OECD DEVELOPMENT CENTRE

Working Paper No. 177
(Formerly Technical Paper No. 177)

EXTERNAL SOLVENCY, DOLLARISATION AND INVESTMENT GRADE: TOWARDS A VIRTUOUS CIRCLE?

by

Martin Grandes

Research programme on:
Governing Finance and Enterprises: Global, Regional and National

OECD OCDE

June 2001
CD/DOC(2001)9

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

I would like to express my gratitude to Osvaldo Kacef, Julio Nogues and ISEG's staff for their unconditional support. I also wish to acknowledge Helmut Reisen, Daniel Cohen, Colm Foy, William Branson, Marcelo Soto, Laura dos Reis, Lior Zima, Juan Carlos Barboza and all the participants of an internal seminar at the OECD Development Centre for their helpful comments towards enhancing my research conclusions.

PREFACE

Repeated currency crises and intensifying globalisation of portfolios, investment and production have left adjustable peg exchange-rate systems discredited, leading towards either more nominal exchange-rate flexibility or hardened pegs. Work at the Development Centre in this field has demonstrated the role of the exchange-rate regime in obtaining long-term credibility for financial systems. In Latin America, Argentina has been an early mover, leaving behind a hyperinflationary history and adopting a currency board system that has firmly pegged the peso to the dollar. While the currency board has been instrumental in overcoming inflation, and while it initially helped to spur growth in Argentina, recent years have seen it transformed from panacea to straightjacket, as the country became subject to heavy external shocks. Martin Grandes, from Argentina's Ministry of Economics, investigates why.

Grandes shows that one of the major hopes of a currency board — heightened investment and growth through lowering yield spreads on the foreign debt — ultimately failed to materialise because lower devaluation risk was more than compensated for by higher default risk. The discipline exerted by the currency board was not strong enough to back the structural and fiscal reforms that could have avoided the unpleasant arithmetic of rising debt cost and low growth. The lesson of this paper is that external solvency should be strengthened directly through structural reform, fiscal management and export promotion rather than indirectly by importing policy credibility from abroad. This paper is part of the Development Centre's research activity *Governing Finance and Enterprises: Global, Regional and National* in the 2001-2002 Programme of Work. Its findings have added empirical content to the forthcoming Development Centre volume entitled *Don't Fix, Don't Float*, which I have edited together with Centre colleagues Daniel Cohen and Helmut Reisen.

Jorge Braga de Macedo
President
OECD Development Centre
June 2001

RÉSUMÉ ANALYTIQUE

Au cours des années 90, du fait de l'augmentation conséquente de la part des économies émergentes sur les marchés de la dette en devise, le risque-pays associé à ces économies est devenu un sujet de préoccupation croissant lors de l'émission de nouveaux titres obligataires ou du rééchelonnement de créances non honorées. Toutefois, comme le montre l'histoire récente, la volatilité financière a eu tendance à rendre ces pays plus vulnérables aux effets de contagion et aux crises de la balance des paiements. En conséquence, les investisseurs internationaux en obligations ont exigé un relèvement de la prime de risque afin de compenser le ratio risque-rendement. Plusieurs solutions relatives aux taux de change ont été proposées pour réduire la vulnérabilité de ces marchés aux chocs extérieurs : la dollarisation par exemple. L'un des principaux arguments avancés par les tenants de la dollarisation est la diminution attendue des écarts souverains, le risque monétaire ayant disparu. Selon cette vision « optimiste » — qui prévoit également un effet de retombée renforçant la crédibilité — une telle diminution pourrait tout à la fois améliorer la solvabilité et favoriser la croissance économique. Au contraire, les « pessimistes » mettent l'accent sur des mesures politiques visant à améliorer la compétitivité et à faire avancer les réformes structurelles.

Ce Document technique éclaire ces questions fondamentales à partir de l'examen du cas argentin. Il commence par montrer que les bénéfices d'une réduction des taux d'intérêt sur la dette libellée en dollars seraient limités et incertains : seule la dette en pesos (soit une part restreinte des encours totaux) profiterait de façon sûre d'une baisse des écarts. En outre, la vulnérabilité externe et budgétaire de l'Argentine s'est nettement accrue entre 1994 et 1999, et cette donnée a été prise en compte dans les notations et les écarts. Ensuite, la dollarisation ne semble pas la meilleure mesure envisageable pour améliorer la discipline budgétaire et encourager les réformes structurelles. Enfin, les auteurs montrent à l'aide d'une analyse économétrique d'autorégression vectorielle sur la période considérée qu'il existe une relation endogène certaine entre la croissance du produit intérieur brut, le déficit budgétaire et le risque-pays. Selon les résultats de cette analyse, outre la dollarisation, d'autres types de mesures permettraient de renforcer la solvabilité, telles que les réformes structurelles, la promotion des exportations ou l'amélioration de la gestion budgétaire.

ABSTRACT

Due to the substantial rise in the share of Emerging Markets (EM) in foreign-currency debt markets during the nineties, country risk in EM has become an issue of increasing concern for both new bond issues and rescheduled non-performing loans. However, as recent episodes show, financial volatility has tended to leave those countries more prone to contagion effects and balance-of-payments crises. Consequently, international bond investors have required higher risk premia to balance the risk-return equation. In order to make Emerging Markets less vulnerable to external shocks, exchange-rate corner solutions such as dollarisation have been proposed. One of the main arguments put forth by the dollarisation supporters is the expected decrease in sovereign spreads, as currency risk will no longer hold. According to this "optimistic" view, which also relies on a credibility spillover effect, such a decrease could begin improving solvency weaknesses while boosting economic growth. "Pessimists", on the other hand, have emphasised alternative policies focused on improving competitiveness and pushing forward structural reforms.

This paper aims to shed some light on these crucial issues through an examination of the Argentine case. First, it will show that the benefits of reducing dollar interest rates would be limited and uncertain: only peso debt — a minor part of total liabilities — would yield safe lower spreads. Second, Argentine external and fiscal vulnerability sharply worsened from 1994-99, a fact that has been taken into account by ratings and spreads. Third, dollarisation does not seem to be a first best policy to improve fiscal discipline and push forward structural reforms. Finally, it will show through an econometric VAR analysis for that period that a meaningful endogenous relationship between gross domestic product growth, fiscal deficit, and country risk holds. Results of this analysis suggest that, irrespective of dollarisation, there might be other policies to strengthen solvency, e.g. structural reform, export promotion or better fiscal management.

I. INTRODUCTION

Since Brazil's real devaluation (January 1999), which entailed the abandonment of a pegged exchange-rate regime in that country, Argentina has reconsidered dollarising the economy as a way to cushion external shocks. Both the contagion of Brazil's crisis and the Russian default (August 1998) have revealed Argentina's severe external vulnerability. This feature might be explained by the fact that the Argentine economy has been highly prone to financial contagion, increasingly dependent on capital inflows, and its export performance closely linked to Brazil's markets.

The advocates of dollarisation (Calvo, 1999 and 2000; Hausmann and Powell, 1999; Stein *et al.*, 1999; Schuler, 1999, among others[1]) suggest that regarding initial conditions at the balance sheet level of a fixed exchange-rate economy (liabilities, dollarisation, and currency mismatches), currency policy is ineffective in restoring external equilibrium after a shock. Moreover, they argue that, compared with exchange-rate changes, deflation could provide an alternative, less costly adjustment mechanism.

There is also a vast literature on topics such as seignorage sharing, lender of last resort, volatility or optimal currency area (see, for instance, Barro, 1999; Calvo, 1999 and 2000; Sturzenegger and Levy Yeyati, 1999; Eichengreen, 1998). Yet there are still some issues that have not been sufficiently explored. Given the importance of external and fiscal constraints in emerging economies, and the relative weight of these constraints in sovereign ratings and bond spreads determination (and vice versa), can dollarisation make an economy less vulnerable? In other words, does dollarisation help or hinder the reduction of emerging-market spreads on the global bond market?

The paper is organised as follows:

Section II describes a simple theoretical approach to disentangling the quantitative and qualitative features of local/foreign currency denominated asset equilibrium interest rates.

Section III provides a critical discussion on the literature concerning country and currency risks, focusing on the Argentine case (Rubinstein, 1999; Nogues and Grandes, 1999; or Berg and Borenzstein, IMF 2000; among others), comparing econometric outcomes and methodologies. This issue deserves special attention, as interest rate-reductions are one of the most significant gains expected from dollarisation.

Section IV makes a brief review of the latest reports on sovereign ratings released by rating agencies such as S&P and Moody´s in the Argentine case. In doing so, it discusses how the rating agencies identify areas of concern and policies to improve a country's solvency, irrespective of dollarisation devices. Furthermore, it looks into external vulnerability ratios to draw a clear picture about Argentina's perspectives.

Finally, as the current Argentine government policy relies upon the virtuous circle between country risk, growth expectations and fiscal deficit — in turn closely linked to debt rollover — Section V explores the dynamics of these variables using a VAR approach in a time series framework.

A last section sums up the main ideas discussed throughout the paper and provides some concluding remarks.

II. THEORETICAL FRAMEWORK

The basic assumptions are those of a typical assets model within a general equilibrium approach:

— A small open economy, with highly mobile capital and a fixed exchange rate (or currency board, for the Argentine case).

— There are three assets: bonds, real cash balances and foreign currency. Assets are imperfect substitutes.

— Goods, money and labour markets are in equilibrium.

— If assets markets are in equilibrium and there is no credit rationing, the following arbitrage condition (uncovered interest parity) holds:

$$I = I^* + \hat{e} + ERP + \rho\ (.)$$

where:

I is the nominal local currency-denominated bond yield, I* is the nominal foreign currency-denominated bond (UST, for instance) yield, ê is the expected change in the spot exchange rate, equal to $(e_{t+1}-e_t)/e_t$ with e as the expected spot rate for period t+1, and e_t being the current fixed rate set by the government. ERP implies the exchange risk premium equal to FD (forward discount rate) minus ê; in what follows we will refer to CR = ê + ERP as the currency or devaluation risk[2], whereas ρ (.) represents the sovereign risk premia[3]. The spread involves economic/financial solvency or liquidity assessments as well as other concerns such as political stability and defaults history.

— If bonds are issued in foreign currency, then CR =0 so that $I_{US\$} = I^* + \rho\ (.)$;

— Given ρ (.) might include some of the same factors determining the level of CR (e.g. vulnerability ratios), sovereign risk premia could rise if those factors worsen.

— Empirically, there seems to be a close link between market-determined spreads and sovereign ratings reported by well-known agencies, even though ratings do not change as quickly as bond prices (implicit return). See Reisen and von Maltzan (1999), Haque *et al.* (1998) or Cantor and Packer (1996).

