added to the impossibility to comply fully with the service of the external debt, compels to consider alternative management of the debt proposals, using the debt's important discounts in the secondary markets.

2. Genesis of the external debt.

In Argentina's indebtedness process can be distinguished: the acquisition stage of the debt, at negative real interest rate, which ends with the 1981-82 payments suspension; from the growth stage, by simple refinancing of the unpaid interest. In the first stage, when to contract obligations was inexpensive because the inflation paid the debt, the Argentine debt jumped from 9.7 billions to 40.7 dollar billions, in the period 1976-82. The inflection point coincides with the jump of the LIBOR rate -to which was stipulated the debt- from about zero percent, after to discount the inflation, in the years 70-80, up to real interest rates of the 4-6 percent order, in 1981-86. Concurrently, in 1987, the terms of the exchange had fallen a 30 percent, compared with the period 1980-84. After 1982, Argentina almost does not receive anymore fresh money. In 1990, the Argentine debt climbed to 60.4 American dollar billions. Regrettably, the acquired debt did not produce an equivalent increase in real investments in the country. It is estimated that 60.7 percent from the funds which came to the country during the period 1979-83 -about 22 dollar billions- it was apparently used to finance capital flows not declared abroad (Rodriguez 1986, 4).

3. Effects of the debt on the economic growth.

The Argentina, during the period of the Model Agro Exporter (1860-1930s) grew to the 6 percent annual. During the three later decades up to the 1950s, the rate is of the 3 percent, while in the 1980 decade the growth of the national revenue has been practically void. The most serious consequence of the debt crisis is that Argentina stopped its investments. More serious yet, the deterioration of investment efficiency results. In these circumstances, it should not astonish that the situation worsens as time goes by, compared with that of 1982. The Argentine government had to devaluate iterated times its currency, issuing, to acquire dollars which were transferred to the external creditors. This fact has twice pushed Argentina to the edge of the hyperinflation, promoting heedlessly the flight of national capital to the exterior. The debt problem, far from being solved, is aggravated by the unpaid interest accumulation.

4. Formulation of the Debt-Growth Model.

The model is composed of three differential equations, which rule, respectively, the dynamical behavior of the national revenue, the external debt and the market price of the latter. The first of the equations is a very simple interpretation of the growth process -though good enough for the purposes of this work- known as Harrod-Domar Theory of growth. One of the ideas behind the mentioned theory is an investment function, known as the acceleration principle, which is based on the hypothesis that the

wished investment depends on the demand level of the product which such investment creates. Or, simply, the net investment, or increase of the capital stock, it is linked to the growth of the national revenue. The accelerating coefficient v is defined as the capital-product relationship: $\Delta K = \Delta Y$. Supposing that the capital stock is not depreciated, the acceleration principle can be rewritten as: $I = v * \partial Y / \partial t$. On the other hand, the macro-economic balance condition requires that the aggregate planned investment be equal to the planned saving: $I = S$. Supposing that the saving be proportional to the revenue, the balance condition can be written as: $I = v * \partial Y / \partial t = s * Y$, which implies that $\partial Y / \partial t = (s/v) * Y$. Taking into account the external debt presence, a portion of saving should be allotted to the debt service. If, furthermore, it is admitted the capital devaluation, the resulting differential equation remains thus:

$$\dot{Y} = \frac{\partial Y}{\partial t} = \frac{s Y - K d - T}{v} \quad (1)$$

The second differential equation involves the external debt B , and regulates the accumulation of the unpaid interest. The said stock B acts as the countable sector of the model. The owing interest results from the differences which exist between the annual interest flow that is owed according to contract ($B * i$), and the annual payments T actually accomplished. If there is a quantity A of additional cash available to allocate to the purchase of the debt securities in the secondary market, the amount of the debt would decrease, in a quantity that it is inversely proportional to the price p of the same. The corresponding differential equation results then:

$$\frac{\partial B}{\partial t} = [(i * B) - T] - \frac{A}{p} \quad (2)$$

The meaning of these two first differential equations, in Systems Dynamics terms, is quite clear. The equation 1 is represented by nested negative and positive feedback loops which control the growth of the national revenue. They appear in the lower part of figure 1. The second differential equation -equation 2- is represented in the central part of figure 1 by a positive feedback loop, that makes the debt grow in so far as the interest of the same remains unpaid. Furthermore, purchases of the debt, exogenous respect of the loop, reduce the magnitude of the owing.