The foregoing settings implicitly assumed that nominal and real interest were equal, either with no inflation or equal inflation rates among countries. However, this is not the usual case for dollarising countries[4], so real interest rate differentials may be decomposed as follows (see Frankel, 1989)[5]:

$$R - R^* = (I - I^* - FD) + (FD - \Pi_e + \Pi^*_e)$$

where R refers to real interest rates, FD is the forwards discount rate on domestic currency (future markets) and Π_e the expected inflation rate.

The first term on the right-hand side of the equation is the country premium or deviation from covered interest parity (owing to political matters, fiscal solvency, transaction

costs and/or default risk of sovereign nations) and the second one is the currency premium. Going one step further, an additional decomposition becomes apparent in the last term. This implies a two-fold analysis, exchange risk premium plus expected real depreciation, namely:

$$FD - \Pi_e + \Pi^*_e = (FD - \hat{e}) + (\hat{e} - \Pi_e + \Pi^*_e)$$

The Frankel decomposition is more useful when looking at a flexible exchange-rate regime. Within a currency board, given a non-devaluation precommitment, economic agents know that ê will be near zero, unless a regime switch occurs. Supposedly, this event would be captured by forward rates. Furthermore, deviations from relative purchasing power parity — different inflation rates not validated by exchange-rate depreciation/appreciation — would in fact bring about wider differences in real interest rates. Otherwise, price or wage adjustment mechanisms should lead to PPP levels.

III. EMPIRICAL EVIDENCE ON SOVEREIGN SPREADS AND CURRENCY RISK

The empirical underpinnings of the dollarisation debate imply at least three seldom tested questions: *a)* How is devaluation risk measured and how is the expected exchange rate forecasted? *b)* Is there any causality between country and currency risks? *c)* What kinds of estimations have been made to assess the direct or indirect effects of eliminating currency risk on country risk spreads? We will examine these questions more closely, paying particular attention to the estimation methods as well as their shortcomings. Basically, four recent contributions will be discussed, namely, Rubinstein (1999), Frankel (1999) Nogues and Grandes (1999) and Berg and Borenzstein (2000). These publications make up the core of the evidence found for the spreads-currency risk link in Emerging Markets, mainly Argentina. The overall conclusions are:

— There is no accurate fashion to compute currency risk.

— It is only by assuming causality from currency risk towards sovereign spreads — which implies ignoring endogeneity or simultaneity problems, among others — or values for expected devaluation and currency crisis probability, that it can be known how much spreads would diminish.

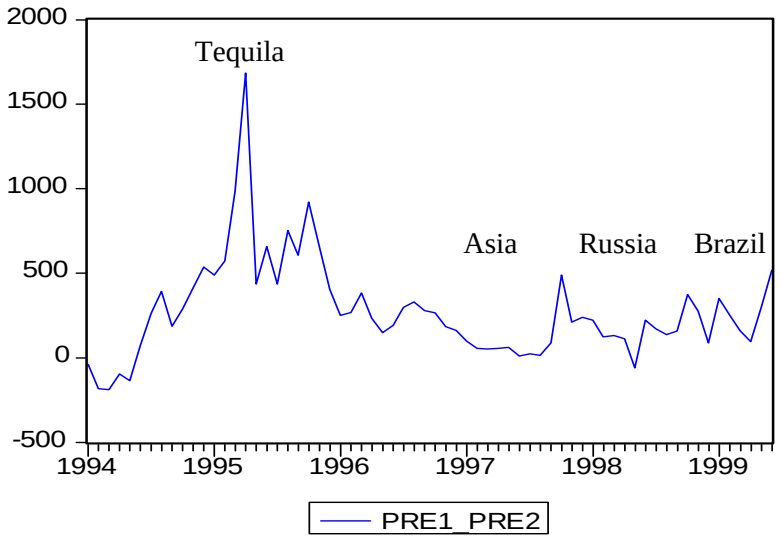
— The meaningless and scarce peso-denominated foreign debt in international markets has led the authors to take dollar bond spreads to calculate potential gains drawn from eliminating currency risk. Notwithstanding, they would not be computing indirect gains arising from such factors as credibility effects, as those bonds do not have currency risk, by definition.

— Even so, determining definitively whether it is the reduction in default risk or currency risk that brings down total sovereign spreads would be impossible, as common factors explain short-run movements of both variables.

a) Measuring Devaluation Risk

Both Rubinstein (1999) and Berg *et al.* (2000) employ the spread differential between Argentina's pension debt "PREVISIONAL1" (PRE1) and "PREVISIONAL2" (PRE2)[6], where PRE1 is a peso-denominated bond and PRE2 a dollar bond. Indeed, Rubinstein (1999) builds an indicator based on a transformation of the original spreads, and equal to (((1+Pre1)/(1+Pre2)) –1)*10000). Spreads account for the differential return required from investors to hold peso-denominated assets instead of dollar assets. The figure below depicts the PRE1-PRE2 series from January 1994 to June 1999, a period during which many financial crises occurred (Tequila shock, Asia, Russia and Brazil are indicated).

Figure 1. **Spread of Peso over Dollar Bonds, Argentina**
Basis Points

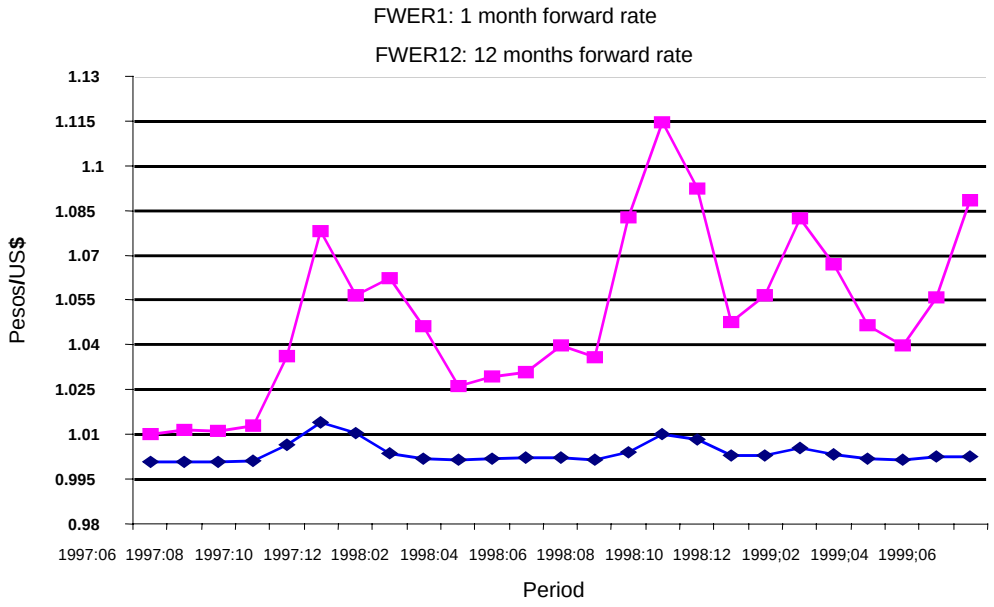


As a proxy measure of currency risk, PRE1-PRE2 is not without shortcomings. In Nogues and Grandes (1999), it was argued that the default risk implicit in those bonds would not be the same, especially when considering possible devaluation[7]. Even assuming equivalent associated political or financial risks, if the currency were devalued, the repayment of PRE2 capital plus interest could turn out to be more difficult than PRE1. The less tax revenues are dollarised, the more serious this discrepancy, which seems to be the case for Argentina's fiscal system.

Another way of dealing with currency risk would simply be to take the forward exchange rates quoted in Wall Street future markets. These quotes might perform better than PRE bond differentials because although trade volumes are limited, exchange rate quotes capture expectations about the exchange rate in a more genuine fashion. Figure 2 plots the forward exchange rates provided by JP Morgan from June 1997 to June 1999.

Figure 2 suggests that the 12-month market is the forward market that best reflects expectations, as uncertainty is higher for a longer period. The problem with forward exchange rates is that we do not have available data for the years before 1997, so that the econometric analysis is limited to a short sample. By contrast, it has the advantage of being exogenous and not simultaneously determined when compared to PRE's default risk.

Figure 2. **JPMorgan's Forward Exchange Rates**



b) Is There any Causality Between Sovereign and Currency Risk?

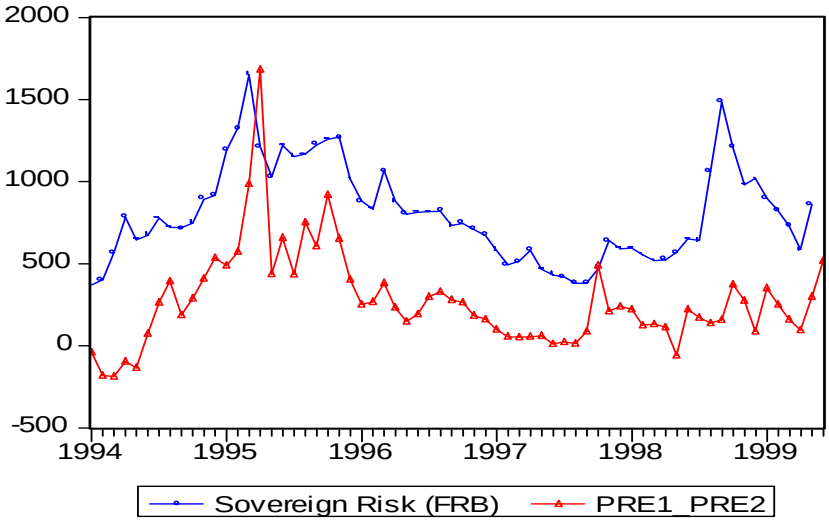
Recalling the classical arbitrage condition just exposed above:

$$I = I^* + CR + \rho\ (.)$$

Moving one step further, it is possible to regroup the second and third term on the right hand side of the equation, summarising them say in ω ("total sovereign risk"). Likewise, ω could be divided into some "pure" default risk (ρ) and the remaining risk corresponding to the event of a change in the exchange rate (CR), both weighted for their respective likelihood. It is then possible to investigate the incidence of CR on ω.

The first problem that arises is the following: if it is assumed that the arguments of ρ are the same as CR, this might result in an endogeneity problem, in addition to the simultaneity that occurs when measuring CR through bonds that already entail their own default risk. In other words, the observed correlation (Figure 3) between ρ and CR (measured by PRE bonds differentials) might be due to common factors. For example, a global flight to quality or contagion effects would cause both spreads to go up (see Nogues and Grandes, 1999, for empirical proof, or Berg *et al.*, 2000, for a conceptual discussion). Therefore, the residuals of OLS regressions between both risks would not support the assumption of no correlation with respect to explanatory variables. Instrumental variables could be used to work out this relationship, by devising estimation methods like Seemingly Unrelated Regressors (SUR). Again, finding a proxy for CR is not an easy task.