The third differential equation refers to the behavior of the debt price in the secondary market. According to Rodriguez (1990), the owner of a debt bond -whose contractual interest is represented by i and whose par value is a dollar- has two alternatives: either sells it or keeps it. Market's balance requires that the owner of the bond be indifferent to anyone of the two possibilities. If the owner sells its bond, whose nominal value is a dollar, at the market price p , and invests it at the rate i of the monetary market, purportedly equal to the contractual rate of the debt, receives an annual flow that it is equal to $(p * i)$. If, on

the other hand, the owner keeps its bond, he is beneficiary of the sum of three flows. In the first place, he receives, during the year, -by its bond whose nominal value is a dollar- a quantity that results from dividing the debt real service T by the number B of bonds which represent the total of the debt B . Such quantity should have been larger, according to the contracted rate. In the second place, he receives, also during the year, -instead of the unpaid interest- a quantity $(i-B/T)$ of new bonds of the debt, which sold in the market at the price p , will produce a funds flow that it is equal to $(1-B/T)$. Finally, the owner is benefitted also with contingent increases in the bond price that occur during the year: (dp/dt) .

The mentioned balance condition of the market demands that the return of the investment, in both cases, will be equal, supposing rational expectations, to perfect forecast. In such a case the following equation 3 is fulfilled.

$$i \cdot p - (T/B) + p \cdot (i - T/B) + \frac{\partial p}{\partial t} \quad (3)$$

From the equation 3 the following differential equation is obtained:

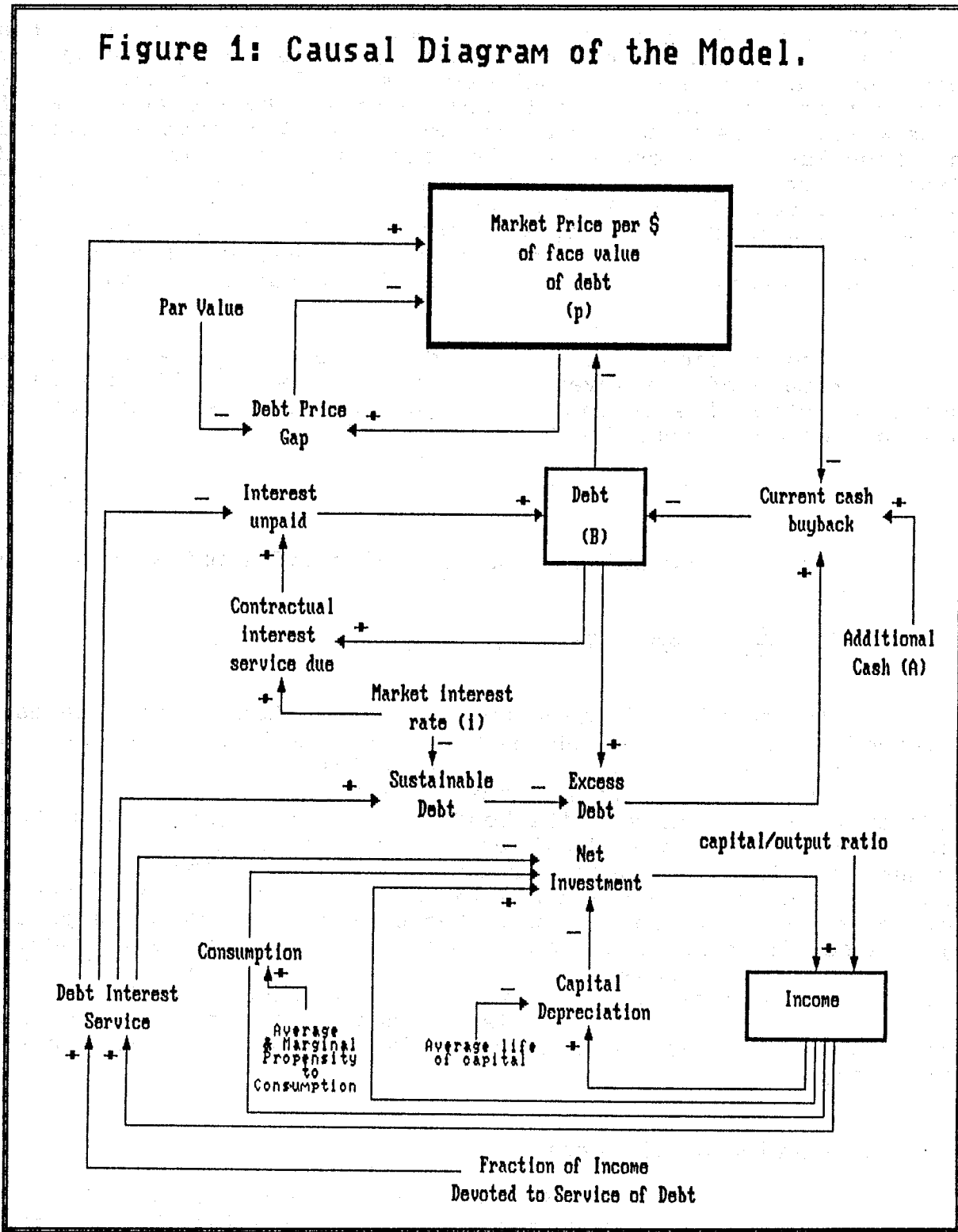
$$\frac{\partial p}{\partial t} - i \cdot p - (T/B) - p \cdot [i - T/B] = \frac{T}{B} (p - 1) \quad (4)$$

The meaning of the equation 4, in System Dynamics terms, is turned clearer if the subtraction $(p-1)$ is interpreted as the difference between the nominal and real value of a debt bond. Then, a price gap can be defined that accelerates the action of a feedback loop which acts on the bond price. The larger the gap, the quicker will fall the bond price in the secondary market. Furthermore, the bond price is affected by two others external factors to the loop: the amount B of the debt and the real service T of the same. It is obvious that the debt growth makes its price fall. Also, it is natural that larger services of the debt improve its price in the market. What it is not that obvious is the multiplying character of the relationships between B , T and the factor $(p-1)$. Such assumption is imposed on the model from the economic theory. This third equation is represented in the upper part of figure 1.

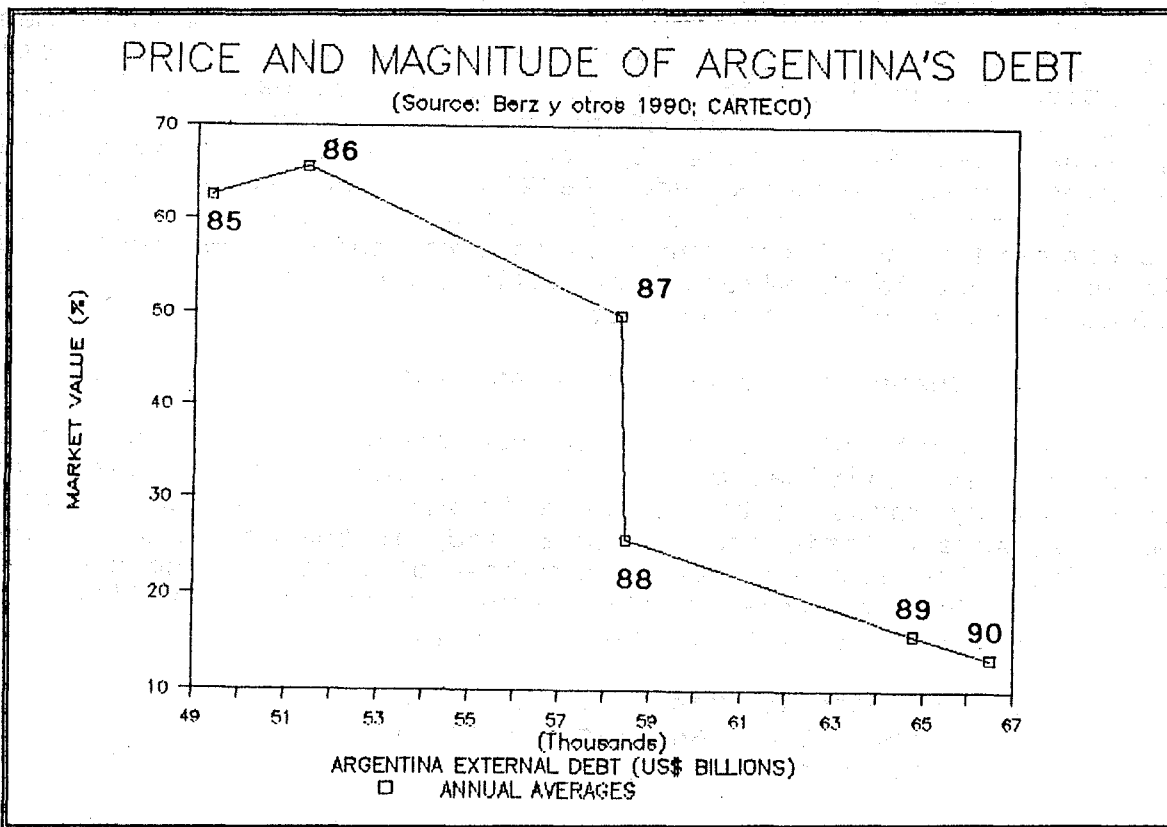
5. Confirmation of the model.

The available empirical data confirms what is anticipated by the outlined model, with regard to the behavior of the debt price in the secondary markets. In absence of repurchase debt programs, if the annual payments of the indebted countries do not reach thorough satisfaction of the external debt services, this will grow as time passes, simultaneously with the decrease of its price. In the case of Argentina, illustrated in figure 2, it is quite clear the deterioration process of its debt price.

Figure 1: Causal Diagram of the Model.



The purchase operations occur in secondary markets which are not formally organized. In the period about which there is known data regarding private operations of Argentine bonds, 1985-90, the external debt grew from 50 up to 60 billions of American dollars. Its price fell in the secondary market, from 62.5 percent in 1985, to 13.4 percent, in 1990.



2

6. Alternatives to the Economic Growth and Debt Management of Argentina.

Yet, in such a simple model - almost scholastic- as this which has been outlined here, it is possible to test policies in the double front of the development and of the indebtedness. With regard to the growth, it is urgent to improve the gain of the feedback loop which dominates the economic growth. This can be achieved, if there is a firm political decision to bend social resistances, improving the productivity and decreasing the tendency to consumption, until the historical levels of the long term are reached. With regard to the debt, the "snow ball" mechanism which dominates its growth should be dismantled. To pay half what should be paid drives to nothing, unless it be exposed perilously to hyperinflation. Therefore, bold measures should be tested, in order either to reduce the owing stock or to limit the services flow, or both simultaneously.

A) Extrapolation of the current trends.