Figure 3. **Sovereign and Currency Risks, Argentina**
Basis points



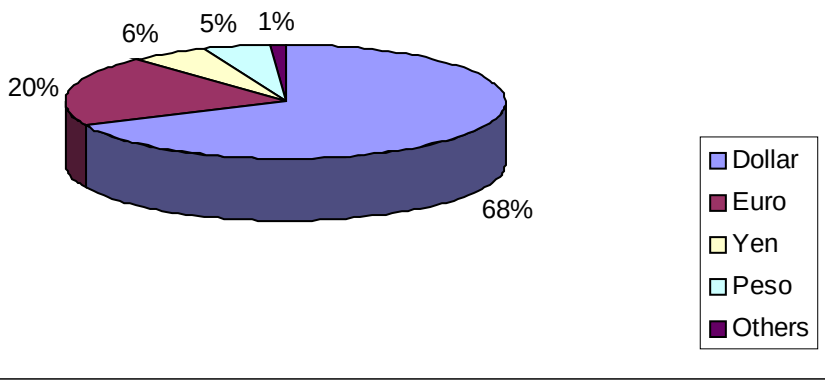
A second problem is that even assuming causality from currency risk to sovereign spreads, in a time series approach (for the Argentine case 1994-98) Granger-causality tests seem not to validate the null hypothesis. This test does not necessarily mean economic causality but instead indicates temporal precedence in a forecasting analysis (Nogues and Grandes, 1999), especially in a VAR approach.

As long as any causality holds, it is worth looking into responses of sovereign spreads due to changes in currency risk. The following section takes up that discussion.

c) Estimating The Effects of Lowering Currency Risk.

In order to assess the effects of dollarisation policy, one crucial point is to know how much of ω (total sovereign risk) is explained by CR (currency risk). To deal with the former, two main research lines have been proposed. The first one is based on econometric time series modelling (Frankel, 1999; Rubinstein, 1999); the second focuses on probability experiments (Berg *et al.*, IMF, 2000). These exercises work only for peso-denominated bonds as explained in the theoretical framework. A controversial issue arises here from the fact that most Argentine foreign debt is dollar or euro denominated (88 per cent) and peso bonds are primarily short-term commitments (5 per cent) (Figure 4).

Figure 4. **Total Public Debt: Currency Denomination**



Source: Ministry of Economy, Argentina.

Frankel (1999) points out that the advantages of dollarisation — first thought of unilaterally — should show up in a reduction of country spreads, supposedly due to lower capital flow volatility resulting from the disappearance of currency risk. In this regard, he estimates an Ordinary Least Squares (OLS) regression of PAR[8] bond yields against US Treasury (UST) bond returns, concluding that Panama — already dollarised — has almost half the response of Argentina PAR yields when UST yields increase. One of the shortcomings of the former estimates is the lack of other controlling variables which might also explain volatility. In fact, there is no reason to suppose that contagion effects disappear merely through dollarisation.

Rubinstein (1999) runs another OLS regression to assess the impact of currency risk increases (measured as explained in Section IIIa) on sovereign spreads, this time performed by JP Morgan's Emerging Markets Bond Index+ for Argentina (EMBIAR+). In a first unrestricted model, he found that for each 100 basis point increase in currency risk EMBIAR+ goes up by 152 basis points. Nevertheless, clear-cut serial correlation appears not only in the equation above but also in another restricted model estimated by the general to specific method, with distributed lags in both variables (see Rubinstein, 1999, appendix B). The best fitted restricted equation was estimated once again with the same data, finding slight differences in the coefficient's magnitude and the opposite expected sign of the second difference in EMBIAR+ (Table 1). Moreover, residuals from those models seem to display an ARCH (1) pattern, as the corresponding test rejects the null hypothesis of no autoregressive conditional heteroskedasticity.

Table 1. **Rubinstein Restricted Model**

Dependent Variable: EMBIAR+
Sample (adjusted): 1995:03 1998:12
Included observations: 46 after adjusting endpoints

Variable	Coefficient	Std. Error	T-Statistic	Probability
Currency Risk	0.810178	0.199998	4.050933	0.0002
EMBIAR + (-1)	0.483081	0.113474	4.257205	0.0001
DEMBIAR + (-2)	-0.265729	0.121349	-2.189785	0.0341
C	158.3072	50.02828	3.164355	0.0029
R-squared	0.882817	Mean dependent var.		769.7174
Adjusted R-squared	0.874447	S.D. dependent var.		344.2900
Durbin-Watson stat.	2.086748	Prob(F-statistic)		0.000000

Source: re-estimations since Rubinstein (1999) results.

The second approach to estimating how eliminating currency risk (CR=0) would reduce total sovereign spreads (ω) consists of assessing the default probability of Argentine debt once the devaluation event is deduced. To do so, Berg *et al.* (2000) have introduced a methodology to calculate such probability, as follows:

$$P\ (d/ncc) = (d- p\ (d/cc)* p\ (cc))/ (1-p\ (cc))$$

where p (d/ncc), p (d/cc) and p (cc) are respectively: the probability of default if no currency crisis occurs, the probability of default if a currency crisis does occur, and the probability of a currency crisis taking place; d is the total probability of default.

The authors devise and estimate this likelihood by assuming, first, that $d = (I^{\$}_{a} – I^{\$}_{us})/(1+ I^{\$}_{a})*(1- \alpha)$, $I^{\$}_{a}$ with $I^{\$}_{us}$ being the dollar interest rates of Argentina's Global bond and US bonds, respectively, whereas α is the recovery percentage of Argentine bonds if default occurs. Second, the likelihood of currency crises is calculated as p (cc)= (PRE1-PRE2)/ (1+ PRE1)* ê. Since there are no estimates for either ê, or p (d/cc), this methodology relies on sensitivity analyses, making assumptions for both values. For instance, if ê=20 per cent and p (d/cc)= 30 per cent, the reduction in spreads due to currency risk disappearance could be roughly 271 basis points. The higher the expected ê, the lesser will be the benefits from such reduction, as investors will have included this risk in the returns required.

The observations made in Section IIIa hold for this approach as well with respect to data quality and α values in the event of devaluation. Moreover ê and p (d/cc) can not be entirely independent since they rely to some degree on the way investors form their expectations. Furthermore, Berg *et al.* (2000) explicitly take other shortcomings related to bond maturities or life homogeneity into account. Escude *et al.* (2000) note another flaw concerning risk neutrality. Once risk aversion is taken into account by adding a risk premium to the expected return on both dollar and peso assets, dollarisation produces lower reductions in spreads, on average 20-25 per cent less. The gain size depends once again on the magnitude of the expected devaluation and p (d/cc), the probability of default in case a currency crisis occurs.

IV. DOLLARISATION, EXTERNAL VULNERABILITY AND RATINGS

It is well known that ratings assigned to countries issuing sovereign debt are crucial determinants not only of interest rates or spreads levels but also for investors' perception. This fact tends to be biased towards bad news announcements (see Larraín, Reisen and von Maltzan, 1997). Indeed, primary and secondary markets trading for emerging countries as well as the pricing process involved hinge on investors' expectations.

Although sovereign ratings influence country allocation in portfolios, sovereign spreads ultimately depend on a certain group of variables connected with solvency, liquidity, default performance and political risks, among others (see Kiguel and Lopetegui, 1997, for a cross country analysis, Nogues and Grandes, 1999, for a time series approach, or Reisen and von Maltzan, 1999).

Despite not changing as rapidly as spreads, ratings and outlooks signal markets about the expectations on future prospects of sovereign economies. Strictly speaking, the signalling attempts to provide an ongoing assessment of capability and willingness to repay. Of course, sometimes those expectations may mislead bond pricing, as in the Asian crisis, where most rating agencies failed to foretell financial or external vulnerability trouble. It is worth noting that often, ratings also entail a certain bias and sometimes simply support past market events.

As for Argentine ratings, which factors account for weaknesses hindering the upgrading to non-speculative standards?

In September 2000, Argentina was rated BB- and B+ by Standard and Poor's (S&P) and Moody's, the top agencies in the financial world. Those ratings are two and four steps below investment grade, respectively. In addition to the impact on secondary markets, upgrades toward investment grades would bring about lower interest rates on new bond issues and open the market to a wider range of institutional investors. At present, Argentina's long-term debt is yielding, on average, 300 or 400 basis points above other investment grade emerging markets such as Mexico or Panama (fully dollarised) (Table 2).

Table 2. **Emerging Market Ratings and Spreads**

Country	2nd Semester 2000		
	Ratings		EMBI+
	S & P	Moody's[9]	Spread (basic points)
Poland	BBB+	BBB+	258
Panama	BB+	BBB+	434
Mexico	BB+	BBB-	353
Argentina	BB-	B+	736
Brazil	BB-	B+	730

During 1999-2000, these agencies revised Argentina's ratings. In fact, Moody's decided to lower it from Ba3 to B1 before the new authorities took office by December 1999, whereas S&P revised its outlook upwards from a negative to a stable perspective in February 2000, but then downgraded to BB- by the end of the same year. Let us examine the reasons behind Moody's decision:

On the one hand, Moody's stated that

> "given the country's already heavy debt servicing requirements and its dependence on external finance for refinancing foreign currency-denominated debt, the medium-term credit risk has increased sufficiently to warrant slightly lower ratings... The new ratings implicitly incorporate the significant challenges that the next administration[10] will face on the fiscal front. Moody's noted that a significant fiscal adjustment would be required if the new government wishes to insure sustainable reductions in both the government's budget deficit as well as the public sector's overall financing requirement." (Moody's, 1999).

On the other hand, S&P modified the outlook because "*Argentina has regained the momentum to pass and implement needed fiscal and structural reform"* (S&P, 2000)*.* Pushing forward laws concerning fiscal equilibrium — including tax reform, and changes in fund distribution with provinces — undoubtedly improved expectations among investors[11]. However, insofar as *"government's fiscal flexibility is constrained by a rigid expenditure structure…and an unsupportive judicial system hinders tax collection"* (S&P, 2000)*,* structural flaws in public finances remain*.* In S&P views, the ratings are also constrained by Argentina's heavy external debt and debt service burdens, connected in turn with the lack of competitiveness they deem binding. Hereupon the problem arises when they compare Argentine ratios with other countries holding the same rating, finding much higher values for Argentina. Argentine ratios are twice or three times the level of the medium value for a BB- sovereign. However, it is important to look not only at the indicator level but also its trend in recent years, as an upward trend could signal additional vulnerability in the future.