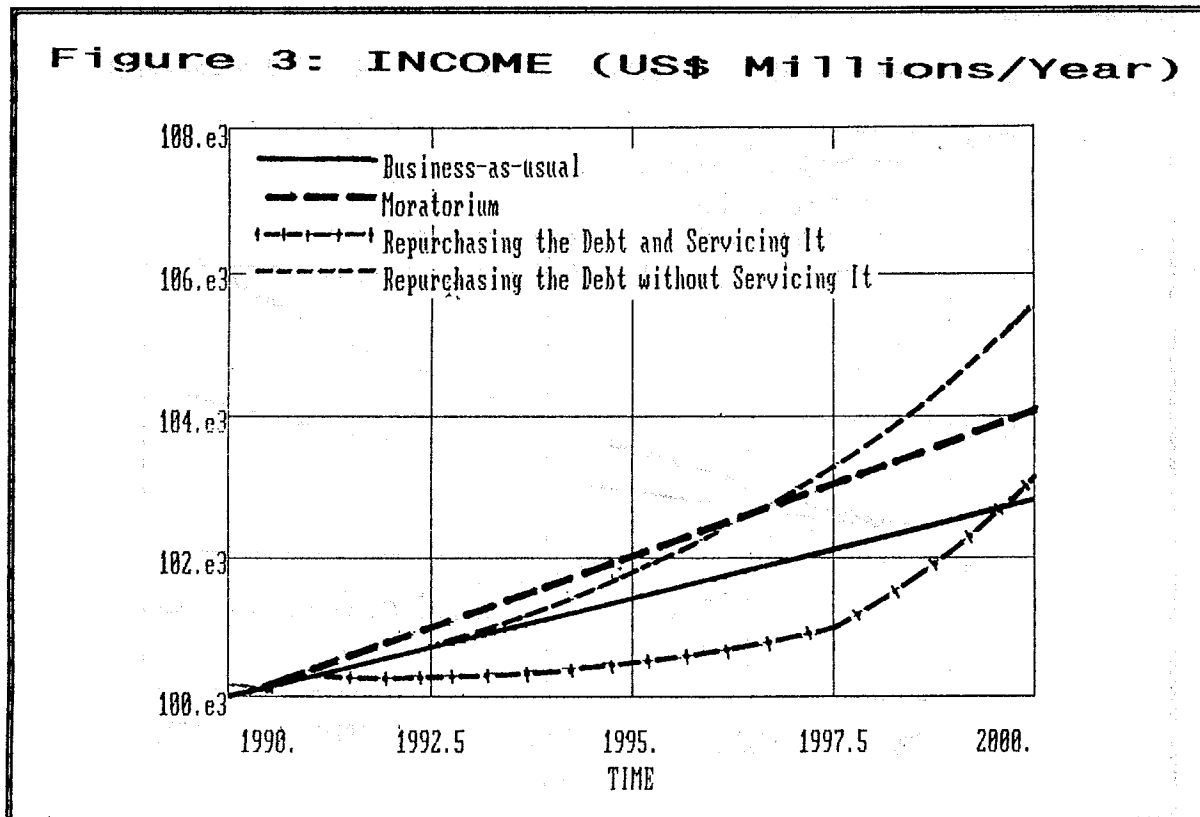
This scenario conserves the magnitude of the main parameters of the model, the nearest possible to the magnitude reached by them in the last years of the 1980 decade and produces zero growth of the national revenue. To follow through, the magnitude assigned to the parameters to generate the basic run of the model is mentioned. The marginal productivity of the investment is of the 4 percent order. Certainly, it is a very pessimistic assumption, but reflects the current Argentine situation. The level of the consumption is about 80 percent of the national revenue, magnitude that it is more typical of already industrialized countries, as the United Kingdom (83%) or United States of America (85%). In the five year period 1982-87, 55 percent from the interest paid to the Argentine creditors was paid by own resources. This amount equals to allocate annually 3 percent of the national production to service of the debt.

B) Suspension of the debt service.

In spite of the fact that constitutes an almost obliged slogan for some political customers, while the electoral campaigns elapse, nobody wants to break formally with the creditors. Apart from this, some politicians, being already in the government, have discontinued the debt service as a matter of fact, paying symbolic sums by its service. This usually happens when there is little to gain by the accomplishment of these obligations.

C) Increase of the Productivity, Decrease of the consumption and Repurchase of the Debt in the Secondary Market.