Whether or not the agencies' analysis is correct is subject to discussion. There has been widespread debate regarding the fairness of Argentina's rating. On one side, some economists argue that agencies are more reluctant to upgrade sovereign nations than in years past, due to lessons learned from the experience in South East Asia. Moreover, some remark that they are now underestimating economic performance of countries pegging their currencies to the dollar, as the fear of an overvaluation in the real exchange rate followed by a currency crisis persists. This is supported by the upgrading of Mexico ratings to investment grade, as announced by Moody's during the first weeks of March 2000[12]. Another reason given is that the revision of national and balance-of-payments accounting systems — recently carried out in Argentina — might have undermined external/fiscal indicators (see Nogues, 2000), leading to a less favourable outlook in terms of vulnerability.

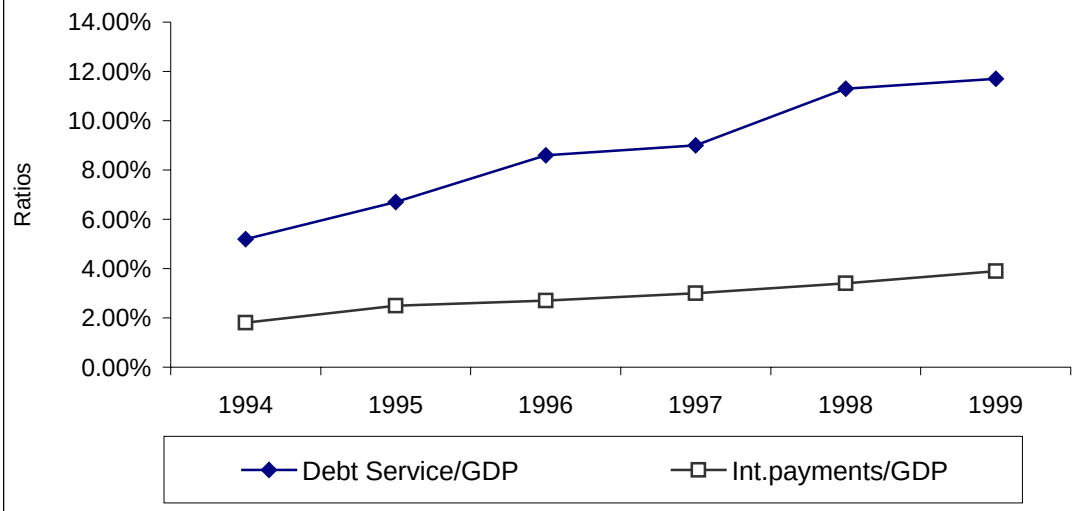
In the agencies' view, Argentina's rating upgrade is hindered by fiscal and external vulnerability, given its outstanding currency board regime. Consequently, gaining competitiveness or strengthening the fiscal stance might be a way of overcoming this disadvantage[13].

All in all, how important has the vulnerability problem in Argentina been in recent years? Might dollarisation bring a substantial improvement in external vulnerability?

Tackling the former question will involve examining some leading indicators whose level and/or growth rate could signal likely external crisis. It is worth noting that most of them come from theoretical approaches dealing with currency crises (e.g. Kaminsky *et al.*, 1998; Berg and Patillo, 1999; Lehman Brothers, 1999). Basically, we use four groups of indicators. In Figure 5, we compare debt service burden (interest plus capital accrued) to GDP. Then, Figures 6 and 7 depict debt service burden to exports (goods –X- or goods and real services -XTOT). Figure 8 performs a slightly modified version of Lehman Brothers liquidity indicator, which measures the relationship between goods and real services

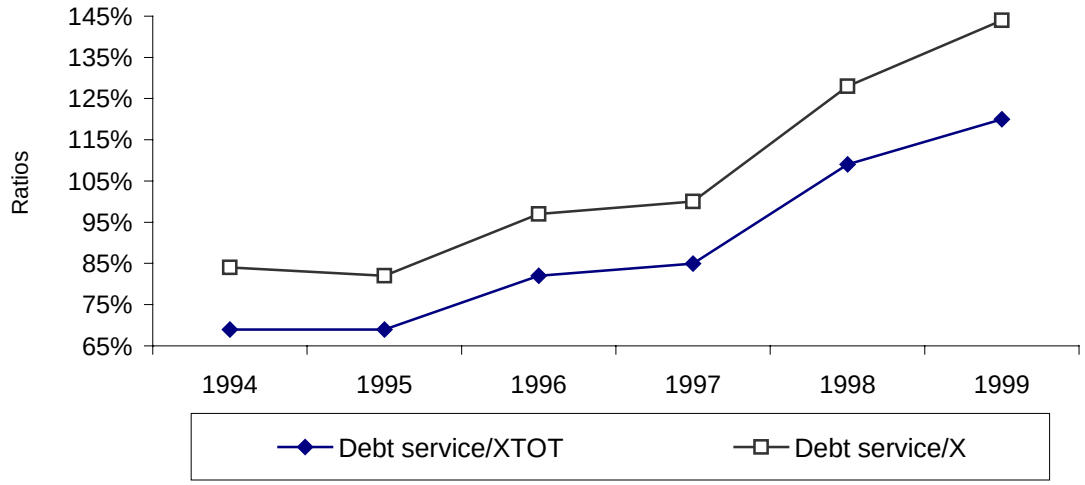
account deficit (absolute values) + debt service over international reserves held by the Central Bank (LVRR), and between debt service burden and the same reserves (LVR2R) [14]. Finally, Figure 9 describes external debt to GDP ratio performance considering total, national public sector, and net (of external assets) figures.

Figure 5. **Debt Service Ratios (1)**



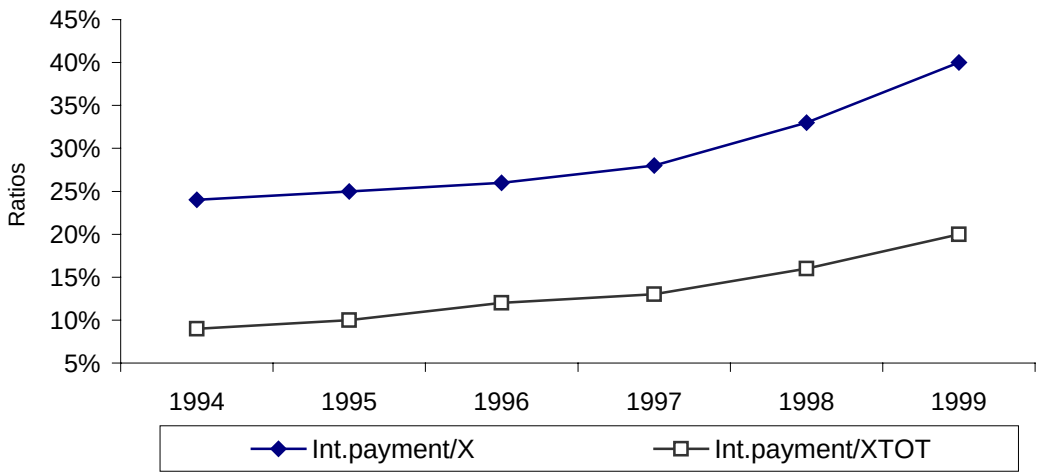
Source: Ministry of Economy, Argentina.

Figure 6. **Debt Service Ratios (2)**



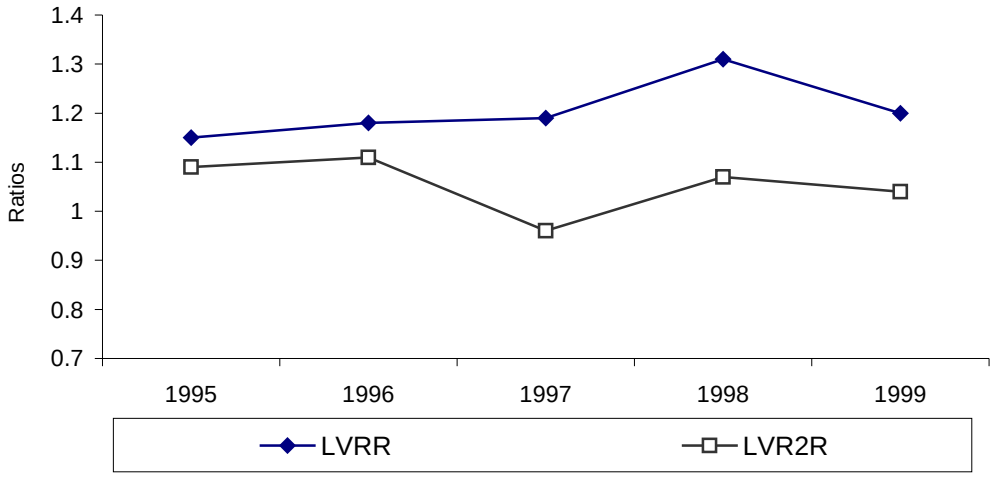
Source: Ministry of Economy, Argentina.

Figure 7. **Debt Service Ratios (3)**



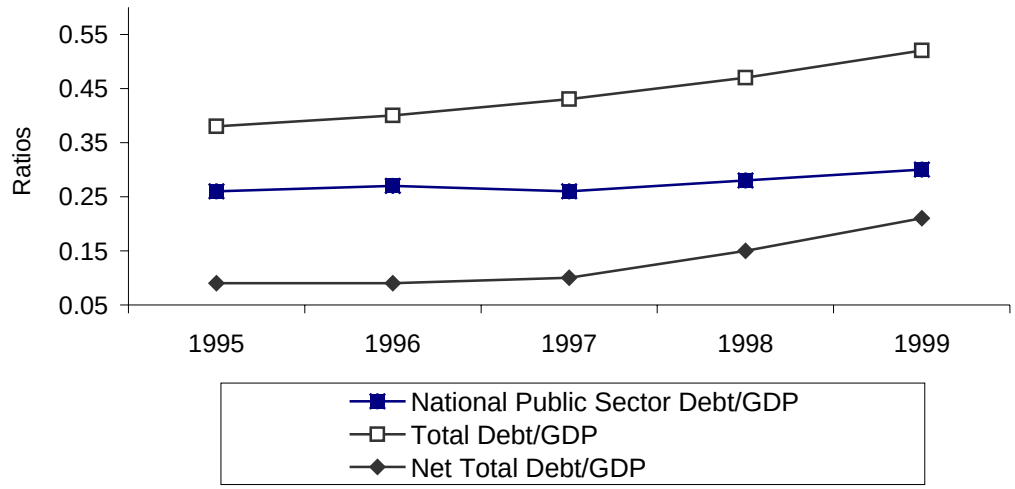
Source: Ministry of Economy, Argentina.

Figure 8. **Lehman Brothers Modified Liquidity Indicators**



Source: Ministry of Economy, Argentina.

Figure 9. **External Debt Ratios**



Source: Ministry of Economy, Argentina.

The figures above make a clear point: the external vulnerability profile for Argentina worsened continually during the last four years of the Menem administration. Except for the LB modified indicator, all the others have a clear-cut upward trend until 1999, either for a higher growth in debt stocks/services variables or a slower pace in GDP/X values. It is worth noting that the fiscal deficit was closely related to debt service burden, as much of the increase in public deficit (from almost 1 per cent of GDP in 1994 to nearly 2.5 per cent in 1999, Figure 10 below) was caused by higher interest payments.

The rest of this section will explore whether dollarisation could bring a meaningful reduction in external vulnerability, thereby leaving investment grade doors open.

On the one hand, the "optimistic" view suggests that dollarisation would reduce volatility (according to Frankel, 1999, Panama's case supports that hypothesis), increase credibility (if a monetary agreement with the US is arranged) and improve fiscal performance, due to lower interest rates on sovereign debt. These improvements would result in a virtuous circle with higher output growth and employment rates, better expectations, and less country risk. If debt stocks were rolled over at a constant rate and debt service decreased thanks to lower spreads — because of the disappearance of currency risk — the virtuous circle could start working out the vulnerability problem. In other words, real interest rates lower than GDP growth would be expected.

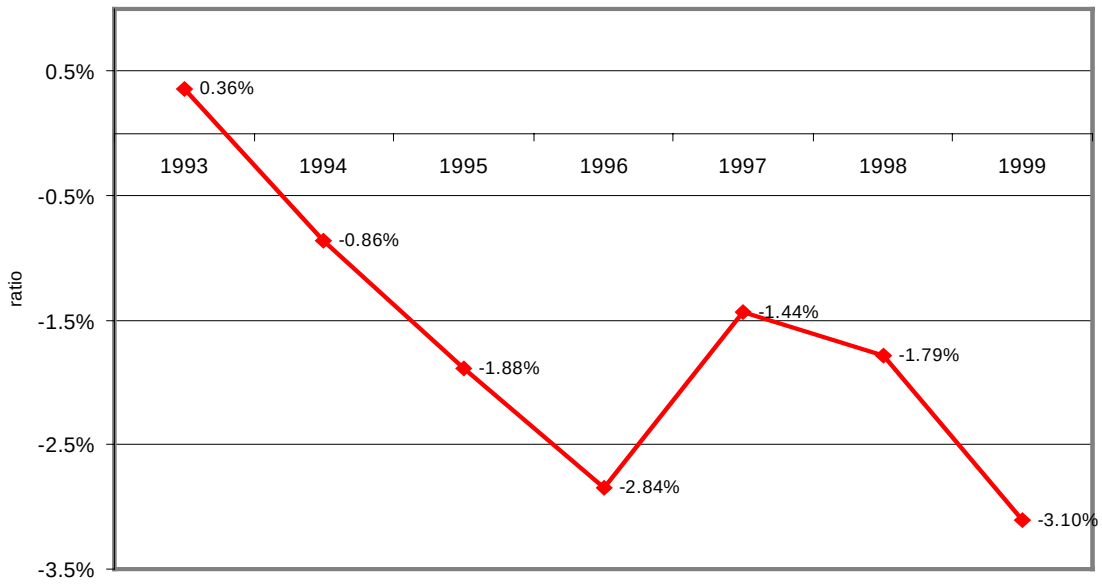
The "pessimistic" view, by contrast, focuses on competitiveness and the need to promote an export-led growth strategy in order to address vulnerability. Supporters of this view favour further labour market flexibility, horizontal incentives to external sales and the completion of so-called structural reforms (including labour market reforms). While they do agree on the impact of reducing spreads over real variables[15], they stress the fact that we can not expect a large reduction in country risk from eliminating currency risk (as we saw in Section III).

Even after substantially diminishing interest rates on sovereign peso-denominated bonds, three controversial issues remain. First, most of the Argentine external debt is dollar

or Euro denominated (see Section III). Second, small and medium companies do not have access to credit markets due to severe failures like information asymmetry (agency problems) or monitoring costs. Therefore, lessening financial costs would not affect the entire private sector, meaning that the prospect for employment and output growth could be less encouraging than expected. Thirdly, whereas dollarisation might reduce debt servicing and tighten government's budget — provided no seignorage revenues from international reserves were available — it would not necessarily eliminate brinkmanship with high discount rates or moral hazard behaviour on the part of politicians. So fiscal problems would not disappear with dollarisation (Eichengreen, 2000; Molano, 2000). Furthermore, neither theory nor evidence suggests that dollarising alone might foster structural reforms (Eichengreen, 2000). According to Goldfajn (2000), the full dollarisation regime was not able by itself to generate fiscal discipline in Panama, and other structural reforms carried out can hardly be linked to positive effects of this regime.

Argentina, with the current currency-board system (and a broad "*de facto* dollarisation") has been no exception, as Figure 10 clearly depicts.

Figure 10. **Fiscal Deficit in GDP**
(percentage)



In this author's opinion, the rating agencies' view on dollarisation is closer to the pessimistic version. A report about Argentina, released by S&P in September 1999 confirms this view:

> "Standard & Poor's is of the view that full dollarisation in Argentina, by itself, would not improve creditworthiness as long as there is no progress toward overcoming the main constraining factors on the country's creditworthiness, as identified in this report".

(They mention external vulnerability and fiscal deficit as the main factors).

The following conclusions can be drawn from Section IV:

— External vulnerability, the choice of exchange-rate regime and fiscal solvency are the principal factors affecting sovereign ratings assignments. In Argentina, those indicators clearly worsened during the second term of the former administration (President Menem).

— Improving Argentina's vulnerability profile would likely diminish currency risk, thus reducing ê (expected devaluation rate) and holding the domestic interest rate down. Meanwhile the country risk premium would also catch up to investment-grade values (thus affecting dollar-denominated bonds).

— When assessing the Argentine outlook, sovereign-rating agencies do not seem to consider dollarisation as the best way to reach the desired investment grade. By contrast, they insist on indicators of external vulnerability, competitiveness or structural reforms.

V. FISCAL SOLVENCY, GROWTH AND SOVEREIGN RISK

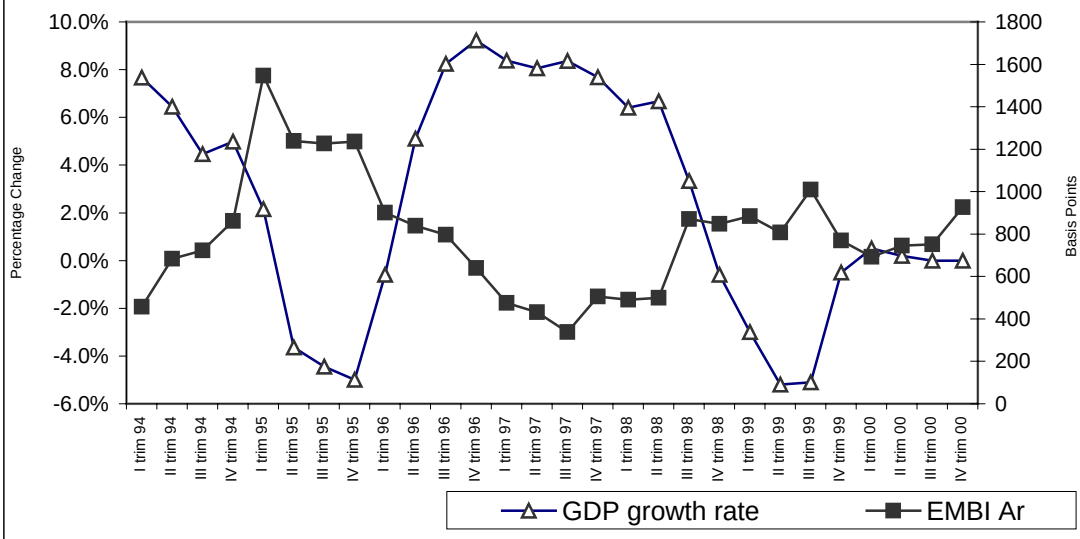
This section makes the case for the existence of a relevant endogeneity between fiscal deficit, GDP growth and bond spreads for the Argentine case, using time series econometric techniques. The results provide evidence supporting the hypothesis of an inverse relationship between them, especially regarding the country risk-growth expectations link. Such a finding might support non-trivial policy orientations targeting external vulnerability if positive shocks affecting one of those variables can trigger a virtuous circle of increasing growth, lower spreads, lower deficits and so on. According to the evidence presented in Sections III and IV, this circle, if sustainable, could modify rating agencies and investors' perceptions, resulting in a lower default risk for Argentina

In an open economy with highly mobile capital flows, the equilibrium path of GDP growth is closely linked to intertemporal solvency conditions. In other words, the debt stock — in turn driven by the primary fiscal deficit and debt service — should not increase at a higher rate than GDP, and as a counterpart, today's current account deficits (growing net foreign liabilities) should turn into future surplus.

Most of the economic policies adopted by Argentina's government, which took office in December 1999, are focused on tightening the fiscal deficit as a measure to limit debt burden. The underlying idea might be expressed as *"contractive fiscal policy does not always lead to lower output levels"*. As Rodriguez (1999) mentioned, in a non-Keynesian static open economy, reducing fiscal deficit can be expansive if the expectations of decreasing debt burden and stronger solvency tend to diminish sovereign spreads, in turn lowering interest rates[16]. This would contribute to a better output growth environment, hence counteracting Keynesian multiplier effects.

Some literature has dealt with the relationship between country risk and output growth, (see, for example, Avila, 1997; Rodriguez, 1999; or Nogues and Grandes, 1999[17]). Figure 11 elucidates the co-movements between those variables, using quarterly and newly updated data (to December 1999).

Figure 11. **Country Risk and Interannual GDP Growth Rate**



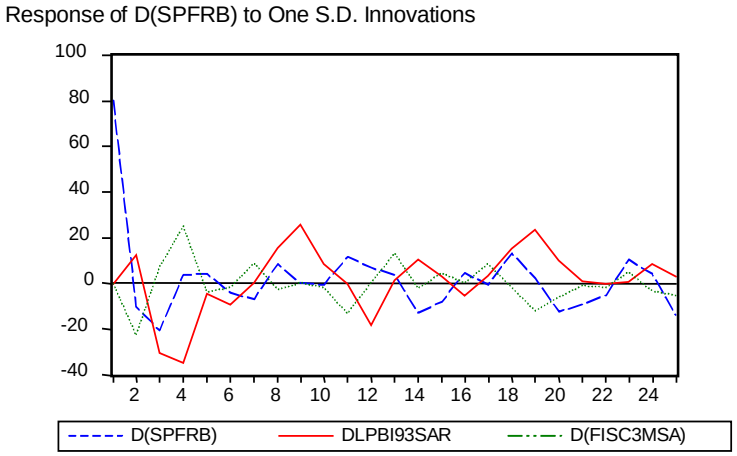
Source: Ministry of Economy, Argentina.