This scenario simulates the consequences of decreasing gradually the consumption, from 80 percent to 72 percent of the product, value that emerges from statistics estimates, for the long period (1950-1984). Such a magnitude is in line with those corresponding to recently industrialized countries, as Brazil (79%), Mexico 77, Korea (73%), Malaysia (71%), etc. Concurrently, it is supposed that the productivity of the investment improves, also progressively, recovering the historical average, 12 percent, of the long series 1951-1984. Gradually, seeing the irrefrenable deterioration of the debt, the creditor countries have opened the repurchase possibility of the external debt by the indebted countries, relaxing the accomplishment of the objectives pursued by the application of the "sharing clause" (Rodriguez 1990, 27). However, Rodriguez (1988, 1990) shows that the repurchase strategy only would be effective if the annual available money is superior to the part of the services that should be refinanced. But, if this occurs, the debt owners should be able to anticipate that the bonds will reach its par value in the future, thus, they would only sell the same at its nominal value. This would cause a jump of the bonds price in the markets, immediately after Argentina announces a repurchase program of the debt. The external debt, B, at the beginning of the simulation run, exceeds the bearable volume of the

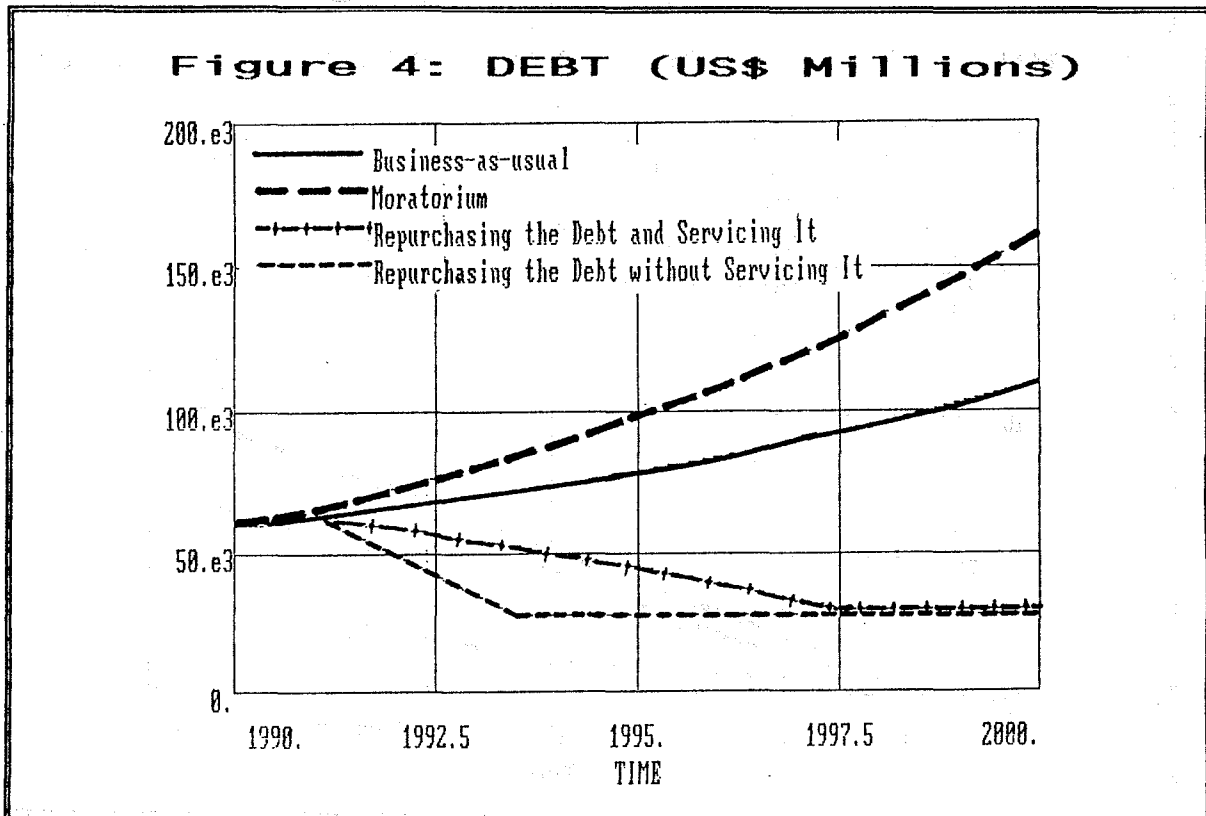


3

same. The said sustainable debt is defined as that stock ($B^* = T/i$), which is consistent with the flow T of funds that the indebted country is actually in conditions of paying, according to the stipulated rate i . The excess of the debt is defined as the difference between both. Any negotiation policy of the external debt, would have to aspire, at least, to annul such excess.