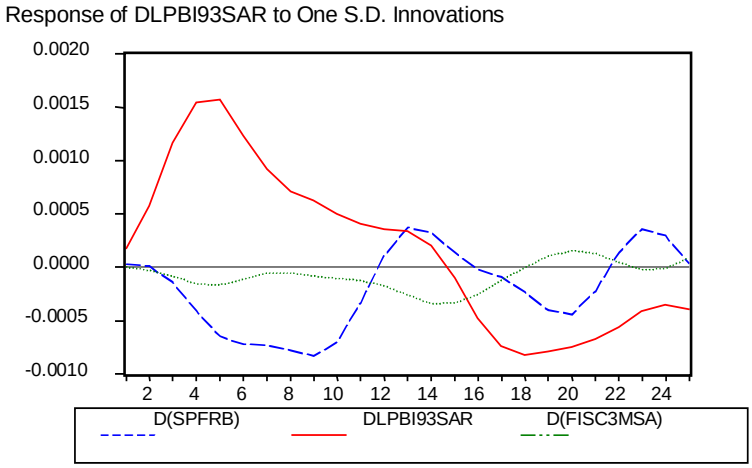
When fiscal deficit is considered, endogeneity problems appear once again. As output growth affects tax collection, fiscal tightening generates better growth expectations, which may turn out to be in superior output levels. On the other hand, lower country risk means lower future debt-service burden (assuming a permanent change), but, *ceteris paribus*, this will improve vulnerability ratios by fostering growth expectations.

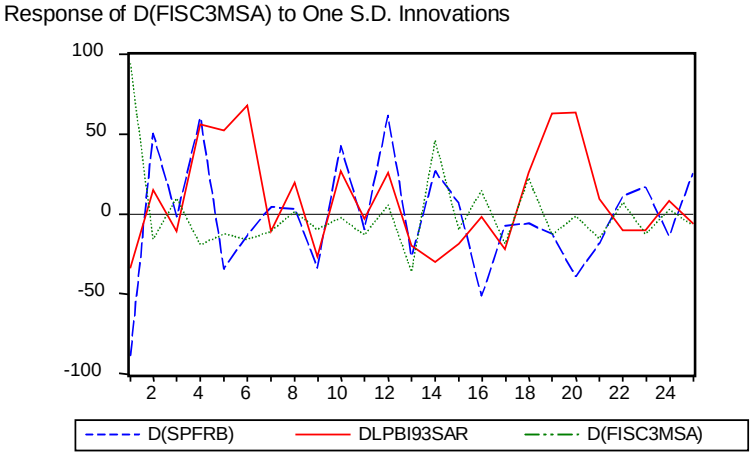
In order to account for endogenous variables in a time series framework, we can estimate a VAR (Vector Autorregressive Regression) for country risk (SPFRB), seasonally adjusted fiscal deficit (three-month accumulated, FISC3MSA) and seasonally adjusted output growth rate (DLPBI93SAR). All of these have a monthly frequency[18]. As explained in the appendix, SPFRB and FISC3MSA are taken in first difference for stability purposes. Otherwise, the variables' time path would not have been stable, thereafter diverging from stationary values.

Within this framework (see econometric appendix for further details concerning estimation procedures, assumptions, etc.), a shock is simulated in each variable to assess the response along a bounded horizon. This method attempts to shed some light on the virtuous circle dynamics mentioned above. The variable's time-paths beginning when the shock takes place are represented by the "impulse-response functions" depicted in Figure 12.

Figure 12. **Impulses Responses**







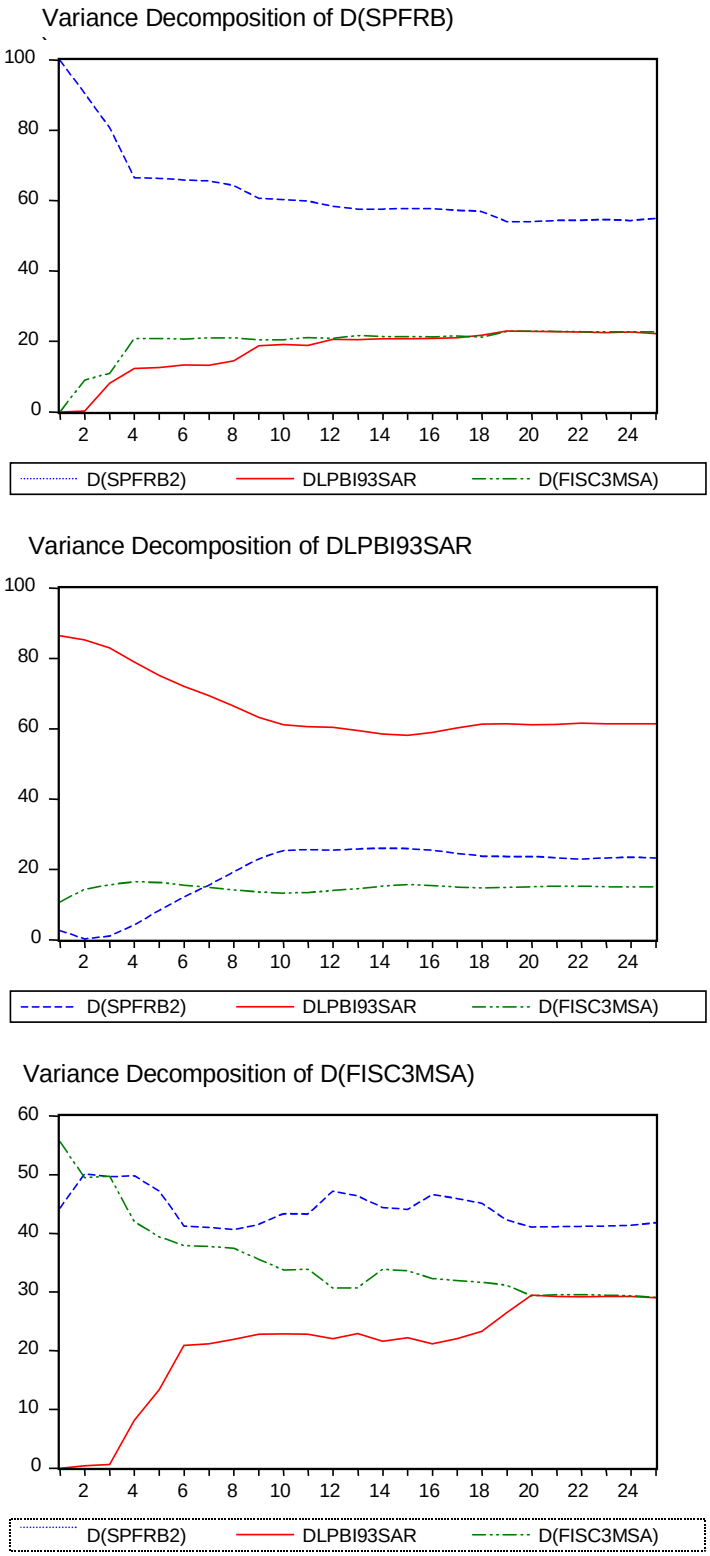
The first picture (top) describes the time path of sovereign risk variations after several shocks occur. As expected, a self-shock increases D(SPFRB) sharply during the first two months, then converges with smaller rises. On the other side, a one standard deviation increase in DLPBI93SAR causes D(SPFRB) to diminish until the 7th month. Later D(SPFRB) follows a discontinuous path mixing ups and downs, moving slowly to a stationary state. The response to a shock in D(FISC3MSA) is not so clear, as it goes down till the 3rd month but then increases over the following four months.

The second figure (middle) reflects responses of DLPBI93SAR to one standard deviations in all variables. Clearly, a shock on its own increases growth expectations between 0.05 and 0.15 per cent monthly during the first year after the shock takes place. After the 14th month it begins decreasing but not as pronouncedly as during the previous span[19]. On the D(SPFRB) side, a strong inverse relationship appears again, with drops around 0.05 per cent on DLPBI93SAR during the first year. Finally, a slight decrease in growth expectations prevails due to a shock in D(FISC3MSA) (reducing fiscal deficit) until the 14th month at which point the sign then reverses.

Lastly, D(FISC3MSA) responses to shocks in all variables trace an erratic trajectory. Perhaps the clearest are described by the impact of DLPBI93SAR and D(SPFRB), which often generate increases in D(FISC3MSA) (a lower deficit). However, this is not the case when assessing a shock on its own. Despite rising over the first two months, D(FISC3MSA) slightly diminishes thereafter[20].

With the former, an important endogeneity has been proven between fiscal deficit, GDP growth and bond spreads for the Argentine case, particularly the last two. This can be also seen through the forecast variance decomposition (Figure 13), which shows that the other variables explain 40 to 60 per cent of each variable variance, more strongly evidenced by fiscal deficit.

Figure 13. **Variance Decomposition**



VI. CONCLUDING REMARKS

This paper has explored whether dollarising Argentina's economy would make sense when addressing external solvency performance, investment grade targeting and the likely fall of country risk assumed to follow dollarisation.

After disentangling the components of local currency-denominated bond interest rates, showing how country risk is included, and examining the arguments upon which it depends (willingness and ability to pay), the Argentine case was empirically analysed, stressing that there is no accurate fashion to compute currency risk. It was argued that as both country and currency risk may hinge on the same arguments, it becomes difficult to calculate — either through econometric or probabilistic approaches — to what extent peso-denominated bond rates would lower thanks to currency risk disappearance. This finding is significant in that it counters literature on the subject that emphasises spreads reduction as one of the most valuable benefits of dollarising. Moreover, the fact that the lowest share of Argentina's external debt is peso-denominated — mainly consisting of short-term commitments — further binds potential gains, credibility effects aside.

Section IV examined some vulnerability indicators to ascertain why Argentina might still be rated at speculative grade, and also looked into agencies' reports to examine their reasoning. Two basic conjectures frame the analysis: *i)* sovereign ratings affect bond pricing (spreads)[21] through investors' decisions. Agencies in turn receive new information about country performance — information that continues to shape expectations; *ii)* external vulnerability and fiscal solvency are among the most important issues considered by agencies when assessing ratings, particularly for economies adopting fixed exchange regimes.

The figures show worsening of most indicators during 1995-99. However, ratings agencies and bond markets do not seem to be looking at dollarisation as a step towards investment grade. By contrast, they insist on competitiveness, fiscal adjustment and structural reform completion. On this ground, Argentina's vulnerability profile would be improved not only by reducing its debt-service burden but also through fostering an export take off. Meanwhile, it is possible that fiscal tightening, together with better growth expectations, can create a virtuous circle of lower spreads-higher output growth, as was empirically demonstrated in Section V. Yet it remains doubtful whether dollarisation itself could push forward structural reforms in order to induce that circle. The evidence from Panama's and Argentina's currency boards — very hard pegs — suggests that fiscal discipline cannot be equated with the soaring credibility that such regimes are supposed to engender. In addition, systemic risks will still be there though dollarisation gives the appearance of providing a full straightjacket.