D) Improvement of the Macro-economic Dynamics, Repurchase of the Debt and Suspension of the Payment of the Services.

This scenario simulates the same decrease of the consumption and the same increase in the productivity that occurs in the previous one. Furthermore, it supposes amortization of the principal without interest payment. Fernández (1987) warned that the countries which impel capitalization proposals of the external debt, would not be benefitted from a contingent generalized condonation of the debt and, furthermore, they should not use the gap between the nominal value and the market value, since such capitalization programs accept the debt at its par value. Because of this Fernández proposed to allocate the whole commercial balance to repurchase the owing capital, at market prices, without servicing the expired interest, which have to be refinanced. The factors that intervene in the definition of the change rate of the market price act as multipliers, as is observed in the equation: $dp/dt = (T/B) * (p-1)$. Therefore, the annulment of some of the factors,



4

In this case, the price of the debt titles stay intact, in the level that possessed before the application of such program. If this policy is applied for very low levels of the debt price, as the Argentine case is, it can be quickly repurchased, in order to reach the sustainable debt level, B^* . When such a thing occurs, the repurchase program of the debt is discontinued and the service of the same is resumed. This strategy tends to solve the debt problem in the shortest possible term.

7. Consequences on the Economic Growth.

Argentina does not reverse significantly its decadence process (see figure 3). The policies designed to increase the productivity and to reduce the consumption almost achieve to overcome the void growth of the previous decade. In the best case the economy only achieves to grow a 0.5 percent annual. It does not reach to accompany the vegetative growth of the population. The consumption by inhabitant declines in all the cases, between 13 and 10 percent approximately in the decade, because of the fact that the population grows at an annual net rate of the 1.65 percent. It is interesting to underline that to continue doing as up to now: paying half the debt service, it does not stop the indebtedness and the country continues without growing. To solve nothing results rather expensive. Yet, it is a scenario that tends to be maintained.

The efficiency of the repurchase policies of the debt is remarkable (see figure 4). In the case of repurchase without suspension of the services, the debt falls gradually, and is reduced to half the amount, in the decade. This generates smaller service, which compensates the extra effort required by the repurchase program. The objective reached, the country begins to grow again. From the political point of view, the country has to sustain almost the same decrease of the revenue by inhabitant, 12 percent in the decade, in the basic stage, with the advantage that to the end of the decade, the economy can turn to grow. If there is repurchase with services suspension, the same almost occurs, but more rapidly.

REFERENCES.

Fernández, R. 1987. Negociación y capitalización de la deuda externa argentina. *Serie Documentos de Trabajo del Centro de Estudios Macroeconómicos de Argentina*. 57.

Rego, J., Vega, J. 1988. Probabilistic Generation of Scenarios for Argentina, using an Elemental Harrod-Domar Model of Growth. *System Dynamics: An International Journal of Policy Modelling*, 1(1):32-42

Rodriguez, C. 1986. La deuda externa argentina". *Serie Documentos de Trabajo del Centro de Estudios Macroeconómicos de Argentina*. 54

Rodriguez, C. 1988. Un análisis teórico sobre la recompra de la deuda en mercados secundarios. *Serie Documentos de Trabajo del Centro de Estudios Macroeconómicos de Argentina*. 63

Rodriguez, C. 1990. Managing Argentina's External Debt: The Contribution of Debt Swaps. *Serie Documentos de Trabajo del Centro de Estudios Macroeconómicos de Argentina*. 68.