These findings do not necessarily mean that sovereign ratings are right, and that dollarisation would not bring about progress towards investment grade. The message is that dollarising by itself would not lead to Argentina's paying a lower interest rate and working out its external/fiscal solvency problems. Other policies (e.g. export driven) might be necessary to ensure the "virtuous circle".

ECONOMETRIC APPENDIX

Var regression in Section V was calculated according to Enders (1995):

1) Stationary vs. Non-stationary Variables

Despite not being indispensable for some authors (for example Sims, 1980) emphasising the economic essence of data, it was thought worthwhile to examine stationarity for stability purposes. If not all the variables are I(0), there could be stability problems as one or more of a system's roots might lie outside the unit circle. When doing the typical ADF tests (excluding the determinist trend null hypothesis for economic reasons), it was found that all variables but DLPBI93SAR were I(1). Briefly, for each variable Y_t the following regression was run, testing the null hypothesis of $\gamma = 0$,

$$\Delta Y_t = \alpha + \gamma Y_{t-1} + \sum_{j=1}^{n} \Delta Y_{t-1} + \varepsilon_t$$

Variable	Optimal Lags	$H_0: \gamma = 0$; τ value	Critical Value 5%
SPFRB	2	-2.77	-2.91
FISC3MSA	3	-0.559	-2.91
DLPBI93SAR	1	-4.98	-2.91

Then, FISC3MSA and SPFRB were taken in first differences.

2) Overparametrization and Lag Length

To correctly specify the structural model (the EVIEWS 3.1 estimates the reduced form), there is a trade-off between overparametrization and serial correlation. The more lags that are added the less residuals will be correlated, but this will result in fewer degrees of freedom for hypothesis testing. The present case started by taking 12 lags. Using the same sample range, we used the Akaike Information Criteria (the lowest) to test which model fit better (exactly 12).

3) Regression Output

OLS VAR regression was run with the following output:

Adjusted Sample: 1995:04 1999:12
Included observations: 57
Standard errors & t-statistics in parentheses

	D(SPFRB2)	DLPBI93SAR	D(FISC3MSA)
D(SPFRB2(-1))	-0.406767	-1.38E-06	0.424419
	(0.23463)	(5.2E-07)	(0.38966)
	(-1.73366)	(-2.66212)	(1.08920)
D(SPFRB2(-2))	-0.140520	-1.10E-06	0.428389
	(0.20393)	(4.5E-07)	(0.33867)
	(-0.68908)	(-2.43841)	(1.26491)
D(SPFRB2(-3))	0.172397	7.21E-07	0.549483
	(0.22435)	(5.0E-07)	(0.37259)
	(0.76843)	(1.45151)	(1.47477)
D(SPFRB2(-4))	-0.173582	9.94E-08	-0.126901
	(0.21386)	(4.7E-07)	(0.35518)
	(-0.81165)	(0.20992)	(-0.35729)
D(SPFRB2(-5))	-0.303397	-7.62E-07	0.135939
	(0.20049)	(4.4E-07)	(0.33297)
	(-1.51327)	(-1.71503)	(0.40827)
D(SPFRB2(-6))	-0.267354	-1.71E-06	0.653427
	(0.18993)	(4.2E-07)	(0.31542)
	(-1.40768)	(-4.05348)	(2.07160)
D(SPFRB2(-7))	0.062489	2.74E-08	0.638026
	(0.24873)	(5.5E-07)	(0.41308)
	(0.25123)	(0.04972)	(1.54455)
D(SPFRB2(-8))	-0.053945	1.43E-06	-0.275444
	(0.24612)	(5.5E-07)	(0.40874)
	(-0.21918)	(2.61695)	(-0.67388)
D(SPFRB2(-9))	-0.314514	-8.19E-07	0.747010
	(0.25997)	(5.8E-07)	(0.43175)
	(-1.20982)	(-1.42279)	(1.73020)

D(SPFRB2(-10))	0.209296	4.88E-07	0.830281
	(0.25718)	(5.7E-07)	(0.42712)
	(0.81380)	(0.85652)	(1.94390)
D(SPFRB2(-11))	0.387557	2.68E-07	1.314511
	(0.24488)	(5.4E-07)	(0.40669)
	(1.58264)	(0.49333)	(3.23224)
D(SPFRB2(-12))	0.510224	7.93E-07	-0.319602
	(0.29679)	(6.6E-07)	(0.49289)
	(1.71916)	(1.20573)	(-0.64842)
DLPBI93SAR(-1)	24061.34	3.215502	52865.54
	(81027.5)	(0.17949)	(134567.)
	(0.29695)	(17.9147)	(0.39286)
DLPBI93SAR(-2)	-213113.4	-3.804096	-213222.5
	(259595.)	(0.57505)	(431126.)
	(-0.82095)	(-6.61530)	(-0.49457)
DLPBI93SAR(-3)	313164.8	-0.291582	664215.2
	(370088.)	(0.81981)	(614629.)
	(0.84619)	(-0.35567)	(1.08068)
DLPBI93SAR(-4)	104708.5	6.545385	-752257.8
	(395269.)	(0.87559)	(656449.)
	(0.26490)	(7.47542)	(-1.14595)
DLPBI93SAR(-5)	-730064.9	-7.700279	-15677.04
	(533200.)	(1.18113)	(885520.)
	(-1.36921)	(-6.51943)	(-0.01770)
DLPBI93SAR(-6)	719848.7	1.209491	806592.4
	(555267.)	(1.23001)	(922168.)
	(1.29640)	(0.98332)	(0.87467)
DLPBI93SAR(-7)	84007.92	6.013583	-537623.2
	(560114.)	(1.24074)	(930217.)
	(0.14998)	(4.84676)	(-0.57795)
DLPBI93SAR(-8)	-705988.1	-6.281299	-422893.3
	(518454.)	(1.14846)	(861030.)
	(-1.36172)	(-5.46932)	(-0.49115)

DLPBI93SAR(-9)	395871.4	1.036278	805009.7
	(367019.)	(0.81301)	(609531.)
	(1.07861)	(1.27462)	(1.32070)
DLPBI93SAR(-10)	232926.4	2.725490	-238806.3
	(390673.)	(0.86540)	(648815.)
	(0.59622)	(3.14938)	(-0.36807)
DLPBI93SAR(-11)	-337749.0	-2.334837	-274071.0
	(283565.)	(0.62814)	(470934.)
	(-1.19108)	(-3.71705)	(-0.58197)
DLPBI93SAR(-12)	115456.6	0.659554	191108.3
	(87961.1)	(0.19485)	(146083.)
	(1.31259)	(3.38496)	(1.30822)
D(FISC3MSA(-1))	-0.243015	-3.29E-07	-0.166807
	(0.13117)	(2.9E-07)	(0.21784)
	(-1.85270)	(-1.13150)	(-0.76573)
D(FISC3MSA(-2))	-0.053508	-2.69E-07	0.199325
	(0.08896)	(2.0E-07)	(0.14774)
	(-0.60149)	(-1.36307)	(1.34916)
D(FISC3MSA(-3))	0.233784	-1.01E-07	-0.104949
	(0.08772)	(1.9E-07)	(0.14568)
	(2.66513)	(-0.52060)	(-0.72040)
D(FISC3MSA(-4))	0.061496	5.44E-07	-0.112788
	(0.09374)	(2.1E-07)	(0.15569)
	(0.65601)	(2.61840)	(-0.72446)
D(FISC3MSA(-5))	-0.099170	1.99E-07	-0.222927
	(0.09561)	(2.1E-07)	(0.15878)
	(-1.03726)	(0.94098)	(-1.40398)
D(FISC3MSA(-6))	-0.014345	-9.31E-07	-0.147502
	(0.10859)	(2.4E-07)	(0.18034)
	(-0.13211)	(-3.86914)	(-0.81793)
D(FISC3MSA(-7))	0.075261	1.19E-08	0.106568
	(0.10091)	(2.2E-07)	(0.16758)
	(0.74585)	(0.05318)	(0.63592)
D(FISC3MSA(-8))	0.086604	6.67E-07	-0.151276
	(0.10087)	(2.2E-07)	(0.16752)
	(0.85860)	(2.98307)	(-0.90306)

D(FISC3MSA(-9))	-0.015523	-1.05E-07	-0.411582
	(0.09562)	(2.1E-07)	(0.15880)
	(-0.16234)	(-0.49655)	(-2.59187)
D(FISC3MSA(-10))	-0.173962	-3.00E-07	0.039727
	(0.08898)	(2.0E-07)	(0.14777)
	(-1.95514)	(-1.52376)	(0.26885)
D(FISC3MSA(-11))	-0.010190	-3.66E-07	0.277448
	(0.08158)	(1.8E-07)	(0.13548)
	(-0.12491)	(-2.02634)	(2.04786)
D(FISC3MSA(-12))	0.232837	6.16E-08	-0.301308
	(0.09096)	(2.0E-07)	(0.15106)
	(2.55983)	(0.30565)	(-1.99463)
C	-19.79524	-1.61E-05	-219.1331
	(39.9954)	(8.9E-05)	(66.4229)
	(-0.49494)	(-0.18136)	(-3.29906)
R-squared	0.679679	0.998836	0.862349
Adj. R-squared	0.103102	0.996739	0.614578
Sum sq. resids	365935.7	1.80E-06	1009301.
S.E. equation	135.2656	0.000300	224.6443
F-statistic	1.178817	476.5301	3.480425
Log likelihood	-330.7436	411.4069	-359.6584
Akaike AIC	12.90328	-13.13708	13.91784
Schwarz SC	14.22948	-11.81089	15.24403
Mean dependent	-18.11579	0.002752	-42.43782
S.D. dependent	142.8288	0.005247	361.8488
Determinant Residual Covariance		1.722317	
Log Likelihood		-258.1331	
Akaike Information Criteria		12.95204	
Schwarz Criteria		16.93061	

4) Impulse-Response Functions/Choleski Decomposition: How to Recognise Structural Shocks

When Eviews runs OLS VARs it does so in the reduced form, say:

$$X_t = A_0 + A_j X_{t-j} + e_t$$

where j is the optimum lags number for endogenous variables X (chosen by information criteria — as this case proved — or likelihood ratio tests, a much better fit for large samples), A_0 is the constant vector, A_j represents the parameters matrix, and e_t are random shocks or forecast error terms. While obtaining impulse-response functions, one is simulating a shock in e_t but aiming at figuring original innovations or structural shocks, namely ε_t, in the following structural system[22]:

$$X_t = B_0 + B_1 X_t + B_j X_{t-j} + \varepsilon_t$$

Indeed, e_t are composites of the underlying shocks ε_t. In a first order VAR of two endogenous variables (Y, Z), the relationship between these would be:

$$e_{1t} = 1/(1-b_{12}\, b_{21})\, \varepsilon_{yt} + (-b_{12}/(1-b_{12}\, b_{21}))\, \varepsilon_{zt}$$
$$e_{2t} = -\, b_{21}/(1-b_{12}\, b_{21})\, \varepsilon_{yt} + 1/(1-b_{12}\, b_{21})\, \varepsilon_{zt}$$

where b_{12} and b_{21} are the contemporaneous cross coefficients between Y and Z. Although these composite shocks are the one step ahead forecast errors in such variables, they do not have a structural interpretation. Hence, there is an important difference between using VARs for forecasting and using them for economic analysis (as this paper does). If forecasting is the only purpose, the components of the errors are unimportant. If an impulse response function or a variance decomposition is the objective, calculating/estimating the effects of an innovation in Y or Z necessitates the use of structural shocks (i.e. ε_{yt}, ε_{zt}), and not forecast errors.

However, to identify structural innovations it is indispensable to use decomposition. In this case, the one given by Eviews was employed (Choleski)[23]. For that purpose, a certain ordering of the variables is also required, especially when the correlation coefficient among e_t is significant (as a rule of the thumb, higher than 0.2 or 0.25). In other words, it must be supposed that some variables do not have a contemporaneous effect on others. The assumption could be or not *ad hoc*, otherwise giving an economic reason to explain it.

Regarding the impulse-response functions performed in Section V, no contemporaneous effects from D(SPFRB) to DLPBI93SAR and D(FISC3MSA), nor from DLPBI93SAR to D(FISC3MSA) were assumed. Expressed differently, the following ordering applies:

d(spfrb) ⟶ dlpbi93sar ⟶ d(fisc3msa)

This is supported by the error correlation matrix below, which shows a meaningful coefficient only between D(FISC3MSA) and D(SPFRB). Notwithstanding, this relationship is

more likely to result in reducing fiscal deficit on bond spreads than the inverse, at least contemporaneously. This makes sense only if it is thought that lower spreads “today” lead to lower interest payments “tomorrow”, as new debt contracts are settled, decreasing fiscal burden. For the rest, the ordering seems not to matter.

	D(SPFRB)	DLPBI93SAR	D(FISC3MSA)
D(SPFRB)	1	0.1635	-0.6656
DLPBI93SAR	0.1635	1	-0.3558
D(FISC3MSA)	-0.6656	-0.3558	1

5) Variance Decomposition

The forecast error variance decomposition gives the proportion of movements in a sequence due to its “own” shocks versus shocks in another variable. If, say, a shock on X explains none of the forecast error variance of Y at all forecast horizons, it can be said that the Y sequence is exogenous. The estimates examined here raised a great deal of endogeinity, (Figure 12, Section V).

NOTES

1. Despite the fact that most of them have subscribed to the monetary agreement option (with USA, of course), economists like Kurt Schuler have suggested implementing a unilateral version.

2. If the covered interest parity was considered, then $I = I^* + FD + \rho$ (.). In this case, investors would cover themselves in the forward market**.**

3. Strictly speaking, the sovereign risk premia could be divided into a pure default risk (willingness to pay) plus the transfer risk (ability to pay, given contingent capital controls or other restrictions imposed to foreign currency markets).

4. In fact, over the last four or five years, there was an inflation differential of around 2 per cent between Argentina and the USA.

5. By contrast, it is not intended to check the hypothesis of highly mobile capital or national savings-investment correlation, as Frankel does by means of interest parity theorem.

6. These bonds, better known as “Bocones” in Argentina, represented a compulsory consolidation of former debts with pensioners.

7. There, a brief discussion addressed not only the use of PRE1 and PRE2 bonds but also different ways of measuring sovereign spreads (Brady’s re-scheduling debt programme as FRB — floating rate bonds — or PAR — fixed rate bond — EMBI + index, etc.).

8. The PAR bonds belong to Brady´s Refinancing Program of the Argentine Debt, dating from 1992/3, and yield a fixed return, unlike the FRB.

9. Ratings were modified to S&P scale to facilitate the comparison.

10. Now in office.

11. However, much of the promising initial conditions fade away and the year-end political crisis together with the fear of default — given insufficient economic growth — induce S&P to decide a downgrade.

12. In its report, Moody’s highlighted the lower foreign currency debt burden underpinned by a dynamic export sector well integrated into the North American economy…, the increasing share of FDI or non-speculative capital flows in current account deficits cover, a flexible exchange rate policy which has reduced the call on international reserves — resulting in a much less vulnerable external payments position — as well as appropriate macroeconomic policies targeted to prevent contingent crises.

13. Nevertheless, soon after the ongoing administration took office others claimed that the agreement with IMF, fiscal responsibility laws, labour reform, terms of trade trend reversion and Brazil’s growth recovery, might have been factors contributing to a further positive revision. The story then went in the opposite sense.

14. Including liquidity requirements made on foreign banks.

15. Nor do we mean the optimistic do not share the structural reform view, but that they tend to emphasise another sequencing.

16. Here there is the implicit assumption of a highly external fund supply elasticity.

17. From those contributions arises a strong tested empirical connection between country risk and real variables performance for the Argentine case. Although Avila (1997) and Rodriguez (1999) consider country risk as an explanatory variable, Nogues and Grandes (1999) take the growth expectations in a perfect foresight setting to account for variations in spreads, with a monthly frequency series. This finding indicates an endogeneity problem.

18. DLPBI93SAR has been turned into a monthly series through the Mat Lab 4.0 program.
19. Indeed, we are mostly interested in the responses over the first year because a longer horizon could imply other changes not foretold by the original model.
20. Despite that, we saw that during the first year after the shock in d(fisc3msa), dlpbi93sar slightly diminishes, the net effect of deeming a simultaneous shock could still be favourable.
21. It should be remembered that the opposite may be true. In fact, it is an iterative process.
22. Because this could be economically meaningful. For a discussion of the atheoretical basis of VARs, see Enders (1995) for an extended analysis.
23. Other decomposition methods can be devised (e.g. Bernanke and Sims, 1986; see Enders 1995).

BIBLIOGRAPHY

AVILA, J. (1998), “Riesgo Argentino y Ciclo Económico", Universidad del Cema.

BARRO, R. (1999), “Let the Dollar Reign from Seattle to Santiago”, *Wall Street Journal,* March.

BERG A. and E. BORENZSTEIN (2000), “The Pros and Cons of Full Dollarisation”, IMF Working Paper 50. Available at: http://www.imf.org.

BERG, A. and C. PATILLO (1999), “Are Currency Crises Predictable? A Test”, *IMF Staff Papers* Vol. 46, No. 2, June.

CALVO, G. (1999), “On Dollarisation”, University of Maryland. Available at: http://www.bsos.umd.edu/econ/ciecalvo.htm.

CALVO, G. (2000), “Capital Markets and The Exchange Rate, With Special Reference to the Dollarization Debate in Latin America”. Available at: http://www.bsos.umd.edu/econ/ciecalvo.htm

CANTOR, R. and F. PACKER (1996), “Determinants and Impact of Sovereign Credit Ratings”, FRBNY *Economic Policy Review*, October.

EICHENGREEN, B. (1998), “Does Mercosur Need a Single Currency?”, *NBER Working Paper* 6821.

EICHENGREEN, B. (2000), “When to Dollarize”, University of California, Berkeley, Conference on dollarisation, Federal Reserve Bank, Dallas. Available at.http://www.dallasfed.org. February.

ENDERS, W. (1995), “Applied Econometric Time Series”, Wiley Series.

ESCUDE, G., E.M. GRUBISIC and V. COHEN (2000), “The Effect of Risk Aversion in the Evaluation of the Default Risk Reduction Due to Full Dollarization”, Comments on “The Pros and Cons of Full Dollarization”, by BERG and BORENSZTEIN. Technical Note 7, BCRA. Available at http://www.bcra.gov.ar.

FRANKEL, J. (1989), “Quantifying International Capital Mobility in the 1980s”, *NBER Working Paper* No. 2856, February.

FRANKEL, J. (1999), “No Single Currency Regime is Right for all Countries or at all Times?”, *NBER Working Paper* No. 7338. Available at http://www.nber.org/papers.

HANKE, S. and K. SCHULER (1999), “A Dollarisation Blueprint for Argentina”, *Foreign Policy Briefing* No. 52. Cato Instituten, March.

HAQUE, N., N. MARK and D. MATHIESON (1998), "The Relative Importance of Political and Economic Variables in Creditworthiness Ratings", *IMF Working Paper* 46, April.

HAUSMANN, R. and A. POWELL (1999), “Dollarization: Issues of Implementation”, IADB, March.

KAMINSKY, G., S. LIZONDO and C. REINHART (1999), “Leading Indicators of Currency Crises”, IMF Staff Papers 51, March.

LARRAIN, G., H. REISEN and J. VON MALTZAN (1997), “Emerging Market Risk and Sovereign Credit Ratings”, OECD Development Centre Technical Paper No. 124, Paris.

LEHMAN BROTHERS (1999), “Emerging Markets Currency Crisis Vulnerability”, *Global Foreign Exchange Strategies*, November.

LEVY YEYATI, E. and F. STURZENEGGER (1999), “The Euro and Latin America III: Is EMU a Blueprint for Mercosur”, Business School, Torcuato Di Tella University. Available at http://www.utdt.edu. April.

MOLANO, W. (2000), “Addressing the Symptoms and Ignoring the Causes: A View from Wall Street on Dollarization”, Conference on Dollarisation, Federal Reserve Bank, Dallas. Available at http://www.dallasfed.org. March.

MOODY'S INVESTOR SERVICE, Various reports (1999 and 2000). Available at http://www.moody's.com.

NOGUES, J. (2000), "Economic Consequences of Publishing Revised Macroeconomic Accounts". Stanford University, forthcoming.

NOGUES, J. and M. GRANDES (1999), "Riesgo Pais: Politicas Economicas, Contagio o Ruido Politico?" Undersecretary of Macroeconomic Programming, Ministry of Economy, Argentina, November, forthcoming (2000), Journal of Applied Economics (english version).

REISEN, H. and J. Von Maltzan (1999), "Boom and Bust and Sovereign Ratings", OECD Development Centre Technical Paper No. 148, June.

RUBINSTEIN, G. (1999), "Dolarización. Argentina en la Aldea Global", Editorial Nuevo Hacer, Grupo Editor Latinoamericano.

STANDARD & POOR´S (2000), Sovereign Ratings Service, "Argentina: Regaining the Momentum for Structural Reform". Available at http://www.standardandPoor´s.com/ratings/. February.

STEIN, E., E. TALVI, U. PANIZA and G. MARQUEZ (1999), "Evaluando la Dolarizacion: Una Aplicacion a Paises de America Central y del Caribe", IADB, Panama, July.